ECONOMIC INTEGRATION AND THE INDUSTRIALISATION OF SMALL, DEVELOPING NATIONS: THE CASE OF CENTRAL AMERICA

by

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1. General Introduction and Synopsis

The thesis tries to test certain propositions about the applicability of "economic integration" to a group of small, poor countries, as a means of increasing the efficiency and scope of industrialisation. The Central American Common Market is used as a practical example of an integration scheme, for which these hypotheses can be tested.

The introductory chapter attempts to test the validity of the 'rationale' for integration as it has evolved with reference to developing countries in general and Latin America in particular.

First, the "traditional" or "static" customs union theory is rejected as irrelevant: its assumptions are inapplicable and empirical calculations indicate that gains or losses in static resource allocation terms are derisory. Second, the "dynamic" or non-traditional case for economic integration amongst poor countries is examined.

The case rests ultimately on a preference for greater emphasis on manufacturing rather than primary production. A theory of customs unions based on 'industry preference' has been built up by Cooper and Massell; Andic, Andic and Dosser, and others. Is this preference rational in a Central American context? It was found that commodity exports did not suffer from noticeably serious fluctuations or unfavourable income terms of trade, and that manufacturing has been inefficient

in utilising surplus labour, though the level of manufacturing was below "normal" for countries of that size and level, when multinational x-section regressions equations were analysed.

Given "industry preference", rational or otherwise, how should manufacturing be developed? It was considered that exporting to richer countries on a large scale was at best an uncertain prospect. And at least with the present distribution of income, the market for "traditional" manufactures was largely saturated by local production by 1960. This meant that intermediate and capital goods industry would have to be considered, to produce substitutes for overseas imports. Yet these industries tend to be subject to economies of scale and local markets are very small. Regionalisation can perform the crucial role of market enlargement.

A regional market, then, permits greater efficiency in import substituting industrialisation through economies of scale; permitting the establishment of plants that would otherwise have been below the technically minimum size, and the diffusion of 'external' dynamic effects. Calculations of the "normal" levels of manufacturing value added predicted by a joint market indicate that the level could be 20 per cent greater than for separate markets. A considerable volume of micro-economic data on economies of scale is also available which indicates the extent to which the necessary level of protection is reduced by a larger market.

However the rationale for economic integration which is evaluated in chapter 1 does not necessarily imply that the best <u>form</u> of integration is a customs union, but, rather, a selective and planned development of those sectors in which economies of scale are important. The second chapter tries to assess the development of the Central American Common Market in this respect, by way of a comparative qualitative comparison

of economic integration schemes. In particular, an attempt was made to evaluate the widely held belief that the Central American Common Market is (or was until its disruption) one of the most advanced and successful attempts at integration amongst developing countries. This success was largely confined to securing a tariff-free area (though not one perfectly so) and to modest progress in monetary integration and harmonisation of fiscal incentives. Very little however has been done to evolve joint planning, a common industrial policy, or a compensation mechanism; and in this respect the CACM looks less "advanced" than the "Andean group" or the Turkey-Pakistan-Iran grouping (R.C.D.). It is clear how this arose. The technocrats who promoted the integration concept wished to avoid conflict over political matters and over loss of sovereignty. They therefore took the line of least resistance.

In chapter 3 an attempt is made to quantify the gains and losses to member states from regional development rather than from development within national markets. The author's study is the first comprehensive attempt to calculate gains and losses in this context using a range of known methods; though there have been three or four published papers dealing with one or more aspects. The whole exercise of quantifying gain and loss is a difficult one: statistics are unreliable and there is a persistent 'identification problem'. A disaggregated analysis of trade flows and particularly of the local value-added content indicates that previous estimates of the contribution of the CACM (about $\frac{1}{7}$ of recorded regional growth over 1958-68) are substantiated. It was also felt on the basis of a detailed study of the external tariff that the "costs" of protection (i.e. trade "diversion") were far less significant than might be indicated by the nominal tariff. The most important specific hypothesis

which is tested (and which no other major study has looked at seriously) is the view that not all members of the Common Market have benefitted from membership, and would gain from withdrawal. The author's findings indicate that Honduras in particular can identify little gain. Much of its regional exporting would take place anyway. Much of its regional importing could be converted quite easily into industries using the national market. Its losses from customs duty remission on regional trade and "trade diversion" are proportionately great. Above all, the attractions of "growth pole" centres such as San Salvador and Guatemala have become cumulative.

The quantitative findings (chapter 3) and the qualitative observations (chapter 2) are now brought together (chapter 4). A 'laissez-faire' customs union arrangement may bring substantial gains in efficiency and an impetus to growth but an unequal distribution of gains easily develops and is cumulative. In addition, the author's analysis of firm and plant size in Central America tends to suggest that uncoordinated development has resulted in the establishment of manufacturing units of small scale, not only sub-optimal in size but with substantial duplication of capacity, and there is also evidence to suggest that large scale projects have been discouraged because of competing plans in partner countries. A further consequence of lack of planning has been that there have been very few "basic" industries, with much of the industrial development taking the form of plants with high effective protection and high "import content". There is then an evaluation of the instruments which a common market authority might introduce in these circumstances to cope with the misallocation of resources and the tendency to unequal gains. It was considered that some form of "investment policy", implying control by the regional authority over location, size, and ownership

of some important industrial sectors, was necessary. Previous experience however is not too encouraging: the Central American Integration Industries Scheme is not a proven success. Yet it is difficult to see how large scale industrial plants relying on the regional market are likely to develop in any other way; if a balanced distribution of returns is to be maintained.

Given the need for a "regional investment policy" how should it operate if we are to avoid the arbitrary and uneconomic allocation procedure that one would get from a 'package deal' divorced from economic criteria; or on the other extreme, an impossibly cumbersome framework of multinational planning? Models have been developed for establishing the costs of different sizes and location of plant on an industry basis and this could give us some estimate of the extent to which a 'regional' plant in a particular industry was preferable in cost terms to 'national' plants in various permutations, trading off economies of scale against diseconomies (notably transport costs). A static integer programming model has been used in several contexts similar to this, and an attempt is made to apply it here. Use was also made of a dynamic programming model showing the gains that might be derived by existing plants coordinating their time phasing of investment in new capacity in the future. The use of these models did not involve original work either in the model construction or the programming but the use of these techniques is new in the context of Central America, and seemed to the author not to stretch unreasonably the availability of data or practicability.

Using this approach, an attempt was made to do a detailed case study of two major industries which have been established in Central America, albeit on the basis of national rather than regional markets: cement

and petrol refining. It was calculated that delivered cost from the present given units (exclusive of tax and retail/wholesale margins) is of the order of 10 per cent higher than for an optimal distribution (one rather than six oil refineries and two rather than five cement plants), if we trade off transport costs against economies of scale, other things being equal. There are of course simplifying assumptions and sensitivity analysis to be applied. There are also problems of valuing private and social costs and benefits; and industries cannot be considered in isolation (e.g. the pattern of petroleum refining chosen precludes petrochemical development). The time phase model was also applied and costs of production in both industries could be reduced by 5-10 per cent by a judicious planning of capacity expansion.

Research needs to be done on a broader range of industries than that covered here and the author has tried to extend subsequently the analysis to cover industries like caustic soda, steel, plate glass and paper.

What the various case studies demonstrate is the gain from a planned development of the 'economies of scale industries', whose establishment is the basis for the integration rationale in the region, and which in the absence of some degree of control or planning are likely to be established either at sub-optimal sizes or locations, or in a manner that fails to give an equitable share to one or more states.

Whether or not the states will accept a degree of multinational pooling of sovereignty necessary to make a scheme of this kind work is questionable, and a function of political variables which are beyond the scope of the thesis. However it is certain that without such a sacrifice of sovereignty no integration scheme will survive anywhere for long.

Diagram Ia Macro economic aggregates in Central America

1. Gross National Product in 1966 Prices, 1950-70 (Millions of U.S. Dollars)

	1950	1955	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
LAFTA (Total)	49331												107,388.
CACM (Total)	1,851												4,730.
Costa Rica	258	373	468	469	500	528	546	593	631	669	721	776	799
El Salvador	385	480	583	608	688	713	764	801	845	880	912	940	968
Guatemala	711	795	1029	1072	1110	1215	1270	1327	1388	1438	1519	1598	1646
Honduras	255	332	429	430	449	460	485	516	536	556	583	602	620
Nicaragua	242	351	402	428	473	507	538	584	600	624	655	677	697

2. Per Capita Gross National Product in 1966 Prices, 1950-70 (U.S. Dollars)

	1950	1955	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
LAFTA(Average)	298	344	383	392	395	393	407	416	421	427	439	457	455
CACM(Average)	230	249	266	266	275	283	288	296	299	302	307	311	315
Costa Rica	300	363	373	361	372	380	379	398	409	420	437	454	467
El Salvador	207	225	238	241	264	265	275	278	284	286	286	285	293
Guatemala	253	240	263	265	266	281	284	288	292	293	300	306	315
Honduras	176	199	221	215	217	215	220	226	227	227	230	230	237
Nicaragua	228	287	285	295	316	329	337	353	350	352	354	355	365

3. Industrial Composition of Gross National Product in Constant Prices (1966=100), 1970 (Millions of U.S. Dollars)

	Agriculture	Mining	Manufacturing	Construction	Transport	Trade	Public Admin.	Total Product
LAFTA	21,595	5,743	25,310	4,454	8,120	19,687	22,459	107,388
CACM	1,376	24	742	143	270	1,151	1,020	4,730
Costa Rica	189	-	145	38	30	133	263	799
El Salvador	261	1	175	34	61	257	178	968
Guatemala	471	2	235	31	87	504	316	1,646
Honduras	249	11	89	23	45	97	105	620
Nicaragua	206	10	98	17	47	160	158	697

4. Growth Rates in Real Terms (1966=100), 1960-70 (Percentage per Year, Compounded)

	Agriculture	Mining	Manufacturing	Construction	Transport	Trade	Public Admin.	Total Product
LAFTA	4·0	3·4	4·6	4·6	5·0	4·6	5·3	4·6
CACM	3·9	5·5	6·4	5·0	5·0	5·5	4·8	5·0
Costa Rica	5·2	-	6·1	5·6	2·6	3·1	7·2	5·5
El Salvador	3·6	0	7·5	6·0	6·0	6·4	3·9	5·2
Guatemala	4·2	0	5·9	4·0	4·4	5·8	3·8	4·8
Honduras	2·7	10·7	5·5	4·3	5·6	4·6	2·8	3·7
Nicaragua	4·4	5·3	6·7	4·5	6·1	6·2	6·3	5·6

Source: United Nations (E.C.L.A.). Mexico.

Note: LAFTA = Latin American Free Trade Area.

Diag Ib BASIC ECONOMIC AND SOCIAL INDICATORS OF DEVELOPMENT IN THE CENTRAL AMERICAN ECONOMIES

	Guatemala	El Salvador	Honduras	Nicaragua	Costa Rica	Rest of Latin America (Mexico)	(Peru)
(1) Population[a] (millions 1970)	5.18	3.44	2.58	2.02	1.80	49.0	13.2
(2) Real per capita GDP growth[b] 1960-70 (% p.a)	2.2	2.5	1.7	3.6	2.9	(L.A. excl Brazil) 2.3	
(3) Population Growth[c] (% p.a)	3	3.3	3.5	3.1	3.9	(L.A excl. Brazil) 3.0	
(4) Rate of Inflation[d] 1960-69 (% p.a)	.7	.4	2.5	1.9	2.2	— (Latin America)	
(5) Share of[e] in GDP — Agriculture %	27.5	26	38.5	27.9	22.4	23.4 (all)	
— Manufacturing %	16.0	19.5	15.0	16.0	19.3	19.1	
(6) Share of[f] Employment — Agriculture %	64.0	60.5	66.0	56.0	48.0	(Mexico) 50 only	
— Manufacturing %	14.1	16.9	9.5	17.0	18.9	22	
(7) Population Density Population per Km^2 of cultivable land (1970)[g]	252	315	61	59	116	(Mexico) 44	
(8) Urban population (in towns) (1970)[e]	36	38	26	42	36	50 (Mexico)	
(9) Central Government Tax Revenue[i] over GDP	7.5	9.4	10.4	8.5	11	—	

(10) Illiteracy over 15 (1968)[i]	63 (1969)	49.2	53 (1960)	50.2 (1963)	14.4	(Mexico) 23.0 only	
(11) % of school age enrolled[i] 1968	36	52	55	42	62	61 (Mexico)	
(12) Nutrition[i]						(Mexico)	(France)
cals. per day per capita	2200	1840	2010	2350	2610	2560	3100
Changes (1955-67) % pa	7.8	-9.4	-3.4	22.2	7.9		
Protein gms. per day (1967)	56.8	44.2	51.0	59.0	57.9	(Mexico) 65.4	(France) 100.4
Changes (1955-67) % pa	2.5	-22	4.9	5	7.4		
(13) Life expectancy at birth[i] (yrs) 1968	47	56.9	42.6	51.0	63.3	(France) 71.5	
1950	43.6	51.4	36.9	38.6	56.5		
(14) Infant mortality 1968[i] per 1000 births	28.5	10.4	12.7	7.0	3.3	(France) 2.1	
(15) Doctors per 10,000 inhabitants[i]	2.2	2.3	2.1	4.2	5.7	(Mexico) 5.5	
(16) Housing with sanitary fittings	30.6		19.8	21.3	68.3	—	
running water[i]	29.5		24.9	44.3	74.5	32.3 (Mexico)	
electric light[i]	22.0 (1964)		14.6 (1961)	32.9 (1963)	54.6 (1963)	—	

a. U.N. National Accts. Statistics; b. U.N. Demographic Yearbook; c. ECLA data; d. Average annual percentage increase of consumer prices. IMF Financial Statistics; e. Manufacturing excl. mining but excludes construction and public utilities, from U.N. Yearbook of National Accts; f. Manufacturing includes construction but excludes electricity, transport, utilities etc, local data. g. "Dator basicos de Poblacion en America Latina, 1970"; OAS (Dept. of Social Affairs) from Latin America Demographic Centre; h. Urban areas are those with 2000 inhabitants or more, data as in g.; i. Social Indicators from United Nations Economic Survey of Latin America (1970) and the I.A.D.B. "Socio-economic Process in Latin America, 1969" based on United Nations, "Population and Vital Statistics Report, 1970" and Pan American Union: "American en Cifras".

Note on the Central American economies and Common Market

It is not intended to describe at length the Central American economies though Diag. 1. is an attempt to draw together some of the key economic indicators of development, and the standard of living of the people. Central American statistics are extremely unreliable and Appendix I is devoted to explaining their deficiencies. One must, however, use something.

Equally it is not intended to describe in detail either the history or institutions of the Common Market. [illegible] the main treaty obligations and Chapter 2 discusses the most important features in a comparative framework.

Chapter I. The Economic Theory of Integration as a Rationale for Central American Integration.

In this introductory chapter an attempt will be made to review the theory of "economic integration" amongst "developing countries".[1] However, in order to show the relevance of different aspects of the theory, the assumptions and predictions will be checked against Central American data. The distinctive features of the theory of integration involving as its basis a customs union arrangement, is that it must simultaneously deal with the two features of the union: one, the existence of free or freer trade between partner states which represents a move towards freer world trade and second a discriminatory tariff against third countries which involves a consideration of the reasons for protection. The benefits resulting from economic integration may come from different sources. Lipsey's survey of the theory lists five: (i) gains from specialisation, (ii) economies of scale, (iii) terms of trade effects (of the external tariff), (iv) forced changes in efficiency from increased competition, (v); an increase in the rate of growth resulting from structural changes.[2]

It will be argued that "static gains" from freer trade and more efficient resource allocation according to comparative advantage are unimportant in the Central American context, and that "dynamic" benefits are more relevant, and also those deriving from economies of scale enjoyed in a regional market by the manufacturing industry which is protected by the external tariff. It is important, however, to see how the theory has been built up, step by step.

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(1) For a basic definition of economic integration, we assume the minimum existence of firstly, the elimination or substantial reduction of barriers on trade among partners; and, secondly, discrimination against non-members of the group.

(2) R. Lipsey: "The theory of customs unions: a general survey" Economic Journal, Sept. 1960 p. 486.

The Traditional Theory

It has been said that the main concern of the "traditional theory" is "to evaluate customs unions from a world welfare point of view using static effects as a criterion".(1)

Viner in his analysis of customs unions sets out a series of propositions which form the basis of the "traditional theory of customs unions".(2) Viner and those who wrote in a similar vein were dealing with a model which had the same basic underlying assumptions as the static theory of comparative advantage.

Within these very unreal assumptions it is shown that regional economic integration creates both gains and losses from changed resource allocation. Trade "creation" is a beneficial effect resulting from a switch of demand from inefficient protected firms operating nationally to more efficient firms in a partner state: trade "diversion" occurs when goods formerly imported from outside the region are replaced by goods from less efficient firms within the union. The net of these two effects (3) indicates the contribution of the customs union to

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(1) Yu Min Chou: "Economic integration in less developed countries: the case of small countries" Journal of Development Studies, July 1967, p. 19.

(2) J. Viner: "The Customs Unions Issue" Carnegie Endowment for International Peace, 1950, esp. ch. 4; also B. Balassa "Theory of Economic Integration", Allen and Unwin, 1961 (ch. 2).

(3) Alternatively, positive and negative "production effects".

improved global resource allocation, and it will not necessarily be positive.(1) This is one of the implications of the "theory of the second best": that, given obstruction to trade, a partial movement towards the "first best" of universal free trade under pareto optimum conditions will not necessarily result in greater welfare.(2)

This only takes into account production effects and assumes demand curves of zero elasticity and supply curves of infinite elasticity. However, changes in relative price could clearly affect the level of consumption, too, for an individual product, and between products, if elasticities of demand are positive.(3) Even if production effects are negative, the consumption effects can still be positive due to the effect of the elimination of the duty on regional trade, i.e. prices to the consumer may be lower even though procurement is not from the cheapest source. Gehrels conceived of positive consumption effects "as the response of consumers to a drop in import prices caused by the tariff removal" i.e. a reduction in indirect taxation if there is no offsetting excise tax. Assuming a two-product model (one domestic good;

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(1) The actual magnitude of this benefit can be simply assessed by calculating changes in the trade flows. Meade demonstrates that if demand curves are totally inelastic the welfare measure can be obtained by comparing the values of diverted and created trade weighted by cost differences between alternative sources:
J. Meade: "The Theory of Customs Unions", North-Holland 1955, p.34-36.
Also
B. Bentink: "Estimating trade creation and trade diversion", Economic Journal, June 1963, pp.80-93.

(2) R. Lipsey & K. Lancaster: "The general theory of the second best" Review of Economic Studies 1956-57 pp.11-32.

(3) The Vinerian model assumed that demand elasticities were zero and that goods were consumed in fixed proportion regardless of price. Meade dealt with cases where these assumptions were relaxed and first introduced 'consumption effects'.

one import) he argues that consumption effects must have a positive welfare effect.(1) Lipsey argues that the end result is indeterminate:(2) the consumption effect like the production effect can work either to raise or to lower welfare. Meade showed that the net consumption effect depends on the initial structure of tariffs and the demand elasticities.(3) The overall welfare effect will be a combination of production and consumption effects and in some cases the consumption effect could outweigh a production effect i.e. trade "diversion" could raise welfare.

The basic weakness of this type of partial analysis(4) is the fact that the assumptions which underly the theory are untenable and thereby render the findings of limited value. For example if there are unemployed resources (as in Central America) then production engendered by "trade diversion" will result in the movement of labour from a situation of negative to positive production, generating real income to offset the efficiency loss. The efficiency factor is still relevant, but only one aspect of the possible gains. Or under conditions of economies of scale, trade "diversion" may cease to be negative if additions to output tend to a fall in average unit costs and below the original third country cost. For

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(1) F. Gehrels: "Customs union for a single country viewpoint", Review of Economic Studies, 1956-57 p.61.

(2) R. Lipsey: "Mr. Gehrels on customs unions": Review of Economic Studies, 1956-7 p.211. Also R. Lipsey: "The theory of customs unions: trade diversion and welfare", Economica Feb. 1957 p.41.

(3) J. Meade: "The Theory of customs unions" op. cit. pp.40-52.

(4) Attempts have been made to build up a general equilibrium model on similar assumptions: M. Johnson: "Discriminatory tariff reductions: a Marshallian analysis" in "Money Trade & Economic Growth", Allen & Unwin, 1962; R. Lipsey: "A Theory of Customs Unions", Weidenfeld & Nicholson, 1970; J. Vanek: "The Case of Customs Unions", Harvard Univ. Press, 1965; N.C. Kemp: "A Contribution to the General Equilibrium Theory of Preferential Trading", North-Holland 1969.

this reason we should not attach too much importance to the conditions for successful economic integration which follow from the static theory.(1) However, for completeness, they will be listed:

(a) Viner suggested that the more the partners are competitive in the sense that they produce similar products, the greater the potential from "trade creation" gains. MaKower and Morton added that the larger the cost differences (i.e. "complementarity" in cost) in identical products the greater the gain too.(2) Spraos also questions whether overlapping economies are a sufficient condition for gain and he points out that the degree of "competitiveness" or "complementarity" is only meaningful if considered relative to that of extra-regional trading patterns.(3)

In the Vineran sense the Central American economies are "competitive" but in a trivial manner: their exports consist largely of primary products (coffee is a leading export of three of the five countries) which are competitive in the world market and have negligible local demand anyway. The concept of "trade creation" is more relevant to locally produced manufactures and foodstuffs which enjoy protection, but which are not important; and in new industries not yet established. The economies are in fact neither complementary nor competitive: production is geared to external demand and demand is geared to external production. The theory, there-

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(1) These predictions are drawn from a variety of sources and are set out in J. Viner: "The Customs unions Issue" op. cit. pp.52-3.
B. Balassa: "The Theory of Economic Integration", op. cit.pp.29-49.
Also J. Meade: "The Theory of Customs Unions", op. cit.pp.107-115.
R. Allen: "Integration in less developed areas", Kyklos 1961, pp.315-34.

(2) M. MaKower and G. Morton: "A contribution towards a theory of customs unions", Economic Journal, 1953 pp. 33-69. Unfortunately, there has been a good deal of unnecessary confusion over the use of the concept of "complementarity" in the two senses.

(3) J. Spraos: "The condition for a trade-creating customs union", Economic Journal March, 1964 pp.101-108 and also "comments" by E. Mishan, Economic Journal 1965 p.238 and J. Spraos, Economic Journal 1965 p.241.

fore, would be pessimistic of the outcome.

(b) A second prediction is that gains will be greater the higher the proportion of trade with union partners, considered ex-ante, and the less with the world outside. This condition should be taken together with another which indicates that a customs union is more likely to raise welfare the lower is the total volume of foreign trade as a proportion of GDP.(1) As Central America derives about 15% of its GDP from foreign trade (i.e. $\frac{\text{imports and exports}}{2}$) and had only 4% of its total trade, intra-regionally, at the inception of the Common Market, it would appear to fall into the category of "countries which are likely to lose from a customs union .... are those in which a low proportion of trade is domestic especially if the customs union does not include a high proportion of their foreign trade".(2) In this respect the Central American nations have much in common with other underdeveloped areas (in 1958 the proportion of intra-regional trade in West Africa was 1%; the Middle East 10%; and Latin America 9%) and less in common with W. Europe where 30% of total trade was intra-regional at the start of the EEC. However, even if we limit ourselves to "efficiency" gains it is still conceivable that small volumes of intra-regional trade could be attributable more to poor transport, lack of knowledge and non-economic barriers rather than lack of opportunities for specialisation.

(c) Traditional theory suggests that the gains are likely to be greatest the higher the initial tariffs between the partners and the lower the common external tariff. This condition seems likely to be met in Central America as there are generally very high tariffs on locally produced manufacturers and agriculture and low tariffs on imports of capital goods and raw materials (see Appendix 4).

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(1) R. Lipsey: "The Theory of customs unions: or general survey", Economic Journal, 1960, op. cit. p. 509.

(2) J. Meade: "Theory of Customs Unions", op. cit. p. 109

(d) There has also been raised, the importance of the size of union as a determinant of success.(1) Common sense would indicate that the larger the unit, the greater the scope for specialisation but there are limiting factors of transport costs, and negotiating complexities with large numbers.

Generally speaking the predictions of the traditional theory do not offer a very clear indication of gain from economic integration in LDC's, and this has been used to cast doubt on the medium of integration.(2) However, it is more convincingly explained by the unrealistic assumptions of the theory: thus, "the traditional theory of customs unions will be of little use for evaluating the desirability and the possible consequences of integration among less developed countries"(3) and "I seriously question the applicability of the generalisations of the theory of customs unions which relate complementarity, competitiveness and trade patterns to the potential gain from customs unions".(4) No doubt it could still be

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(1) The question of "economic size" is discussed later, in chapter 5. The question of what constitutes an 'optimum' sized regional unit has been an important policy issue. The CACM is due to integrate ultimately with LAFTA and there have been discussions of the possibility of including Panama in the present framework: Tavares Gomez Ramon: "Aspectos Economicas de la Vinculacion de Panama al Mercado Comun Centroamericano" Panama 1966. E. Delgado, F. de Sola and E. Lizano: "La Participacion de Panama en la Programande Integracion Economica" Guatemala 1967.
The Dominican Republic also applied for membership in 1968.

(2) R. Allen: "Integration in less developed areas" op. cit. "An extremely low level of economic development will tend to keep economic benefits to a minimum ... the higher the stage of economic development the greater the potential gain". pp.315-29.

(3) B. Balassa: "Economic Development and Integration" CEMLA Mexico 1965, p.35.

(4) R. Mikesell: "The theory of common markets as applied to regional arrangements among developing countries" in "International Trade Theory in a Developing World" Harrod & Hague (Ed.) 1963.

Diag. I-1 Case studies of static welfare estimation

Study	Case	Gain to GNP
P. Verdoorn: "A customs unions for Western Europe - Advantages of Feasibility" World Politics July 1954 pp.482-500	Effects of a customs union in West Europe of Scandinavia, the EEC, and the U.K: (ex-ante).	.05% of GNP
T. Skitovsky: "Economic Theory and Western European Integration" 1958 pp.64-70.	Effects on pattern of trade of Customs Union amongst EEC countries; Scandinavia & Britain in 1962: (ex-ante).	.005% of GNP with equivalent loss to rest of the world.
J. Wemelsfelder: "The short-term effect of lowering import duties in Germany" Economic Journal 1960, pp. 94-104.	Effects of lowering tariffs in Germany in 1956-7, by more than 50%: (ex-post). (N.B. this was not directly concerned with a customs union arrangement).	.0018% of GNP
B. Balassa & M. Kreinin: "Trade liberalisation and the Kennedy Round: the static effects" Review of Economics and Statistics 1967 pp. 125-138.	Effect of Kennedy Round tariff reductions: (ex-post).	.03% of GNP (from .5% expansion of trade as proportion of GNP)
A. Singh: Ph.D. thesis - reference in Leibenstein "Allocative efficiency v. x-efficiency" American Economic Review 1966 pp.392-415.	Gains from trade in LAFTA using Skitovsky measure: (ex-post).	.000075% of GNP
H. Johnson: "The gains from free trade with Europe; an estimate": Manchester School 1958 pp.47-66.	Effect on value of UK trade from joining EFTA (est. 1970) (ex-ante).	increase in trade of £225m - no estimate of welfare gain: (possibly about .02%).

argued that "efficiency" gains represent one element of the gains, though there is considerable scepticism generally about the magnitude of gains from a reallocation of resources seen stat. . ically.(1)

Not a great many studies have been made, endeavouring to calculate gains and losses from improved resource allocation. However, the results of some of them are summarised in Diag. I-1. Generally, static welfare effects resulting from tariff reductions are very small indeed when converted into real income terms. However, with the exception of the unpublished Singh study, the calculations refer to the effect of small tariff reductions on advanced industrial economies - a different situation from the one which we are studying, but nevertheless, an environment in which from theory, one would expect the gains to be greater. It should also be remembered that "gains can be realised only if a high degree of substitutability of factors and products exists. Countries which have transformation problems will be unable to reap the potential allocation gains for trade creation. Specialisation will be increased not by expanding one industry and contracting another, but simply by destroying the new unprotected industries and creating unemployment."(2)

If we are concerned with the benefits of trade creation then it will be realised most effectively by reducing all tariff barriers through opening any individual economy to free trade. The traditional theory does not begin to explain why we have a common tariff especially at a higher level than existed before integration: it merely assumes its existence. "These arguments ... are equally arguments for unilateral tariff elimination which would have the advantage of entailing no losses from trade diversion".(3) For this reason, we must look at arguments for maintaining

(1) Tayseer Jaber: "The relevance of traditional integration theory to less developed countries", Journal of Common Market Studies, March 1971, pp.256-276. He refers to the study by Liebenstein "X-national v. X-sectional efficiency", American Economic Review 1960, pp.392-415, which expresses the view that ... "allocational or "static" welfare gains from customs unions, or a more "competitive" market structure will be small compared with the dynamic effects", (pp.274-5).

or erecting a common tariff. From this point of view the case for customs unions rests on the following propositions.(1)

(a) An optimal strategy for the area (whether actually optimal or believed to be) is to bias development to industrialisation realized by import substitution behind a protective tariff rather than by subsidised exports to the world market.(2)

(b) As industry is sensitive to 'economies of scale', the costs of protection will be less and gains greater, if the market is as large as possible. Moreover, we are not solely concerned with internal economies of scale to the plant, but with a whole range of "dynamic" effects derived from the expansion of market size.(3)

See also K. Griffin "The potential affects of Latin American Economic Integration" Inter-american Economic Review Spring 1964.

(2) K. Griffin & R. Ffrench Davis "Customs Unions and Latin American integration" Journal of Common Market Studies 1965, pp.13-14.

(3) H. Johnson "An economic theory of protectionism tariff bargaining and the formation of customs unions", Journal of Political Economy, June 1965 p. 280.

(1) This summary argument is distilled from a whole set of readings which (with differences of emphasis) basically constitute the "dynamic" theory of integration e.g. R. Mikesell: "The theory of common markets as applied to regional arrangement among developing countries", op. cit.; S. Linder: "Customs unions and economic development" and H. Kitamura: "Economic integration of underdeveloped regions" both in M. Wionczek: "Latin American Economic Integration", Mexico 1965; R. Bhambri: "Customs unions and underdeveloped countries" Economica Internazionale, 1962, pp.235-58.

(2) In developing this theme one is ignoring those arguments which are based on the role of integration in helping agriculture; for example the idea that joint negotiation over commodity exports might improve the terms of trade; or the argument that there are considerable gains from specialisation by crop: M. Yudelmann & F. Howard: "Agricultural Development and Economic Integration in Latin America", Allen & Unwin, 1970.

(3) The distinction between "static" and "dynamic" effects is blurred but the following is a working distinction: static effects assume that resource endowments, tastes, technical knowledge etc. are fixed while dynamic effects are manifested when they are allowed to vary.

Integration Theory and Industry Preference

The first proposition which is at the root of contemporary integration theory as applied to developing countries is that there is a preference within the partner states for a strategy of major structural transformation including industrialisation by import substitution which should be pursued behind an external tariff if necessary. There is a very large literature about the theory of protection which will not be discussed here. It should be stressed however that there are some arguments for external tariff protection which can be dealt with in "static" terms; the "terms of trade argument (1) "balance of payments" (2) argument, and the traditional infant industry case. We are not directly concerned with these 'partial' arguments, only with the case for across-the-board application of the "infant-industry" concept involving fundamental structural change, leading to industrialisation.(3) "The problem is one of fostering the structural transformation of these economies; a disposition to interpret comparative advantage as something which is not only changing but which can forcibly be changed; emphasis on the existence of unemployed resources which traditional theory disregards;

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(1) It is argued that if 'trade diversion' results in a fall in demand for the imported foreign product and if the region is a significant purchaser then a fall in import prices could result. Even if the argument is theoretically valid, it is irrelevant to Central America which is a marginal purchaser.
M. Flanders: "Prebisch on protectionism", Economic Journal 1964, pp.305-320.
R.A. Mundell: "Tariff preferences and the terms of trade", Manchester School 1964, pp.1-13.
S. Arndt: "On discriminatory versus non-preferential tariff policies". Economic Journal 1968 pp.971-9.

(2) It is possible for a tariff to be import saving without being import substituting in as much as the price elasticity of demand for the imported goods is positive while domestic supply is infinitely inelastic. Tariffs and control can be used to change consumption patterns altogether.
D. Seers: "A model of comparative rates of growth in the world economy", Economic Journal 1962, p.45. An example of tariffs being used as an import surcharge occurred with the San Jose Protocol, introduced in 1968.

(3) We shall also endeavour not to fall into the fallacy of arguing purely in terms of "agriculture v. industry", a false antithesis, and a gross over-simplification. Nevertheless the line of argument overlaps to a considerable extent: M. Flanders: "Agriculture v. industry in development policy: the planners' dilemna re-examined". Journal of Development Studies, April 1969. pp.171 189.
I. Livingstone: "Industry and agriculture in economic development". Journal of African Studies. 1968. pp.329-341.

; emphasis on the persistent trend toward imbalance dramatically portrayed in the statistical estimation of the "trade gap"; arguments for reducing export dependence in the interests of promoting domestic stability; and in particular the favourable effects of protection on the influx of capital." (1) The Latin American variant of this approach - "the ECLA doctrine" - rejects the traditional role of specialisation in primary products for export to the world economy, in favour of manufacturing for domestic or regional production as a more probable source of sustained economic growth. This case for industrialisation will now be looked at more closely, in context.

The traditional basis of the Central American economies has been the highly specialized export of primary commodities: "In the middle of the nineteenth century, the long search for new export lines came to a successful end. From then on, and for the next one hundred years the agricultural economy was to be based upon the production of coffee and bananas ..... The enlargement of the available market through international trade and the growing demand for a commodity which was particularly adapted to the capabilities of nations resources, opened unprecedented possibilities for economic gain." (3)

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(1) P. Robson: "Economic Integration in Africa", Allen & Unwin 1968, pp.34-35.

(2) This "doctrine" traces its origin mainly to R. Prebisch e.g. "Commercial policy in underdeveloped countries", American Economic Review Papers and Proceedings 1959, pp.261-264.
See also M. Flanders: "Prebisch on protectionism", op. cit.

(3) C. Castillo, "Growth and Integration in Central America", Praeger 1966 pp.12-13.

This form of development had repercussions familiar to students of "dualism" in a development context[1] with an absence of "spread" effect to the rest of the economy: "there gradually emerged the new familiar inertia of the monocultural economy that has limited the horizon of possibilities for the expansion and diversification of the productive structure of the region. Railway development for example solely met the needs of the banana and coffee "Finqueros".[2] Though the process varied from country to country-e.g. Nicaragua developed on the basis of cotton later in time, and Honduras's "banana boom" resulted in a spatial separation of the economy on a North-South basis - the distortions introduced in this period lasted throughout 1850-1950 leaving the traditional, subsistence sector isolated and backward, a source of seasonal labour (some forced) and land onto which plantation cash crops could expand at the expense of wheat and cotton.

However, the main problems of the economy after the 1940's resulted from demand deficiency for the main export products: "after fifty years of steady growth followed by three decades of increasing deficiency the agricultural economy is no longer capable of performing as it did at the turn of the century".[3]

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(1) The word is used in the sense of "technological dualism" as used by Hla Myint: "An interpretation of economic backwardness" Oxford Economic Papers 1956, p. 46;
A Lewis: "Economic development with unlimited supplies of labour", op.cit. and B. Higgins, "Economic Development," New York 1959, p.59; to refer to a divergence within an economy, into one sector which is commercial, export-oriented and mechanised and another which is based on a primitive subsistence technology. The term "dualism" is also used to apply to spatial dualism as in Italy, (V. Lutz: "A study in economic development", Oxford 1962 pp.13-42,) and to international inequalities based on difference in technology (H. Singer: "Dualism Revisited": Paper of the Institute of Development Studies. Sussex 1970.)

(2) C. Castillo, op. cit. p. 19.

(3) C. Castillo, op. cit. p. 60.

Diag. I-2 The Structure of Foreign Trade of the Central American Countries.

Guatemala

($ m.) EXPORTS

	1958	1968
Coffee	74.2	73.4
Cotton	5.4	41.0
Bananas	13.1	8.0
Fresh meat	-	8.6
Sugar	-	8.0
Others	11.4	83.6
Total	107.5	226.7

El Salvador

	1958	1968
Coffee	84.1	93.6
Cotton	18.1	14.5
Others	25.2	
Total	118.0	212.0

Honduras

	1958	1968
Coffee	10.9.	20.8
Cotton	2.6	3.8
Bananas	37.6	79.7
Timber	6.5	14.5
Cattle & Meats	2.5	7.5
Minerals (silver, lead etc.	2.5	7.5
Others	8.7	34.0
Total	71.3	179.0

Nicaragua

($ m.) EXPORTS

	1958	1968
Coffee	24.2	22.7
Cotton	24.9	59.7
Sold sugar	7.3	5.0
shrimps	-	5.5
timber	-	5.1
Cotton seed	3.0	1.6
Others	3.9	3.3
Total	16.0	54.3
	70.4	157.3

Costa Rica

	1958	1968
Coffee	50.5	55.3
Bananas	26.5	43.7
Cocoa	5.8	3.3
Cattle & meat	3.2	12.0
sugar	-	8.7
Others	5.6	47.8
Total	91.6	170.8

Central America

	1958	1968
Coffee	247.2	265.8
Cotton	51.0	119.0
Bananas	77.3	88.7
Timber	10.0	16.1
Cocoa	5.8	3.3
Meats & cattle	4.7	19.5
sugar	2.9	22.2
Others	59.7	411.5
Total	458.8	946.0

Looking at the contemporary economic structure we should first draw attention to the degree of concentration of exports. As can be seen from Diag. 1-1the five economies exports are totally dominated by a few primary products, notably coffee. This can be shown formally by using an index of commodity concentration (Diag.I.3) though there are deficiences in this method.(1) Central American exports are seen to be highly concentrated though no more so than other primary producing Latin American countries like Colombia and Brazil.(2)

Such a concentrated pattern would in theory be expected from a system of multilateral trade specialising according to comparative advantage. Indeed, it was seen in that light, pre-1914. By contrast, an economy so specialised is also highly dependent on the vagaries of the market for one product. Two specific complaints have been made regarding such dependence. The first relates to short-term price and earnings variations when one or two export crops contribute a substantial proportion of national income. The second and more important focuses are not on fluctuations, but on long term trends; the slow long term growth of export demand, and the secular decline in export prices. These two aspects are now briefly looked at, separately.

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(1) Notably the fact that many products are split in the standard classification which would show less commodity concentration than was meaningfully the case. However, if we take 100 as the maximum of total concentration, then this is almost approached by Mauritus; while at the other end of the scale France has the most diversified exports. There are some richer countries (like Australia) with approaching the same index and some poor ones with much less (like India). It is interesting also to note the sharp decline in concentration over a decade, partly due to Common Market trade, but also to diversification into timber, meat and sugar. The import coefficient is generally low (under 20) as in most other countries with generalised import requirements.

(2) Michaely found a strong correlation between export diversification, development and industrialisation; M. Michaely: "Concentration of Exports and Imports: An International comparison" , Economic Journal Dec. 1958, pp. 722-736.

Diag. I . 3.

A table showing differences in Commodity concentration index amongst a sample of countries: 1954 - 1964.

	1954	1964
Honduras	63	43
Costa Rica	60	50
Guatemala	72	47
El Salvador	86	56
Nicaragua	58	47
Mauritus	99.5	
Colombia	85	73
Brazil	61	54
Australia	51	36
Argentina	29	30
Japan	24	13
UK	19	13
Venezuela		71
Tanzania		73
India		22
France		9

Notes: the index used is the Gini-Hirschmann coefficient of concentration. The index can be expressed as $100 / \left(\frac{xij}{xj}\right)^2$, where xij is the value of country j's exports of i to the rest of the world and xj represents the total value of country j's exports in the same period. Commodities are defined in three digits SITC (Standard Internal Trade) categories. The index is discussed in A. Hirschmann: "National Power & structure of Foreign Trade" pp. 6-18.

Sources: 1954 data and methodology from M. Michaely: "Concentration in International trade, or else computed from national data (as in OAS: Economic Survey of Latin America, 1962 p. 265); 1964 data from P.J. Lloyd: "International Trade Problems of Small Countries", Appendix II and Central American figures from World Bank Survey (1967) Vol. 2, Table 25 a - f.

Deteriorating Terms of Trade.

First of all let us take the hypothesis that the export sector has been a "lagging sector", due to the influence of declining commodity terms of trade; the essence of the Prebisch thesis.(1) The argument is very briefly that due to low income elasticities of demand in developed countries for agricultural products and (most) raw materials,(2) attempts by the LDC's in general to increase output faster than the slow growth of demand will lead to a fall in prices which because of low price elasticity will not markedly increase demand; therefore, a secular deterioration of prices over time results in the fruits of technological progress being transmitted overseas (to the "centre") from the exporters ("the periphery") while the same does not happen in reverse trade. This is because monopolistic influences in the labour markets of the developed countries hold up export prices, and the high income elasticity of demand for manufactures sustains a high growth of demand for their exports. The general explanations for this unfavourable development are contained in the FAO's Indicative World Plan for agriculture; "the progressive saturation of per capita requirements in those importing countries already in higher income levels; increased competition from synthetics; competition from production in the high income countries; import duties on processed products; (and) low allocation of foreign

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(1) R. Prebisch: "Commercial policy in the underdeveloped countries", op. cit.
"The Economic development of Latin America and its principle problems", Economic Bulletin of Latin America. Feb. 1962 pp. 1 - 23.

(2) The UN World Economic Survey (1968) gives the following figures for coefficients of income elasticity of demand in developing countries (A) and industrialised countries (B).

	A	B
Food & Beverages	.6	.75
Crude Materials	.5	.6
Manufactures	1.9	1.25

Elsewhere the income elasticity of demand for agriculture and food supplies in the Central American countries is estimated at .4: FAO "Agricultural Commodities Projections 1975-85", Vol II Rome pp.28-33

exchange in centrally planned economies for exports of tropical products."(1) Empirical evidence tends to support a pessimistic view.(2)

The implications of this for development are essentially that a slow rate of export growth arrests the rate of capital formation which depends upon imported capital equipment unless capital inflows can be induced. This results in a "trade gap", a discrepancy between exports required to maintain a given growth rate, and actual exports.(3) In an extreme form (which is not so evident in Central America) the "trade gap" manifests itself in a gap between imports which are at a fixed minimum (fuel, spare parts, capital equipment etc.) for a given growth rate and exports at fixed maximum because of supply and demand difficulties.(4) However, before accepting such an extreme interpretation one would need to be convinced of the existence of an "export maximum", of the impossibility of substituting consumer goods by capital goods on the import side and on the impossibility of affecting the net inflow of capital.

This is not the place to review the whole empirical and theoretical basis of the hypothesis regarding commodity exports. The question is

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(1) "The Indicative World Plan for Agricultural Development". FAO 1969 Vol.III p.12.

(2) e.g. A. Maizels: "Industrial Growth & World Trade" Cambridge 1963 p.409 (Survey) and B. Cohen: "The less developed countries exports of primary products" Economic Journal 1968. pp.334-343. However this would be contested inter-alia by C. Kindleberger: "The Terms of Trade" New York 1956; S. Von Harberler: "Terms of trade and economic development", in "Economic Development for Latin America", Ellis & Wallich (ed.) p.275-297; W. Baer "Economics of Prebisch & ECLA" op. cit.

(3) S. Weintraub: "The Foreign Trade Gap of LDC's" Princeton Papers no. 48.

(4) S. Linder: "Trade & trade policy for development" in "Theory of economic integration" in M. Wionezek, op. cit. "Economic Integration in Latin America"

whether Central America has had this unfavourable terms of trade experience and whether it has been paralleled by a short-fall or slow growth of export earnings.(1)

If an estimation is made for the post-war period in Central America (Diag. I-4), and as far as 'net barter terms of trade" are concerned there is a distinctive decline since 1954-55 when the post-war boom in commodity prices ended. Between 1957-62 the coffee price fell by 40%; banana prices were also adverse. However, the income terms of trade which were not so obviously favourable in the "boom" period for prices are now considerably improved and have more than outstripped the fall in commodity prices up the middle sixties. This is true even when intra-regional trade is excluded. Cotton exports benefited particularly from volume increases, with the opening up of the Pacific coastal lands.

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(1) This point leads one to the question raised by Wilson and others that the conventional measure of the "net barter terms of trade" ($N = \frac{Px}{Pm}$ where Px is a price index for exports, and Pm is the price index for imports) is not a meaningful indicator of the purchasing power of exports which is better defined by the "income terms of trade" ($I = \frac{Px}{Pm} \times Qx$ where Qx is the quantity index of exports). Assuming that an individual country is sufficiently small to have no effect on the world prices, and that it has unemployed land and labour there is little economic cost (to itself) of expanding its volume of sales, even in poor world market conditions. The Wilson study concludes (on the basis of 1950-65 data) that I is rising substantially in many cases while N was falling (taking the whole world economy there is an obvious causal connection): "the rises that have taken place in I often in the face of deteriorating or static net barter terms afford an encouraging indication that progress can be made even when on general grounds neither the initial structure of trade nor the elasticities may have appeared to be particularly favourable". There is an underlying assumption that exports have a role as a "vent for surplus". In fact some scarce factors are tied up even in commodity exports.

T. Wilson; R. Sinha & J. Castree: "The income terms of trade of developing countries" Economic Journal. 1969 pp.813-832.
Also G. Meier: "International Trade & Development" New York 1964 pp.40-45 for the significance of various definitions of terms of trade.

Another way of looking at this problem is to contrast the growth performance as it occurred with growth performance as it could have occurred in the absense of terms of trade deterioration:

	Actual growth of G.N.P.: 1960-68	Growth without terms of trade deterioration
Costa Rica	6.5%	6.2
El Salvador	6.1	5.8
Guatemala	5.0	4.6
Honduras	5.7	5.9
Nicaragua	7.6	7.9

Source: World Economic Survey 1968 p. 13

There was somesmall deterioration in the performance of the first three countries as a result of the terms of trade; but an improvement in the case of the other two. The early 1960's, however, was not a very suitable base period as it was the nadir of the post-war commodity price deterioration for coffee and bananas.

Diag. I-4 Commodity and Income Terms of Trade of Central American Exports.

	Guatemala			El Salvador			Honduras			Nicaragua			Costa Rica		
	N	I	I'	N	I	I'	N	I	I'	N	I	I'	N	I	I'
1938	-	-	-	45	30								74	47	
-															
1948	76	74		62	38		92	87		74	32		77	53	
-															
1950	113	97		124	87		112	99		101	53		111	72	
1951	118	89		123	81		109	98		126	93		112	74	
1952	120	108		117	82		117	101		116	79		109	83	
1953	-	-		-			119	-					117	101	
1954	144	115		164	107		121	85		143	99		133	104	
1955	132	116		125	96		121	87		125	126		124	100	
1956	141	130		121	97		120	110		128	101		132	79	
1957	128	117		120	120		110	100		116	106		120	95	
1958	100	100		100	100		100	100		100	100		100	100	
1959	83	99	97.5	84	101	94	90	90	88	89	101		90	82	
1960	85	105	102	83	102	95	88	83	81	90	76.5		85	86	
1961	79	92	86	78	101	94	87	100	98	85	72		81	84	
1962	78	94	88	71	116	108	101	98	92	85	79		73	85	84
1963	73	123	109	72	128	115	112	103	98	85	81		81	89	84
1964	83	132	113	78	152	131	115	115	104	89	95	93	86	95	86
1965	86	154	137	78	172	141	114	148	139	97	126	126	80	90	79
1966	90	193	155	77	162	121	114	187	177	96	158	142	79	102	90
1967	90	172	138	72	166	123	114	200	190	97	165	148	70	113	88
1968	91	197	154	75	203	152							66	141	112
1969	92			72	203	150									

N: Commodity terms of trade.

I: Income terms of trade.

I': " " " " ... excluding intra-regional trade.

Source: IMF Financial Statistics.

Long period improvements in income terms of trade mask changes in commodity composition (even if we exclude common market trade) and the relatively more favourable picture shown by the income terms of trade is partly due to supply flexibility as well as increased volumes of the traditional specialist crops.

As regards future capacity for increasing export receipts most sources have been pessimistic (1) though the picture is variegated.

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(1) (a) the OAS predicted (wrongly) a 2.7% growth rate in export income over 1962-67 which could be as high as 5% or as low as 2%; OAS (Pan American Union) Economic Survey of Latin America 1962 p. 295.

(b) Hansen predicted a 3-4% export income growth rate from 1966 [illegible]: R. Hansen: "Central America. Regional Integration and Economic Development" National Planning Association 1967.

(c) The World Bank has predicted over 1965-70 a decline to a 2.5% growth rate in incomes from exports rising to 4.5% later: World Bank Report (1967) Vol. I Main Report pp. 11-15.

(d) One can also gain some insight from the national plans which the following projections for extraregional export receipts.

(i) El Salvador: a growth rate of 1.9% only in traditional exports is predicted over 1968-72 as against 8.5% for all exports and 6% for GDP. No growth at all is anticipated in coffee receipts. This pattern is consistent with the slowing of growth in the later 1960's in this sector: El Salvador: "Plan de desarollo economico y social 1968-72"

(ii) Guatemala: over 1970-75 a growth rate of 2.5% in traditional non-Central American exports receipts is anticipated; with an absolute decline in coffee receipts: Guatemala: "Plan de desarrollo: 1971-75"

Whereas in these two cases the growth of extra-regional exports has been below the regional GDP both before and after the planning period the picture is quite different in,

(iii) Honduras: in the 1969-72 planning period export growth rates (outside Central America) were to rise 5-6%; though this was following a period in which banana receipts had more than doubled since 1962. Honduras: "Analysis de la economica nacional en 1969 y perspectives para 1970-71".

(iv) in Costa Rica: 1968-72 planned extraregional trade increases of 20% were forecast mainly on the basis of banana growth, following a period of slower growth when coffee was still the dominant crop. By mid 1971 the predicted growth had materialised. Costa Rica: "Provisions del desarrollo economico y social 1969-72 y planes del sector publico"

(v) in Nicaragua: there is no plan but for the early nineteen sixties there was a very substantial expansion based on cotton (over 10% p.a. receipts increase for 1962-67).

Some crops have favourable prospects, notably bananas. Others have served as a considerable source of growth, notably cotton, but also sugar. "In this connection as in many others in economic analysis, aggregation is a tool which has greater power than finesse".(1) Only in the coffee industry is the scene generally bleak and future prospects are inhibited by the terms of the International Coffee Agreement and past overproduction leading to surpluses. Part of the ~~trouble~~ is that coffee is still profitable at existing prices and existing export taxation plus quotas are an inadequate constraint.(2) The general problem is supply inflexibility as much as demand deficiency for there are many alternative lines of production such as meat, forest products, seafoods, fruit and vegetables with good export prospects and ecological suitability.(3) There are, however, problems with these "new" products:(4) competition from established producers, health regulations, transport and marketing problems, lack of responsiveness of traditional landowners.(5)

What cannot be doubted is the continued importance of the commercial agricultural export sector.(6) Traditional exports still contribute well over 15% of regional GNP directly (not counting multiplier effects),(7) is the major source of foreign exchange. The precise point

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(1) M. Flanders: "Prebisch on protectionism" op. cit. p.346.

(2) World Bank Report (1967) Vol. I. Main Report, p. 12-14.

(3) R.M. Stern: "Policies for Trade and Development", International Conciliation No.548 May 1964.

(4) See page 43.

(5) "Latin America"; Oct. 1971 refers to the large scale misuse of World Bank development funds by cattle ranches in Central America as being typical of efforts to diversify in the large-farm commercial sector.

(6) However, it is also of note that recent discoveries of bauxite (Costa Rica) and nickel (Guatemala) will introduce a new source of foreign exchange earnings.

(7) The Guatemalan Plan 1969-72 p.30 makes an assessment of the multiplier for exports as 3·6 as compared with 2·72 for Government consumption and 1·28 for Government investment. These figures seem improbable, and more plausible values are discussed in ch. 3.

at which one should continue to invest scarce resources (capital, skilled labour and also seasonal labour) in this sector rather than manufacturing is ideally a matter for a general equilibrium programming model.(1) However, in the absence of such planning tools one can merely say that there is a predisposition to believe that at least after an initial infant-industry period, resources could be more productively employed in manufacturing than in traditional exports, where there are diminishing returns, especially in Guatemala and El Salvador. There is some, if qualified, support for accelerated industrialisation, from "terms of trade" deterioration.

Export Instability

The other basic objection to specialisation of production in primary products for the world market is that it results in excessive "instability". Indeed, the World Bank introduce their survey of the Central American economies by saying "variations in exports which have constituted 18-22% of GDP in the last decade have markedly influenced investment, imports and national output".(2) It is argued that these fluctuations are inevitable given the commodity concentration of trade; and the low price elasticities of demand as well as the uncertainties in [illegible] in supply which are characteristic of the main export products.

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(1) Consideration of potential returns to scarce factors is in marked contrast to the "vent for surplus" approach to the traditional export sector - which assumes an infinitely elastic supply - and which requires abundant land and zero opportunity cost for the employment of factors. Hla Myint: "The Classical theory of international trade in underdeveloped countries" Economic Journal 1958 p.317.

(2) World Bank Report (1967) Vol. I Main Report: Summary & Conclusions p.(i)

However, recent empirical work (notably by McBean) has cast considerable scepticism on the degree of severity of this problem in general:[1] "while not denying that problems of export instability can be serious for some countries, recent statistical work in the field has cast doubt on the frequently argued premise that the magnitude of fluctuations in export earnings of LDC's is significantly larger than that of developed countries and has questioned the seriousness of the damage caused by export instability to LDC's in general".[2] MacBean made a study of 45 LDC's and 18 DC's over a twelve year period using a Coppock index (the log variance about a trend curve). In all cases the figure is below that for the average of the LDC sample and even below that of the DC sample.

Diagram I-5 showing measurement of instability of export values by Coppock index

I. MacBean			II Erb. and Shiavo-Campo	
All countries (mean)	21·8	(St. Dev. 11·5)		
45 LDC's	23·1	(St. Dev. 12·9)	LDC sample (mean)	13·4
18 DC's	17·6	(St. Dev. 7·1)	DC sample	6·2
Costa Rica	14·3		Costa Rica	12·6
Guatemala	10·7		Guatemala	9·9
Honduras	16·1		Honduras	13·2
Nicaragua	14·2		Nicaragua	14·6
El Salvador	13·9		El Salvador	8·4

(1) A. MacBean: "Export Instability and Economic Development" London 1966 also J. Coppock: "Concentration in International Trade", New York 1962. B. Massell: "Export concentration and fluctuation in export earnings: X-section analysis". American Economic Review March 1964 pp.47-63.

(2) A. MacBean. Ibid.

Further tests have been carried out over a longer time period (1946-66) using the MacBean sample and index.(1) The "stability" of the developing countries export proceeds is even more emphasised.

In every case except Nicaragua the economies are more "stable" than in the MacBean study, and all five economies are more "stable" than the USA, France or Australia. It is still possible to argue that the measurement of instability used is defective, as there are different measures.(2) However, Kingston using a different measure (the average % deviation) shows that the Central American economies with one exception, have more stable export proceeds than a 112 world sample average or a 19 Latin American country average over 1948-65, while Venezuela, Brazil and Argentina have much worse problems.(3) The evidence of MacBean and others is equally negative when they try to correlate instability with the stability of the economy in general, or to specific components of it, i.e. regarding the effects rather than the degree of instability. The author ran a correlation between changes in export earnings and changes in GNP over the 1950-67 period.(4)

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(1) G. Erb and S. Shiavo-Campo: "Economic Instability level of development and economic size of LDC's." Oxford Institute of Statistics 1969 pp.263-283.

(2) Unpublished paper by Susan Turnbull, Glasgow University.
J. Clark Leith. "A decline in world export instability: a comment" Oxford Institute of Statistics August, 1970. He uses "deviations from a connected linear trend" as a measure of instability and finds significant discrepancies from other measures.

(3) R. Kingston: "Instability and Export Proceeds of Selected Latin American Countries, 1948-65". PhD. 1970 (Microfilm).

(4) This procedure ignores lags, which may be significant.

Correlation coefficients

Honduras ·47 (significant at 90% of confidence).

Costa Rica ·15

Guatemala ·36 (significant at a 90% level of confidence).

San Salvador ·33 (significant at a 90% level of confidence).

Direction of fluctuations

Honduras (12 out of 17 fluctuations the same way)

Costa Rica (7 out of " " " " "

Guatemala (12 out of " " " " "

San Salvador (7 out of 16 " " " "

Except for Honduras (which also has consistently high instability indices) these are rather poor correlations though the results are of limited value because of the approximations and smoothing which (one suspects) distort the official national accounts.

One is inclined to treat the "instability problem" as not of serious dimensions. Some of the instability, which is of quantities rather than price, is absorbed domestically by buffer stock arrangements, marketing board policies and counter cyclical policy, but in fact there is no evidence that these are vitally important. More probable is the stabilising influence of expatriate ownership (in bananas especially) which can ensure that some instability of export proceeds is borne by head office and is not reflected in the receipts of the local operation.(1)

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(1) Also much of the instability which existed generally prewar has been largely eliminated by successful counter cyclical policies in the richer countries: L.E. Stekler: "Effects of U.S. Business Fluctuations of Inputs of Primary Commodities" Yale Economic Essays - Vol. 9 No.2 1969 pp.202-289

Central American central banks also hold smaller reserves than most other countries.

	Reserves as % of GDP		as % of Imports			
	1961	1971	1961	1971		
All	5	6·6	41	53		
Western Hemisphere	3·8	4·6	36	46		
←	El Salvador	4·4	6·4	21	30	
←	Guatemala	5·3	5·0	40	33	
←	Honduras	3·2	3·1	17	10	

Source: IMF Financial Survey.

The two most important arguments for a reorientation of development away from agriculture, namely the alleged secular deterioration of terms of trade and instability of the main export crops, have been dealt with and the latter, if not the former, were found not wholly convincing in this context. But pessimism about commodity exports has led to a rethinking of overall development strategy based on one hand on restructuring (towards new exports and/or industry) and on the other to more self-sufficiency and less trade. The import-substituting industrialisation (I.S.I.) approach covers both simultaneously. Diversification on the supply side to produce new agricultural exports is another possible strategy.

Traditional Agriculture

Another possibility is import substitution with an emphasis on agriculture, effecting a transformation of the traditional food producing subsistence agriculture and food producing commercial sectors,(1) using productivity raising inputs such as fertilisers, extension services, farm machinery and improved seeds. Without doubt there is an unsatisfied demand for locally produced foodstuffs and this has split over into imports in the past as can be seen below; though it should be stressed that there is no economic argument for self-sufficiency in foodstuffs rather than any other sector.

Diagram I-6 showing imports of foodstuffs from outside Central America; and intra-regional trade in foodstuffs

	Outside	Intra-trade
1959	58·6m	18·1m
1961	61·6m	18·4m
1966	71·6m	55·1m

Source: "El Commercio Regional de la Production Agropecuario en Centro-America" SIECA. 1968.

(1) About half the overall Central American agricultural production is destined for the local market; $623m. out of $1,250m. in 1965, but it is difficult to separate out food and non-food elements.

To substitute these imports would save substantial foreign exchange and of the $72m. spent in 1966, $30m. was on cereals, $8m on dairy products, $4.2m on livestock food, $5m. on salt, $2m. on fish, and a good deal of this could be substituted locally at least in the long run. Critical observers have long recognised the basic stagnation and weakness of the traditional agricultural sector which is a consequence of the 'dualistic' nature of the economy.(1) Not only has the traditional sector been neglected technologically, but its earlier efficiency undermined by the loss of better land to the plantations, by competition (from imported wheat for example) and by the disruptive effect of seasonal plantation labour (which used to be forced) on the efficiency of foodstuff production.(2) The Central American economy became sucked into a vicious circle: "the producing sector was left with an insufficient amount of resources to maintain a reasonable degree of self-sufficiency ..... and in the absence of government measures ..... food shortages were met increasingly with imports from abroad ... these policies tended to perpetuate the isolation of the food sector from the money economy and to favour the production of export crops".(3)

Of the various factors which contribute to the present defects of subsistence production are small land-holdings, poor soils, archaic methods of production, lack of credit and "the most important because of the pervasive nature of its impact is that of land tenure. Studies testify to the under utilisation of fertile acreage among many large holdings and

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(1) The "dualism" of Central American agriculture is described in relation to Guatemala's coffee economy in K. Griffin: "Reform and Diversification in a coffee economy-the case of Guatemala" in P. Streeten (Ed.) "Unfashionable Economics: Essays in Honour of T. Balogh". Weidenfeld 1970 pp.75-98

(2) C. Castillo, op. cit. pp. 38-42. The general magnitude and effect of migrant seasonal labour (in Guatemala) is described in R. Adams "Crucification by Power" Austin, Texas, (1970) pp. 124-137.

(3) C. Castillo, op. cit. p. 43.

the over-intensive cultivation of poorer soils among the smaller farmers".(1) But this naturally raises political issues which strike at the basis of the power of the ruling groups in Central America which is largely vested in land ownership.(2) Suffice it to say that in the present political and social structure, traditional agriculture is unlikely to respond rapidly to productvity raising inputs.

To some degree there is no conflict between emphasis on industry and simultaneously in traditional agriculture. There is some complementarity in respect of inputs b: ought in by industry and also in so much as the better income distribution resulting from land reform and investment in peasant agriculture would lead to a higher demand for consumer goods, while increased incomes from industry would lead to a higher demand for foodstuffs.(3) This is one of the components of the "balanced growth" approach to development.(4) But there is a conflict too, over the allocation of scarce capital resources: agriculture could not be expected to prosper with land reform alone, only with the application of feeder roads, drainage systems, storage facilities, rural education and irrigation.(5) Also the protection (rather than subsidisation) of either

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(1) R. Hansen: "Central America. Regional Integration and Economic Development" National Planning Association, Oct. 1967 p. 11.

(2) The sociology of Central American interest groups is discussed in J. Nye: "Central American Common Market" Carnegie Endowment for International Peace, International Peace, International Conciliation No. 562 New York, 1967.

This matter is discussed in greater length in Appendix III.

(3) B.F. Johnston & J. Mellor: "The role of agriculture in economic development A.E.R. 1961 pp. 566-593. As far as food stuffs are concerned some additional demand will certainly be required since even if all the overseas imports could be substituted this would only add 10% to the present agricultural product destined for local markets (i.e. about $700m).

(4) R. Nurske: "Problems of Capital Formation in Developing Countries" 1953.

(5) United Nations: "A Central American Common Market for Agricultural Commodities" Economic Bulletin for Latin America Vol. VIII No. 1 1965 p.11.

agriculture or industry would tend to turn the terms of trade against the other. As the level of protection of consumer goods is very high and that on newly produced agricultural inputs (e.g. fertilisers; machetes) is significant, it is probable that with industrialisation the deterioration would work against the peasant.(1) As with the agricultural export sector, the trade-off between investment in traditional agriculture and manufacturing is not clear. But until there is a major political change relating to the Central American countryside it is likely that any comparison would be unfavourable to the traditional agricultural sector.

Labour - absorbtion by Industry

There are several other arguments that have been advanced for an accentuation of industrial development. One is the existence of a pool of 'surplus labour' in the agricultural sector which diminishes the productivity of agriculture and can only be used efficiently by withdrawing it from agriculture. A moderate form of this argument is that the marginal productivity of labour is lower in agriculture than elsewhere (usually assumed to be the 'modern' industrial sector). Another version is that the marginal productivity is zero or negative in agriculture.(2) Labour is abundant, capital scarce; and with a rising population,

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(1) I. Little, T. Skitovsky and M. Scott: "Industry and Trade in Some Developing Countries" OECD 1970 p.346-47.

(2) A. Lewis: "Development with unlimited supplies of labour" The Manchester School of Economics and Social Studies; May 1954 .. G. Jorgensen: "The Development of a Dual Economy", Economic Journal, June 1961, pp.309-335. Fei and G.Ranis: "Development of the Surplus Labour Economy", Homewood 1964. The argument is summarised, criticised and updated by B.F. Johnston: "Agriculture and Transformation in developing countries: a survey of research: Journal of Economic Literature, vol.7, 1970.

a limited area of fertile land and fixed production coefficients there is a deterioration of the situation over time especially under conditions where over-use of the land produces erosion. Labour saving technical innovations (tractors or the "green revolution" high yield seeds) improve the yield of a fixed acreage of land, and add to the pool of surplus labour. If (unskilled) rural labour has a zero social opportunity cost, its transfer to industry, at whatever money cost, is justifiable: "in as much as the output of industrial products can be increased by an underveloped country without reducing the output of agriculture then this is a net gain in real income to the economy. And this is regardless of the inefficiency of the industry since the alternative is to let resourses stand idle".(1) Protection (or subsidisation) enters this argument in as much as market pricing is held to overstate the opportunity cost of labour (because of maximum wage legislation or unionisation) so disfavouring industry : protection of industrial value added would (indirectly) offset this imbalance.(2)

Does Central America conform to a surplus-labour model? First, the population is employed overwhelmingly in agriculture (Diag.I-7a). As far as unemployment is concerned there is little statistical data and little attempt by governments to draw attention to the existence of unemployment in their plans or statistical reports.(3) Open unemployment

(1) S. Dell: "Trade Blocks and Common Markets", London, 1963, pp.192.

(2) E. Hagen: "An economic justification for protectionism", Quarterly Journal of Economics, November 1958 pp.494-514.

(3) Of the 1969-72 Plans only that of Costa Rica even discussed the manpower implications of forecasts made (pp.91-101).

Diagram I-7a showing officially registered unemployed as a percentage of the "economically active" population (A) and as a percentage of the population (B)

	A	B	
Guatemala	1·5% (1964)	·7%	
El Salvador	5% (1961)	2·4%	(8% in San Salvador of economically active; 1961-68).
Honduras	6% (1961)	2·8%	
Nicaragua	1·7% (1963)	·8%	
Costa Rica	6·8% (1963)	3·4%	

Source: SIECA; Quinto Compendio Estadistico 1967 Cuadro A - 1·05 Unemployed in the City of San Salvador from p.20-22, Indicatores de Conaplan April - June 1969.

Notes: the "economically active" population consists of people over 10 years: for Costa Rica it is 12 years and over.

Diagram I-7b showing "activity rates" of men and women: "economically active" personal as a percentage of population in a given age group.

		1950	1964	1968
Guatemala:	Total population:	2,790,000	4,285,000	(4,900,000)
	Economically active	968,000	1,317,150	(1,480,000)
		34·5%	31%	(30%)
		1950	1961	1969
El Salvador	Total population	1,856,000	2,750,000	3,330,000
	Economically active	653,000	807,000	807,000
		35%	29%	(24%)
		1950	1961	1968
Honduras	Total population	1,368,000	1,885,000	2,360,000
	Economically active	647,000	568,000	?
		47%	30%	?
		1950	1963	1968
Nicaragua	Total population	1,055,000	1,535,600	(1,840,000)
	Economically active	330,000	476,000	(800,000)
		31%	31%	(32%)
		1950	1963	1969
Costa Rica	Total population	800,000	1,336,000	1,520,000
	Economically active	281,000	400,000	469,000
		35%	30%	31%

Source: International Labour Organisation Statistics.

Notes: "Economically active" does not include students and housewives and family workers.

Diagram I-7c showing labor force distribution of CACM countries, by class of worker, latest census.

Class of worker	Guatemala 1964	Honduras 1961	El Salvador 1961	Nicaragua 1963	Costa Rica 1963
All classes					
Number (thousands)	1,292·2	568·0	807·1	475·0	395·3
Per cent	100·0	100·0	100·0	100·0	100·0
Employers	4·3	1·4	1·9	30·3	3·5
Self-employed	30·2	37·9	21·7		18·3
Wage earners and salaried employees	45·9	39·8	67·0	56·2	65·3
Unpaid family workers		16·4	7·9	13·2	10·0
Not classified	19·6	4·6	1·5	·3	3·0

Note: Because of rounding, sums of individual items may not equal totals.

Source: National population censuses.

is not high (Diag.I-7a) but in the cases where statistical data is more reliable (Salvador & Costa Rica) there is indication of 8-10% unemployment in the capital city, and E.C.L.A. believes that the "open" rate doubled from 2·5% to 5% from 1955 to 1965.(1) Participation rates are low and generally declining (Diag.I-7b): in part this is due to a greater amount of education amongst the 10-15 year olds, but in Honduras and El Salvador the large falling off in participation rates is due mainly to women withdrawing from the labour force.(2) There is an abundant indirect evidence of underutilisation of labour: In Honduras well over one half of those "economically active" are unpaid - "family workers" or self-employed. Then there is the waste of time due to seasonal fluctuations in activity in the country side: "there are no published and available historical data on the length of work per year in any of the Central American countries and there was very little information on the length of the working week",(3) but evidence suggests that both are short.(4) The unemployment equivalent is estimated by one source at between 30-40%(5)

(1) United Nations (E.C.L.A.). Annual Report (1970) p.59.

(2) The overall participation rate in Latin America (1950-65) has remained steady at about 35% of the population.
Estaban Ledeman: "Towards a policy on Rumen resources in the economic and social development of Latin America": ILPES Chile 1968 p.10.

(3) U.S. Department of Agriculture, Batelle Institute: "Projections of Supply and Demand for Selected Agricultural Products in Central America through 1980". 1969 p.10.

(4) Evidence summarised in Irv. Beller: "Latin America's unemployment problem". Monthly Labour Review Nov. 1970. The U.S. Dept: of Labour Report 345, "Labour in the Central American Common Market Countries", notes that in Costa Rica 47% of the economically active population are idle for up to 8 months.

(5) "Elementos para la elaboracion de una policia de desarrollo con integracion para America Latina" ILPES Santiago 1968, (p.9) and
Manuel Gollas-Quintero: "Underemployment and the marginal productivity of labour in the traditional sector of the dual economy in Guatemala". Ph.D. Wisconsin (1967) (Microfilm). A recent publication; E. Thorbecke & A. Stoutjesdyk, "Employment and Output: a Methodology Applied to Peru and Guatemala".(OECD 1971), estimated that effective labour use in Guatemala was 56-70%.

Diagram I-8: showing changes in employment by sectors (1) (by % of economically active).

		1950	1964	Latest Estimate 1966
Guatemala	Primary Agriculture	68·4 (68·2)	66	64·5 (62·0)
	Secondary Manufacture	14·3 (11·5)	14	16·5 (14·1)
	Tertiary	17·3	20	19·0
El Salvador	Primary Agriculture	64·1 (63·8)	59·5 (59·4)	60·5
	Secondary Manufacture	15·6 (12·3)	17·7 (12·8)	17·1 (12·8)
	Tertiary	20·3	22·8	22·4
Honduras	Primary Agriculture	77·6 (76·8)	63·8(2) (63·5)	66·0(3)
	Secondary Manufacture	11·2 (9·4)	11·1 (8·5)	10·5
	Tertiary	11·2	25·1	23·5
		1950	1964	1967
Nicaragua:				
	Primary Agriculture	68·7 (67·7)	59·6 (58·7)	58·0
	Secondary Manufacture	14·2 (11·4)	15·7 (11·7)	18·8
	Services	17·0	24·7	23·2
		1950	1964	1966
Costa Rica:				
	Primary Agriculture	55·9 (55·6)	49·0 (48·7)	48·0
	Secondary	16·6 (11·5)	18·6 (11·6)	20·4
	Services	27·5	32·4	31·6

Sources: UN Demographic Year Book 1955 (for 1950)
World Bank Report (1962) Vol. II Statistical Appendix Table 6 (for 1964) and Datas Basicas de Poblacion en America Latina 1970.
1969 figures for El Salvador from ILO Yearbook.

Notes: (1) Primary sector includes agriculture, mining, forestry, fisheries. Secondary includes manufacturing; construction and utilities. Tertiary includes commerce, banking, government personal services, transport (except for Guatemala where transport is a 'secondary' activity).

(2) ECLA adjustment for agriculture employment.

(3) Approximations of the Inter American Development Bank.

However, the model of endemic surplus labour, and the related problem of factor price distortion conflicts with local experience in several ways and furthermore industrialisation is not an entirely self-evident solution. First, rural labour does not have a zero opportunity cost in as much as seasonal peak labour requirements on plantations are substantial; a "paradox of scarcity with underutilisation of labour".(1) Second, employment is not 'costless' as complementary inputs such as capital and skills, housing and infrastructure are required and may be under-valued both when used by plantation agriculture and industry, and may make the labour supply less elastic.(2) Third, it is very doubtful if the marginal productivity of labour is zero in rural areas even if we ignore seasonal requirements from plantations. It assumes extreme land scarcity so that returns to the fixed factor have in fact become negative, but in Central America land is not universally scarce and rectification of the uneven distribution of land-ownership would release considerable unused "hacienda" land. Fourth the 'factor price distortion' may work more decisively in terms of a 'traditional v. modern' sector analysis rather than for 'agriculture v. industry' in as much as modern industry like the plantation sector, has access to cheap credit from expatriate banks, duty free inputs of capital goods etc. and 'traditional' or artisan industry which is substantial in Central America does not, but has access to

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(1) C. Castillo: op. cit. p.43. Unskilled labour is in great demand between November and March; in Nicaragua and Guatemala for cotton; in Costa Rica for sugar, coffee and cotton. This phenomenon has given rise to the notion of "labour-slack" rather than "surplus labour". L. Reynolds; "Economic Development with surplus labour: some complications" Oxford Economic Paper March 1969 pp.89-103.

(2) The crucial importance of skilled labour is emphasised in H. Myint: The Economics of Developing Countries" London 1964 p.137 and W. Baer and M. Harve, "Employment and Industrialisation in developing countries", Quarterly Journal of Economics Feb.1966, p.100.

cheaper non union (often family) labour on similar terms to much of the agricultural sector.(1) Fifth, and related to the last point, the considerable range of capital-labour intensities within the manufacturing sector means that the possible "absorbtion" of labour by industry will depend on which sector within industry we are discussing. Many 'intermediate' industries like chemicals have a very high (and relatively fixed) incremental capital-labour ratio(2) and even modern light industries could result in a net loss employed of labour if they displace existing artisan producers operating very labour-intensive processes.(3) The employment available may vary considerably in composition and unskilled male local labour maybe a relatively small component of that demanded. Therefore, the argument is not one of 'agriculturev. industry' but a more specialised argument about factor proportions in different sectors and projects. Central American experience (as far as can be seen) is not conducive to the view that 'modern' industry can absorb the supply of 'surplus labour'. From Diag.I-9a. it can be seen that the rate of growth of manufacturing employment is much less than the growth of output and less even than the growth rate of population. The rate of increases of employment is greater

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(1) In the manufacturing sector the % of employment in manufacturing contributed by the artisan sector was (in 1960) Guatemala 64%, El Salvador 56%, Honduras 70%, Nicaragua 76%, Costa Rica 56% i.e. the majority, (bearing in mind the doubtful nature of much of the statistical material; and the arbitrary classification of artisan establishment as having 5 or under employees).

(2) There is an enormous disparity between marginal and average capital-labour ratios. The average industrial investment is about $150-200 per working person, but in 1960 it was estimated that new investment per worker in manufacturing predicted by the development plans was: Guatemala $3,000m; El Salvador $2,400; Honduras $2,200; Nicaragua $4,000; Costa Rica $7,200.

(3) Whole industries like glue, rope and shoes are exceedingly vulnerable to this kind of substitution of modern for traditional techniques. Other industries such as textiles, basket-making, carpet and blanket-weaving, pottery and jewellery; all exist in Central America and have been adversely affected by competition from the "modern sector". However there is an inevitable conflict between the need for higher productivity and efficiency on one hand (especially if exporting is envisaged) and full employment. After all "any society, if it could rid itself of enough technique and capital, could keep everyone of its ambulatory members fully employed grubbing for roots and berries" (A quote of J.P. Lewis reproduced in United Nations "The need for an Export-Oriented Pattern of Industrialization" Industrialization and Productivity No. 14.

Diagram I-9a showing average annual increases in employment by the three main sectors (Agriculture, Industry & Services) during the 1950's & 1960's.

Country	Output	Population Increases	Employment		
Costa Rica (1950-63)	4·3%	4·0%	Agric. 2·1%		
			Industry 4·1%	Total	
				2·9%	
			Services 4·2%		
Honduras (1950-64)	2·8%	3·2%	Agric. 1·2%		
			Manu. 2·1%		
			Services 16%		
				Total 2·9%	
Nicaragua (1950-63)	4·2%	3·2%	Agric. 1·8%		
			Manu. 3·3%		
			Services 5·6%		
				Total 2·8%	
El Salvador (1950-69)	3·3%	2·9%	Agric. ·9%		
			Manu. 2·1%		
			Services 1·8%		
				Total 1·2%	
Guatemala (1950-64)	5·3%	3·2%	Agric. 1·93		
			Manu. 2·12		
			Services 3·3		
				Total 2·3%	

Source: the National Development Plans.

Diagram I-9b showing Sectoral Productivity Differences (product per man employed in current $).

	1960			1970		
	Agriculture	Industry	Services	Agriculture	Industry	Services
Guatemala	44·6	115·7	311·4	42·2	134·8	261·6
El Salvador	55·6	128·8	188·4	46·3	150·8	182·3
Honduras	61·8	192·3	197·6	57·5	252·0	146·6
Nicaragua	60·2	135·2	191·0	49·8	155·7	169·2
Costa Rica	51·4	132·7	169·6	45·4	157·1	150·1

Source: E.C.L.A. 1970 Annual Report

in industry than agriculture with a much greater increase in output; which can be explained part by capital intensive processes. Taking the region as a whole, between 1950 and 1968 the industrial product rose by 6·8%; industrial productivity by 4·1% and thus employment in industry by 2·7%. On the other hand there are indirect benefits because of the derived demand for construction services and agricultural inputs which may make industrialisation seem more generally a good generator of employment.

Commercial agriculture absorbed only a small fraction of the increased labour force, partly as a result of slow growth, partly because the large plantations do not, for many crops, employ labour intensive techniques. In practice 'surplus labour' was absorbed in small part in industry and more in the urban "service sector", street peddling, domestic service, shining shoes and other forms of underemployment which are visible in the capital cities of most developing countries: the service sector "is largely a sponge which absorbs the excess population of the rural areas and its growth represents virtually no increase in economic welfare".(1) The productivity of the service sector (on average) is, with industry, much higher than of agriculture (Diag.I-9b) but less so at the margin.

There may be a good argument for subsidising the more intensive use of unskilled labour relative to capital (in industry, agriculture, construction or whatever) in order to correct for any factor price distortion, but this would not necessarily result in an industrial bias and indeed practical experience in most developing countries is conducive to pessimism regarding the role of industrialisation.(2) Nevertheless in the absence of revolutionary changes in society, there is an immediate problem of employing the urban underemployed in productive work and industrialisation (with related services and supplier sectors) offers the only avenue open.(3) And the situation is continually deteriorating: in 1970, unemployment (recorded) had risen in El Salvador to

(1) A.K. Griffin: "Reflections on Latin American development" Oxford Economic Papers March 1966, p.2.
(2) D.Seers: "The role of industry of development: some falacies", Journal of Modern African Studies 1965, p.464.
UNIDO: "Recent overall progress in industrialisation achieved by developing countries" U.N. Bulletin of Industrialisation and Producivity No.13 p.11.
(3) This position is adopted by others nevertheless sceptical of the direct contribution of industry: R. Sutcliffe: "Industry & Development" Oxford 1971 p.58.

10·5%, double that of 1961.

External Economies

One of the most powerful and frequently repeated arguments for greater emphasis on manufacturing industry is that industrialisation brings in its train substantial "externalities", such that there is a divergence between social and private returns justifying government subsidy or protection for the sector in general. Whereas internal economies of scale in one plant or firm can be dealt with in an essentially static framework , the existence of "external economies" can be used to constitute a case for industrialisation in general. 'External economies' rigorously (and statically) defined refer to the effect of the expansion of one firm resulting in reduced input costs (or increased input efficiency) to another firm; but the notion has been used more generally to refer to "the most important contribution is not its (industry's) immediate production ..... and immedicate social benefits but perhaps even further, its effect on the level of education, skill, way of life, inventiveness, habits, store of technology, creation of reward."(1) Others have argued that because of the "primitive" nature of the economies of many developing countries the scope for external economies is greater than in advanced economies.(2) But on the other hand high cost production creates direct "external diseconomies" and competition for scarce factors puts up prices of scarce factors generally and creates bottlenecks. Furthermore the existence of external economies cannot be confined to manufacturing and is likely to be manifest in construction, electricity, gas, transport, services etc. though they are probably unimportant in the primary producing sector.(3) Nor can externalities be quantified and this limits the usefulness of the concept.

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(1) H. Singer: "The distribution of gains between investing and borrowing countries", American Economic Review Papers & Proceedings, May 1950, pp.473-485. A distinction is usually made between "pecuniary" and "technological" externalities (T.Skitovsky: "Two concepts of external economies" Journal Political Economy 1954, pp.146-151). The former refers to the effect on the level of skill technical knowhow, etc., on cheapening costs.

(2) H.W. Arndt: "External economies in economic growth" Economic Record, Nov. 1955, p.202. M. Fleming: "External economies and the doctrine of balanced growth". Economic Journal, June 1955, p.249.

(3) P.Bardhan: "External economies, economic development and the theory of protection" Oxford Economic Papers, March 1964, p.52.

Another point of the argument concerning "external economies" is the theory of linkages of Hirschmann.[1] It is argued that industry has a uniquely powerful role in setting up "linkages" or "input/output" connections, backward to the producers of inputs and forwards to those industries of which the product is an input. To give an example, the establishment of a caustic soda plant in Central America should provide an incentive to produce soap and paper pulp which use caustic soda intensively and should enable economies of scale to be reaped in electricity supply which is a major input. However, in some cases local production may discourage a forward linkage industry if it is protected and raises the price of the input; nor is there any guarantee that backward linkages will be formed locally rather than overseas. In practice the establishment of 'screwdriver' assembly industries tends to lead to research and labour intensive (and scale sensitive) production being done elsewhere. In small countries with few input-output connections one would not realistically expect demand to be mutually reinforcing.[2] An attempt to give some empirical backing to these generalisations was made by drawing up a crude input-output table for the manufacturing sector based on the very limited material available. The author constructed a table based on 1967 data from El Salvador and an earlier table for Costa Rica is simplified and reproduced. (Diag. I-10a and 10b). Though one would question the meaningfulness of the coefficients which are based on static assumptions and on doubtful data (N.B. the large residual, "others"), It is clear that there are many blanks in the table and most coefficients are very small, even if intraregional trade transactions are considered. The scope for substantial "linkage" formation is not at all clear from the table. The situation is even less helpful in agriculture: total material inputs (for Guatemala) were estimated at 9.2% in Guatemala; mostly fertilisers.[3]

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(1) A. Hirschmann: "The Strategy for Economic Development", Yale University, 1958, Ch. 6.

(2) A. Hirschmann: "The political economy of import-substituting industrialisation in Latin America", Quartlery Journal of Economics Feb. 1969 pp.1-32.

(3) C. Fletcher, E. Graber, W. Merrill & E. Thorbecke: "Guatemala's Economic: the role of Agriculture" University of Iowa, p.23.

Diagram I-10a Input-output linkages in the Manufacturing Sector of El Salvador

Origin \ Destination	Food	Drink	Tobacco	Textiles	Clothes	Timber
Total Production '000	116,000	49,000	18,900	159,200	28,300	667
Agriculture inputs	.24	.0075	.1412	.389	—	.060
Imports	.096	.0653	.0261	.076	.337	.0260
"Others"	.006	.0322	.0021	.034	.053	.0132
Manufacturing Sectors						
Food Products	1.0577	.0433				
Drink		1.0000				
Tobacco			1.0000			
Textiles				1.0	.0801	.0132
Clothes; shoes					1.0023	
Timber						1.0000
Furniture						
Paper products						
Printing						
Leather					.1091	
Rubber products					.019	
Chemical products	.0165			.0001	.0067	.0396
Petroleum	.0076	.0085		.0004	.0006	.0040
Minerals	.0002					.0016
Non-metal						
Metals						
Metal products						
Mechan. Engin.						
Electrical Engin.						
Transport						
Misc.						

Origin \ Destination	Furniture	Paper Products	Printing	Leather	Rubber Products	Chemicals	Petroleum Products	Non-metal minerals
Total Production '000	13,300	14,450	16,150	7,590	4,756	73,761	—	19529
Agriculture inputs	0198	—	—	.280	—			—
Imports	290	.58	.480	.282	.319	.3173	—	.0809
"Others"	.0209	.0020	.019	.0035	.091	.0313		.0522
Manufacturing Sectors								
Food Products								
Drink								
Tobacco								
Textiles	.0115	.601		.0009	.0001		—	
Clothes; shoes					.0130			
Timber	1.0000							
Furniture		1.0007	.0857					
Paper products			1.0000					
Printing				1.0114	.0011		—	
Leather					1.0021			
Rubber products								
Chemical products	.0114	.0615	.0053	.0118		1.0259		.0002
Petroleum	.0001		.0044	.0011	.001	.0002		.0022
Minerals	.002						—	1.0697
Non-metal								
Metals				.0023				.0016
Metal products								
Mechan. Engin.							—	
Electrical Engin.								
Transport								
Misc.								

Origin \ Destination	Metals	Metal Products	Mechanical Engineering	Electrical Engineering	Transport Engineering	Miscellaneous
Total Production '000	13,800	2082	1,330	2184	7,265	25,736
Agriculture inputs	—	—	.024	—	—	
Imports	.6251	.055	—	.423-	—	.423
"Others"	.0037	.035		.0089	—	.007
Manufacturing Sectors						
Food Products						.0084
Drink						.0001
Tobacco						.0001
Textiles						
Clothes; shoes					.0102	
Timber		.0009	.0122	.0005	.0023	.0035
Furniture	.0014	.0036	.0600	.0001	.0020	.0018
Paper products	.0012	-	.0022			.0010
Printing	.0088	.0182	.6244			
Leather		1.0000				
Rubber products			1.0000			
Chemical products				1.0000		
Petroleum					1.0000	
Minerals						1.0000
Non-metal						
Metals						
Metal products						
Mechan. Engin.						
Electrical Engin.						
Transport						
Misc.						

Notes: 1. the coefficient includes regionally imported as well as locally produced goods.

2. only four decimal places considered.

Sources: El Salvador industrial census statistics, as reproduced in the statistics of the Planning Ministry (1967).

Diagram I - 10b Input - Output Linkages in the Manufacturing Sector of Costa Rica (1957)

Origin \ Destination	Food	Drink	Tobacco	Textiles	Clothes & Shoes	Timber	Furniture	Paper	Printing	Leather	Rubber	Chemicals	Cement	Electrical & Mechanical Engineering	Construction Machinery	Diverse Manufacturers
Food Product	1.0976	0.0680	0.0135	0.0008	-	-	0.0002	0.0095	-	-	-	0.0834	-	-	-	-
Drink Products	-	1.0710	0.0067	-	-	-	0.0023	-	-	-	-	0.0023	0.0006	-	-	-
Tobacco	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Textiles	0.1226	0.0008	0.0002	1.0379	0.0188	-	0.0233	0.0001	-	0.0036	-	0.0009	-	-	-	-
Clothes & Shoes	-	-	-	-	1.0032	-	-	-	-	-	-	-	-	-	-	-
Timber	-	-	-	-	0.0008	1.0084	0.2258	-	-	-	-	0.0031	0.0050	0.0051	0.0463	.1610
Furniture	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Paper	0.0064	0.0004	0.0001	-	-	-	-	1	0.0012	-	-	0.0011	-	-	-	-
Printing	0.0024	0.0112	0.0272	-	-	-		0.0137	1	-	-	0.0198	-	-	-	-
Leather	-	-	-	-	0.1138	-	-	-	-	1.1270	-	-	-	-	-	-
Rubber	-	-	-	-	0.0100	-	-	-	-	0.0043	1	-	-	-	-	-
Chemicals	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Cement	-	-	-	-	-	-	-	-	-	-	-	-	1	0.0015	-	-
Electrical & Mechanical Engineering	0.0052	0.0003		-	-	-	-	-	-	-	-	0.0027	-	1.0001	-	-
Construction Machinery	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Diverse Manufactures	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

'Industry Preference'

Bearing in mind the heavily qualified case for Central America industrialisation under each of the heads discussed, does this constitute an argument for protection on a regional or national basis, on non-static grounds? To some extent this is less a question of 'yes' or 'no' but of degree. There is a clear difference of emphasis between Nurske who argued for protection qualified to cases where tariffs were modest and no disincentive to exports, and the earlier writings of Prebisch which endorsed more indiscriminate industrialisation.(1) The basis of much modern writing on the theory of customs unions is that whether or not the governments are correct to adopt an industrialisation strategy, the fact is that many or most developing countries do in fact regard industry as a "collective consumption good" and this is taken as given. "Concern is bound to concentrate on the potentialities of a customs union for increasing the industrial output of the country and the efficiency of its industrial production rather than on the potentialities for satisfying private consumption demand at lower cost by increasing imports, but to regard these inputs as a cost rather than a benefit."(2) Cooper and Massell erect the basis of a "general theory of customs unions" for developing countries on the premise: "We do not attempt to examine the conditions under which a protectionist policy makes good sense; rather we accept industrialisation as a legitimate policy goal and consider how membership in a customs union may enable a less developed country to achieve more economically the ends served by protection.

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(1) Prebisbh: "Economic development of Latin America: its principle problems". His later writings seem to show more sensitivity to the costs involved: "Towards a Dynamic Development Policy for Latin America" U.N. (E.C.L.A.)1965 p. 71.

and R. Nurske: "Patterns of trade and development" in "Equilibrium and growth in the World Economy, 1961.
This difference of view as highlighted by B. Balassa: "Regional integration and trade liberalisation in Latin America:" Journal of Common Market Studies, Sept. 1971 p. 59.

(2) H.G. Johnson: "An economic theory of protectionism", Journal of Political Economy, June 1965 p. 280.

Specifically we assume that economic planners in a less developed country may be willing to accept some reduction in national income to achieve an increase in industrial production".(1) Johnson evolved a similar theoretical framework simultaneously, based on the ideas of Breton and others.(2) Both represent an attempt to reach an optimal solution under second-best assumptions.

One way of quantifying the "industry-preference" notion is to use the concept of "normal" levels of industrialisation. It has been shown that there are some general patterns in the level and structure of manufacturing industry and in the composition of manufactured imports, which take place as the result of different rates of growth in the demand and supply of different products as a country progresses.(3) In the two most important studies, of the United Nations and Cheney, regression equations were derived by X-section analysis which "explained" the level of industrial value added and its structure by the variables of per capita income, and size of country (population size as a proxy).(4) These results have been used in several cases to decide on the "D" or "degree of industrialisation", the actual manufacturing value added as a proportion of that predicted; the assumption being that any difference must be attributable to something specific such as policy orientation.(5) These

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(1) C. Cooper and B. Massell: "Towards a general theory of customs unions for developing countries"; Journal of Political Economy, Oct. 1965 pp.742-47.

(2) H.G. Johnson: "An economic theory of protectionism, tariff bargaining and the formation of customs unions". Journal of Political Economy 1965 pp. 256-83.
A. Breton: "Economics of Nationalism" , August 1964 pp. 376-87. American Economic Review

(3) H.B. Chenery: "Patterns of industrial growth" Sept. 1960 pp. 624-54.
United Nations: "A Study of Industrial Growth", New York, 1963.
S. Kuznets: "Quantitative Aspects of the Economic Growth of Nations" Economic Development and Cultural Change (Supplement) 1957.

(4) The general equation is of the form;
Log Vo = ao + bo log y + co lop P where Vo = manufacturing value added per capita in £m. x 10^6 at 1953 prices.
Y = income per capita at 1953 U.S. dollars.
P = population in millions.
bo = income elasticity of manufacturing output.
co = population elasticity of manufacturing output.

(5) As for example in A. Stoutjesdijk: "Normal Patterns of Industrialisation in East Africa" Makerere Papers no. 360, 1966(unpublished)
and
S.R. Lewis: "Economic Policy and Industrial Growth in Pakistan", [illegible], London 1969.

equations were used to tell us something about "D" in a Central American context bearing in mind that the exercise is frought with methodological, statistical (and logical) difficulties. These, and the results, are fully discussed in Appendix 2. The calculations in the Appendix show that until 1967 and later, all Central America countries were substantially "under-industrialised", with the possible exceptions of El Salvador, in terms of the index "D". At a sectoral level the direction of the deviations give an indication of strong bias in development; generally towards "traditional" food, tobacco, textiles and clothes, and away from "intermediate" and "capital" goods. One must treat the findings of this type of comparative analysis with considerable reserve, the equations are after all of no normative or causal significance, but merely represent the best fit of a large sample at one moment in time. However, the figures do appear to justify the view that industry is deficient in Central America for the size and income level of the five countries, and within the manufacturing sector there is a deficiency the "non-traditional" lines of production.(1)

In Central America industrialisation has always been assumed to be the main object of the common market. In 1956 when the CACM was being conceived, a local economist wrote "the case for economic integration depends primarily on industrialisation".(2) Whether or not this doctrine is correct is not proven. However, it is not crucial whether or not it is correct in order to justify the existence of economic integration only that the policy makers believe it to be correct.

Different Approaches to Industrialisation

The connection between the case for industrialisation and that for economic integration is that integration lowers the economic cost below that which would prevail in a national market where economies of scale cannot be exploited to the full.

(2) B. Hoselitz: "Economic Development in Central America", Weltwirtshafts Archiv. 1956 pp.267-308.

(1) It should also be stressed that much of Central America's current industrial production is in very small artisan establishments (five or fewer workers). In 1962 in Central America, there were 150,000 industrial workers in factories and an estimated 210,000 artisan employees; with a value added per capita of only one quarter.

However, there are various steps in the argument which need to be scrutinised; (i) first, could not an expanded market not be achieved by exporting manufactures to the world market (if necessary with the aid of subsidies)?

(ii) second, are the possibilities for import substitution in a national market exhausted, assuming an inward looking pattern of development?

(iii) third, can economies of scale be realised best within a customs union or common market arrangement?

Exporting Manufactures to the World Market

Manufactures could be expanded by subsidising exports or protecting import substitutes with tariffs. On a purely theoretical level, with perfect markets, homogeneous products, perfect knowledge and certainty, nascent industry would be better protected by subsidies because there can be identical production effects without adverse consumption effects to domestic buyers. It is also argued that subsidies should be used in preference to tariffs in correcting factor price distortions (like overpriced labour).(1) On a practical level subsidies have been supported on two grounds. First because high tariffs tend to have not only adverse consumptions effects for domestic buyers, but for other industries whose costs are pushed up and whose export competitiveness is consequently eroded.(2) In as much as expensive tariff protection also leads to overvalued currencies exporting is further handicapped. Secondly it is argued that in many contexts less foreign exchange is saved by import substitution than if the same scarce factors were employed in exporting. This is because it is

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(1) H.G. Johnson: "Optimal trade intervention in the presence of domestic distortion" in R.E. Baldwin et al: "Trade, Growth and the Balance of Payments", Chicago 1965.
J. Bhagwati & V. Ramaswami: "Domestic distortions, tariffs and the theory of optimum subsidy" Journal of Political Economy, Feb. 1963.

(2) I. Little, T. Skitovsky & M. Scott: "Industry and Trade in some Developing Countries" op. cit. pp.128-144.
P. Streeten: "The Case for Export Subsidies": Journal of Development Studies, 1968 pp.220-253.

administratively easy to impose tariffs even to the extent of highly inflationary "promiscuous protection" [1] while export subsidies require government expenditure and impose a fiscal burden.[2] There are also strong GATT objections to export subsidies for reasons that are not particularly related to the problems of developing countries.[3] Because tariffs are so easy to impose, relative to subsidies, levels in many semi-industrialised Latin American countries are very high. There are many horror stories - nominal tariffs of several 100% and effective tariffs even higher.[4]

Little, Scitovsky and Scott estimated that an average 20% effective protection rate for manufacturing was probably justified to allow for the effect of externalities and factor price distortion; certainly no more.[4] But even a protectionist like Prebisch has been moved to remark "the criterion by which the choice was determined (in many countries in Latin America) was based not on considerations of economic expediency, but on immediate feasibility, whatever the cost of production.[5]

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(1) J. Viner: "International Trade and Economic Development", Oxford 1957, p.41.

(2) This is not so much an economic as an administrative problem. Even there, the difficulties are probably exaggerated. Taxes could be raised on other commodities [illegible] anyway, import substitution also leads to loss of revenue because of import duties forgone and only partially offset by excise duties. Another great virtue of subsidies in this connection is that reluctance to extend them may lead to continuing government supervision of efficiency in the subsidised enterprise in a way that tariff protection does not. In this they combine the virtues of planning and the price mechanism.

(3) Article 24 of the General Agreement on Tariffs and Trade.

(4) United Nations: "Customs duties and other import charges and restrictions in Latin American countries: average levels of incidence"; Multilateral Economic Cooperation in Latin America 1952 vol.I. pp.106-123.
S. Macario: "Protectionism and industrialisation in Latin America" Economic Bulletin for Latin America, March 1964 p.61.
T. Scitovsky: "Prospects for Latin American Industrialisation within the framework of Economic Integration: Bases for analysis" in "The process of Industrialisation in Latin America" Inter-American Development Bank, 1969 p.37.
I. Little, T. Scitovsky and M. Scott, op. cit. pp.158-9.

(5) R. Prebisch: "Towards a Dynamic Development Policy for Latin America", op.cit. p.71.

It is a little difficult to fit Central America into this picture. It has high nominal tariffs but in Appendix 4 this is shown to be very misleading.(1) Various suggestions have been made for trying to obtain the effects of an export subsidy while not having the necessity for extensive government expenditure: one of the more ingenious is for devaluation coupled with consequences would be identical to a subsidy without additional expenditure.(2) The major problem which it would face is that (like subsidies) it would probably not circumvent the major non-price obstacles to exports. Exporting new products requires good entrepreneurship and risk taking. Import substitution is easier: "imports provide the safest and most incontrovertible proof that the market is there".(3)

The difficulties involved in exporting to industrial markets can be seen if we consider the two different types of manufactured goods in which Central America might specialise; first processed goods and raw materials, and second, labour-intensive "traditional" industries.(4) In the first case, several reports have argued that there are potential markets for exports of products such as processed fruit and vegetables, frozen meat, wood products,(5)

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(1) This is because of "water" in the tariff: See also J. Flanders "Measuring protectionism and predicting trade diversion", Journal of Political Economy 1965 pp.165-169.

(2) D. Schydlowsky: "From import-substitution to export promotion: for semi-growing industry: a policy reappraisal" Journal of Development Studies, July 1967 pp.405-413.

(3) A. Hirschmann: "The Strategy for Economic Development" Yale 1958 p.212.

(4) The general problems are reviewed in R. Vernon: "Problems and Prospects of Exporting Manufactured Goods from LDC's". Papers and Proceedings of UNCTAD. Vol. IV: "Trade in Manufactures" pp.200-210.
H.B. Lary: "Imports of Manufactures from Less Developed Countries" New York 1968 pp.1-10.
B. Balassa: "Trade Prospects for Developing Countries" Illinois 1964 Ch.3 and 12.

(5) (Eldrick & Lovidge) Economist Intelligence Unit "Report on potential new manufactures" (restricted). United Nations: "Short and medium term prospects for exports of manufactures from selected developing countries": Central American Common Market countries": TB/B/C. 2/61 May 1969.

and some diversification into these industries has already occurred with the production of banana puree, ($1m of exports from Honduras), shrimps (El Salvador) and meat.(1) However, there are serious problems on the supply side of sustaining adequate quantity and quality (a management constraint essentially) and problems on the demand side of selling in a highly specialised, distant and discriminating market.(2) A.U.N. study commented: "marketing and financing problems of exports are those which are noted with the greatest emphasis for almost all the products ... whereas on the contrary the "price" factor of products would not constitute an obstacle of very frequent significance e.g. at the present time soluble coffee enterprises are running at 30% capacity utilisation because of marketing (rather than price or supply) problems."(3)

A second type of enterprise which could in theory be established locally would be those using "cheap labour", such as textiles and clothing. However, these products face import restrictions in the industrialised countries, income inelastic markets and severe competition from Asia where countries combine lower wage costs with higher productivity. Some interest has been shown in producing in developing countries standardised labour-intensive components of complex capital goods such as computers and automobiles which have a rapidly rising demand and face no restrictions on imports into the large markets for which multinational company strategy dictates overseas low labour cost production. This is in contrast to the less cosmopolitan interests of

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(1) Joint Planning Mission: "Programa de diversification de las exportaciones en Central America", Nov.1964 e.g. exports of chilled meat products have risen from $1. in 1957 to $25m in the mid 60's.

(2) For these reasons the Eldrick and Lavidge study was pessimistic about exploiting many of the products which from a superficial inspection had a good local resource endowment and excellent markets, such as: clothes; tobacco, timber cabinets; flowers and fresh fruit; electrical components. This is in addition to problems presented by obstructions to trade, particularly tariffs which discriminate against processed products.

(3) United Nations: "Short and medium term prospects" op. cit. p.61.

industrialised country producers in the traditional industries.(1) However, Central America does not have overwhelming advantages as a "cheap-labour" producer. The unskilled semi-skilled labour costs in expatriate firms in Hong Kong and Formosa is as low as 10c per hour: in Central America average semi-skilled wages vary from 18c (Nicaragua) to 27c (Costa Rica)(2) while productivity is variable and the ports are poor.(3) Continuity of supply is a dubious prospect in the light of the region's political instability, and this perhaps is crucial as individual components of an electronics assembly unit may be small as a proportion of cost but indispensable technologically. It also assumes a willingness to accept subordination to the global strategy of multinational companies; and to production patterns technologically determined by the state of evolution of the product cycle.*

One cannot, therefore, expect too much from this alternative approach, and it may be that export industries, at least of the second kind, are better developed when proved successful in domestic or regional markets, as "Janus-faced-industries" facing inward and outward simultaneously.(4) Indeed, it is often argued that "the most effective base for the export of manufactures is in a large domestic market".(5) However, one of the main criticisms of an import substitution approach was that it led to high costs and discouraged exports.

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(1) G. Hirsch: "Location of Industry and International Competitiveness", Oxford 1969.
R. Vernon: "International investment and international trade in the product cycle". Quarterly Journal of Economics May, 1966, pp.202-207.

(2) World Bank Report on Central America (1967) op. cit. Vol.4 (Industry) pp. 60-61.

(3) United Nations: "Carrateras, Puertos y Perrocarillas de Central America" E/CNI2/CCE 324, 1965.

(4) D. Pearson: "Industrial Development in East Africa", Nairobi 1969 pp.66-68.

(5) D.B. Keasing: "Outward looking policies and economic development", Economic Journal, June 1961 p.87.
S. Linder: "An Essay in Trade and Transformation", Uppsala 1967 pp.303-31.

* This line of development is described in G. Hellaner: "Exports of Manufactures and Multinational Companies" Economic Journal March 1973 pp. 21-48. He points out that for Mexico and even for the small Central American countries there is already a major expansion being experienced. The author is willing to accept that this

Johnson has argued that given that firms are established to supply an existing market, they are unlikely to become exporters since the existing market typically consists of a large variety of goods whereas successful exporting for a small country typically demands concentration on quantities of products for a limited range of standard lines.(1) One may, therefore, be faced with a stark alternative of trying to develop manufacturing exports or "if in an underdeveloped country the stocks of productive factors is growing, but if development through increased exports to advanced industrial sectors is blocked for any reasons there arises a possible need for promoting increases in output that are diversified in accordance with domestic income elasticities of demand so as to provide markets for each other locally in contrast to output expansion which is specialised according to comparative advantage."(2) Can this be done nationally or is there need for a regional market?

Import Substitution Nationally?

Superficially, there would appear to be a good deal of scope for import substitution on a national basis. Imports per capita were $47.5 in 1966 as compared with $4.5 in India and $29 for Africa as a whole. The regional import ratio (excluding regional trade) stayed in the range .18 to .21 in the period 1950-62 and has kept at that level since.

One method of assessing the scope for national and regional import substitution is to assess the proportion of supplies provided from domestic production. An attempt has been made to show this. However, the terminology and concepts in the field of 'import substitution' are somewhat tangled.(3)

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(1) M.G. Johnson: "Tariffs and economic development: some theoretical issues", Journal of Development Studies 1968 p.25.

(2) R. Nurske: "Equilibria and Growth in the World Economy" in "Economic Essays by Nurske", G. Harbeler (ed.) p.319.

(3) Attempts to sort out the conflicting definitions are made in C. Winston: "A Preliminary survey of import substitution" Williams College, Sept.20,1965. P. Clark: "Planning Import Substitution" North Holland 1970 pp.25-28. Pyatosh Maitra: "Import Substituting potential in East Africa" East African Institute of Social Research Occasional Paper No.2 Makere 1967 1967 pp.7-9. P. Des ai: "Alternatide measures of import substitution": Oxford Economic Papers 1969 pp.317-324.

Import substitution is sometimes defined in absolute terms;(1) sometimes as a relative concept; relative to total supply;(2) to domestic consumption expenditure;(3) total incomes;(4) domestic expenditure minus services; domestic value added. In each case the calculation will be different. The definition used here will be that of Maizels where import substitution over a period of time (i to o) is given by

$IS = (mi - mo)\ so$ where s is the aggregate supply (i.e. production plus import).
where m is the import content of total supplies.

$D = mo\ (si - so)$

which is the difference between what total supply (domestic output and imports) would have been had the ratio of imports to local supply remain unchanged, and actual total supply: any other change in imports is explained by changes in demand. This method of analysis is subject to considerable methodological criticism.(5)

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(1) W Baer and I Kerstenetzky: "Import substitution and industrialisation in Brazil", American Economic Review. Proceedings and Papers 1964 p.417, measures import substitution by the percentage decline (or increase) in the constant dollar values of imports by categories. This is criticised in, J. Sakomoto: "Medicion de las repercussions del proceso de industrialisaction sobre la economica. Un analysis critico del model Baer-Kerstenetsky". Trimestre Economico (Mexico) April-June 1969 pp.247-271.

(2) A. Maizels: "Industrial growth and world trade" op. cit. pp.522-523.
H.B. Chenery: "Patterns of Industrial Growth" op. cit. pp.625-653.
M. Steuer & C. Voividas: "Import substitution and Chenery's patterns of industrial growth: a further study" Economia Internazionale 1965 pp.47-77.
J. Ahmed: "Import substitution and structural change in Indian manufacturing industry" Journal of Development Studies, 1968 pp.350-379.

(3) B. Havelock & C. Thomas: "Dynamics of West Indian Integration". University of the West Indies.

(4) N. Leff and A. Netto: "Import substitution, foreign investment and international disequilibrium in Brazil". Journal of Development Studies, 1966 pp. 218-234.

(5) This definition and related measures have the following basic deficiencies. Firstly, over a long time period, the import ratio is likely to change, particularly in respect of individual sectors, as the region's economic structure and consumption patterns change, quite regardless of any import substitution. Secondly, sectoral analysis for intermediate and capital goods has limited quantitative significance because of interdependence between sectors: import substitution of finished consumer goods generates a demand for intermediate and capital goods which was hitherto implicit in the consumer goods and which now have to be met by a diversion of domestic supply or by explicit importation. Therefore, to replace an import, production must rise not only in the final processing industry but also in the industry supplying its inputs and in their supplier industries in their turn. Therefore, conventional measures of import

(cont)

I-11

Diagram showing the extent to which the apparent consumption of manufactures was domestically produced in the pre-integration period; taking the Central American region as a whole and (for 1962) naturally.

	1953	1956	1959	1962	Guat.	El.Salv.	Hond.	Nic.	C. Rica
Traditional manufactured goods.									
Food	.86	.86	.88	.92	.93	.91	.83	.99	.84
Drink	.94	.95	.94	.95	.97	.96	.95	.94	.92
Tobacco	.98	.98	.98	.99	1.00	.99	1.00	1.00	.98
Textiles	.36	.44	.48	.54	.74	.70	.13	.48	.39
Clothes	.83	.83	.90	.90	.92	.96	.89	.93	.88
Timber	.83			.88	1.00	.51	1.00	1.00	.91
Furniture	.91	.83	.88	.92	.96	.92	.88	.81	.97
Printing	.82	.69	.84	.84	.94	.79	.71	.73	.78
Other Manu.	.17	.19	.21	.33	.45	.28	.35	.15	.35
Sub Total	.82			.87					
Intermediate goods									
Pulp and Paper	.12	.10	.15	.30	.44	.43	.17	.63	.18
Rubber products	.38	.37	.38	.47	.86	.48	.20	.13	.22
Chemicals	.34	.32	.36	.39	.37	.37	.44	.27	.35
Petroleum Products	-	-	-	-	-	-	-	-	-
Non-metallic minerals	.58	.68	.66	.71	.79	.73	.80	.68	.46
Sub-Total	.37			.44					
Capital Goods.									
Basic Metals	.00	.00	.00	.00	.08	.11	.00	.00	.00
Metal Products	.17	.20	.25	.35	.44	.43	.19	.38	.27
Machinery	.02	.02	.03	.04	.04	.05	.05	.00	.07
Electrical Machinery	.05	.10	.09	.10	.15	.10	.05	.07	.08
Transport Equip.	.14	.13	.20	.21	.18	.25	.20	.14	.29
Sub-Total	.10			.15					
Overall:	.60			.67					

Sources: Derived from tables published by the Joint Planning Mission.

Notes: Apparent consumption is production plus imports minus exports; domestic supply is production minus exports. Intra-regional trade is self-cancelling and is ignored. Figures are expressed in terms of an index 1.

Diagram showing import substitution in the Central American region (as a whole) in terms of the relation between the volume of imports and domestic supply over the period 1953/56 to 1963/5 ($m;)

Traditional Goods	Contribution to manufacturing domestic production of Change in Demand 1953/55 to 1963/65	and Import-Substitution of 1953/55 to 1963/65	Change in Demand (1965-69 Plans)	Import-subs
Food	+27	+35		
Drink	+ 2	+ 2		
Tobacco	-	-		
Textiles	+30	+19		
Clothes	+2	-		
Timber	+1	+ 3		
Furniture	+16.5	-8.5		
Printing	+1	-		
Leather	-2	+3		
Diverse manufacture	+2.3	-7		
Traditional	+90	+46.5	+62.9	+10.3
Intermediate Goods				
Pulp and Paper	+3.5	+2.6		
Rubber (Tyres)	+ 7	+2.0		
Chemicals	+81	-7.8		
Petroleum	+25	-		
Non-metal minerals	+6.5	+5.5		
Intermediate	154.5	+2.3	+136	+126
Capital Goods				
Basic Metals	+25	+1.1		
Metal Products	+13	+15.2		
Machinery	+50	+4.2		
Electrical Machinery	+24	+1.0		
Transport Machinery	+48	+1.0		
	+160	+22.5	+116 +315	+ 34 +170
Total	+404.5	+71.3		

Notes: Impot substitution and change in production due to demand, calculated by Maizels Method.

Sources: La estadisticas basicas del sector industrial 1950-62. Joint Planning Mission.

import substitution overall. The main influence on the level of domestic supply were changes in the level of demand which were offset only to a small extent by import substitution, most of which was in the "traditional" food-stuffs and textiles and to a lesser extent (later) from oil refining and metal products.

At national level there are some differences. The scope for import substitution in "traditional" industries is greatest in Honduras and greater for textiles in particular in Nicaragua and Costa Rica than in El Salvador and Guatemala.

But the main implication is that the main scope for import substitution is in the non-traditional industries: "We are moving into the stage of import substitution in respect of intermediate and capital goods or durable consumer goods, which, besides being difficult to manufacture, require markets much larger than those of the individual Latin American countries."(1) At this level import-substitution has to be seen in a regional rather than a national context. An attempt was made by the OAS to calculate the implications (explicit and implicit) of the 1964-69 plans for import substitution at a regional rather than a national level i.e. additional import substitution (taking the region as a whole) made possible by the Common Market.(2) It was foreseen (and correctly) that the gross import substitution relative to domestic supply would in 1969 amount to $340m (1962 prices) of which $200m would be substitution through regional trade.

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(1) R. Prebisch: "Towards a Dynamic Development Policy for Latin America" op. cit. p.6.

(2) Pan American Union: "Report on the Central American National Development Plans and the Process of Economic Integration" 1965-69 pp.82-89.

It is interesting to relate this back to the traditional theory. A policy of regional import-substitution is now seen as based on "trade diversion", which is no longer regarded as a cost: trade diversion is almost the very essence of the customs union. "The point at issue is not whether the new producer is more or less efficient than the former one. The question is rather whether it is not more advantageous to buy a commodity from a new producer than to waste foreign exchange on importation from an advanced country."(1) Trade "diversion" is seen as a necessary consequence of mobilising unemployed resources and raising real income; of utilising spare capacity and saving foreign exchange.(2)

There is little doubt that by the end of the 1950's Central America like most of Latin America had reached the end of the phase of "easy" import substitution and need to move into the production of intermediate and capital goods and consumer durables where economies of scale are important,(3) and where production would only be economic in a larger market.

Economies of scale in a regional market

There is a superfluity of definitions where economies of scale are concerned, but what we are initially referring to are the empirically observed economies in average cost with increased capacity internal to the plant.(4)

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(1) S. Linder: "Trade and Trade Policies for Development" op. cit. p.126.

(2) One might qualify this in respect of trade "diversion" from other developing countries with identical problems.

(3) "Central America: industrial policy problems". Economic Bulletin of Latin America 1964 op. cit. pp. 120-121.

(4) The role of economies of scale is discussed in great detail in Ch.5 and so much of the definitioned and descriptive material is omitted here.

A large market is necessary for many products to prevent either sub-optimal scales of investment or underutilisation of optimal capacity for excessive periods (or simply non-investment); and this needs to be considered in a dynamic context in which 'minimum' scales are increasing with technological advance.

There is a good deal of evidence in support of the importance of economies of scale in manufacturing.(1) But generalisations need to be heavily qualified as empirical findings have suggested that for large ranges of capacity economies of scale are unimportant, the average cost curve being horizontal after a relatively small range in which declining costs are manifest; and in many individual products there is an absence of economies.(2) One cannot strictly generalise and as, Mikesell comments, "the possibilities for realising economies of scale differ greatly for different types of commodities for the same market and for the same commodity for countries of varying market size."(3)

However, while accepting reservations about the magnitude of internal economies of scale, their existence is not and in many industries they are probably very substantial. Economies of scale are important in a Central American regional market for several reasons:

(i) first they allow certain new industries to be established whose minimum economic size (or 'threshold') due to indivisibilities is above that of national markets but below that of the regional market.(4) If these industries could be

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(1) See Ch. 5.

(2) A negative view (stressing the limited role of scale economies) is given in R.L. Allen: "Integration in less developed areas" Kyklos 1961 pp. 232-324. A balanced summary of the argument is given in R. Halevi "Regional Integration and Industrialisation of LDC's" UNIDO ID/Conf.1. 1/11/1969.

(3) R. Mikesell: "The theory of common markets and developing countries" op. cit. p. 218.

(4) This is a once and for all benefit. Once plants within this size range have been installed any further expansion of market size can only come from economic growth or income distribution.

established there would be not only an efficiency gain but income gain from the mobilisation of unemployed resources. Various studies were carried out in the early nineteen-sixties to identify possible industries of this kind; glass bulbs, flat glass, caustic soda, chlorinated insecticides, rayon, tyres and tubes, flat glass, caustic soda, chlorinated insecticides, rayon, tiles and tubes, fertilisers, copper wire and cable and possibly sulphuric acid, electrolytic copper, plastic raw materials and electrical appliances.(1)

(ii) in some cases, plants which would have been established anyway, can now be built at lower cost in a regional market. This is particularly true of process industries where the plant has continuous economies of scale in the lower size ranges.(2) Most of the case studies reviewed later in the thesis come under this heading e.g. estimates by the Economic Commission for Latin America for the pulp and paper industry showed that the cost of a metric ton of paper pulp decreased from about $250 per ton at a capacity of 50 tons per day, to about $150 per ton at a capacity of 200 tons per day. Another study by ECLA showed the importance of economies of scale in the steel industry. Increasing the capacity per annum from 100,000 to 1,500,000 tons, the total cost of pig iron decreased from $55 per ton, that of steel ingots from $95 to $96 per ton and of flat rolled products from $235 to $121 per ton.(3)

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(1) United Nations (ECLA) "Possibilities of Integrated Industrial Development in Central America": New York, 1963: 63.I.G.1). J. Moscarella: "Economic integration in Central America" in M. Wionczek "Latin American Economic Integration" op. cit. p.275.

(2) T. Skitovsky: "International trade and economic integration as a means of overcoming the disadvantages of a small nation" in EAG Robinson (Ed.) "Economic Consequences of the Size of Nations" MacMillan 1963.

(3) United Nations (E.C.L.A.): "Programming data and criteria for the pulp and paper industry", and "The steel industry in Latin America" both included in "Report of the Latin American Symposium on Industrial Development" Santiago (Chile) 1966.

(iii) there are also economies of scale to be derived by existing industries, in part by consolidation of existing units, but also when technical economies are exhausted: "outside of a few exceptional industries most technical economies are exhausted by firms of the maximum size to give full, or almost full, technical efficiency. But in industries of this kind, often where the product is hetrogeneous, there may be gains from interplant specialisation; as in textiles and clothing."(1) Recent literature has stressed this very considerable and neglected aspect of intra-industry specialisation as a source of economies of scale in regional groups.(2)

In these industries, where product differentiation is important, multi-product firms can specialise in a narrower range of products and have longer production runs; benefitting from economies of scale through specialisation, 'learning by doing' and better capacity use. For example in 1958-60, many firms in the traditional industries were operating at very low rates of capacity use(3) "current sales in the Central American countries are in the zone of 25-50% of capacity. Economies of scale are a fact of life in Central America. The Industrial Census of Costa Rica (1957) showed soft drinks to have a rate of capacity utilisation of 30% shoes 20%, and, vegetable oil/metal furniture 40%"(4)

Evidence on capacity use is from Diagram I-13. Generally, the rate is about $\frac{2}{3}$ but it varies with the definition (regarding shifts for example) and by sector.

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(1) E.A.G. Robinson: "Economic consequences etc." op. cit. Introduction p.XVii.

(2) H.G. Grubel: "Intra-industry specialisation and the pattern of trade": Canadian Journal of Economics and Political Science, August 1967 pp.374-388 also "The theory of intra-industry trade" in McDougall & Snape (Eds.) "Studies in International Economics" and M. Adler: "Specialisation in the Coal and Steel Community" Journal of Common Market Studies 1969 vol.8. p.179.

(3) The latter refers to economies of scale in the economic 'short-run' - different from the conventional definition of economies of scale. Also one should be careful not to leap to conclusions. Poor capacity use could be explained by supply problems such as poor management.

(4) C. Staley: "Costa Rica and the Central American Common Market": Economica Internazionale, Feb. 1962 pp.112 and 117-20.

Diagram I - 13 Utilisation of Capacity in the Factory Sector 1962.

	I	II (All sectors)	III (All sectors)	(III) Textiles	(III) Chemical Products
Guatemala	.75	.64	.71	.67	.86
El Salvador	.73	.64	.71	.94	.81
Honduras	.63	.63	.70	.60	.56
Nicaragua	.82	.81	.90	.97	.52
Costa Rica	.72	.55	.61	.63	.41

Note

I is by declaration of the firms themselves

II by percentage of capacity (in theory)

III by percentage of capacity, effectively utilisable

Source : Joint Planning Mission.

Taking these various different elements of 'economies of scale' together "there seems little doubt that a pattern of industrialisation based on greater specialisation within the regime will be more economical than one based on production by each country for its own domestic market".(1) However, this specialisation will not occur spontaneously. To maximise economies of scale requires the "creation of a mutually supporting complementary industrial structure within a regional framework" which in turn necessitates "a combination of national and regional planning to accomplish the goal of a more complementary industrial structure".(2) The necessity for intervention is made greater by the fact that 'restructuring' and the new investment may favour some partners rather than others and an equilisation mechanism may need to be imposed. Considering these various aspects Cooper & Massell stated that gains from integration would be greatest;

(i) the steeper the marginal cost of protection.

(ii) the stronger the "industry preference".

(iii) the greater the degree of complementarity between the economies in resource endowment and existing industrial structure.

(iv) If neither partner has a cost advantage, intra-union, in all or most industries.(3) This is necessary in order to ensure that one partner does not unduly benefit or suffer from integration.(4)

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(1) R. Mikesell: "The theory of common markets as applied to regional arrangements etc." op. cit. pp.209-210.

(2) H. Kitamura: "Economic theory and the economic integration of underdeveloped regions" in M. Wionczek (Ed.) "Latin American Economic Integration" op. cit. p.56.

(3) R. Cooper and B. Massell: "Towards a general theory of customs unions for developing countries", Journal of Political Economy Oct. 1965 pp.461-7.

(4) The 'distribution' question is dwelt with at length in chapters 3 and 4. Perhaps the clearest attempt to incorporate it within a basic customs unions theory is in D.C. Mead: "The distribution of gains in customs unions between developing countries" Kyklos vol. 21 (1968)pp. 713-36.

The Cooper and Massell framework also enable some precision to be introduced into what could otherwise be regarded as an extremely ad hoc form of economic development in which industrial projects chosen at random are made less inefficient by operating in a larger market.

The supply curve for the industrial sector here is a national ranking of industrial projects in terms of their true cost in economic resources (the nature of the demand curve is less clear). Andic, Andic and Dosser have tried to build on this concept and suggest how industrial projects can be ranked on various criterion of cost and benefit (re: employment, foreign exchange, savings etc.).(1)

So far, however, we have been concerned with internal economies of scale. Larger markets may also promote external economies. Some writers neglect this supposition on the grounds that externalities are empirically unimportant, though Jaber has argued that the overwhelming majority of economic gains (in LAFTA) comes from external rather than internal economies.(2) External economies from economic integration manifest themselves in various forms. First, internal economies result in lower costs and this can be passed on in lower input costs; though the opposite would happen if increased industrial activity leads to higher prices for scarce factors and for this reason factor mobility will be necessary to minimise external diseconomies. Second, a larger market may encourage the development of specialisation and skills so increasing the efficiency and lowering the cost of factor inputs. Third, a larger market induces investment by facilitating the formation

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(1) S. Andic, F. Andic & D. Dosser: "A Theory of Economic Integration for Developing Countries" University of York Studies No.6, 1971.

(2) T. Jaber: "The relevance of traditional economic theory to the LDC's", Journal of Common Market Studoes op. cit. also "A theoretical analysis of the dynamic effects of economic integration among LDC's": University of California 1970 Phd. (Microfilm)(Ch.5.).

of linkages locally:" (balanced growth) can hardly be applied to very small scales and lack of variety of resources will preclude the simultaneous establishment of large numbers of industries all producing for the domestic market, however, it can be of some applicability to small LDC's only in the context of economic integration".(1) These backward linkages may in their turn manifest economies of scale so widening the externalities (in electricity and railways for example as well as manufacturing). Certain implications following from giving external economies an important role. The first is to affect consideration of the time horizon: "the creation of a customs union or free trade area usually involved relatively long time periods for fruition so that the initial impact and perhaps the most important one, is on expectations regarding future market opportunities rather than on existing trade patterns".(2) Skills, similarly take long to diffuse. Second, one of the main elements of externalities is the phenomenon of agglomeration, which implies industrial developed clustered around favoured locations rather than evenly spread under laissez-faire conditions. Chapter 4 will deal with this phenomenon in depth but it is clear even from this that trade liberalisation would need to be regulated.

One way of quantifying the overall economies of scale benefit from economic integration would be to use the x-section regressions referred to earlier, by studying the signs and magnitudes of the "size" coefficients. If one contrasts the "normal" industrial value added of the five countries separately with that of the region considered as a single unit then the difference should give some approximation to the "internal" and "external" economies combined of the regional market. The regressions imply that the larger a market (measured by population size) the greater the contribution of manufacturing i.e. a large home market is a significant comparative advantage, which is compatible with our earlier arguments. The bigger and more varied the natural resources, the

(1) W.G. Demas: "The economies of development of small countries with special reference to the Carribean"; McGill University 1965 p.56.

(2) A. Kolinski: "Customs Unions of underdeveloped nations: the case of Central America" Economica Internazionale 1969, pp.130-131.

larger the number of industries likely to be capable of operating under optimum conditions. This exercise has been tried both for the East African union and a possible Australia/New Zealand link.(1) The same was tried in Central America and the following projection obtained for 1970.

Normal value added; five countries collectively = $1050 million.

" " " ; " " separately = $850 million.

The difference of 20% over the sum of separate value added is the potential gain from complete economic union.(2) Part of Appendix 2 is devoted to the calculations in this exercise, and its application to a sectoral level. As with the application of the "normal" equations referred to earlier, there are major doubts about their application for this and related purposes. The Appendix discusses this problem in depth. One of the main difficulties is the assumption that a 'common market' is equivalent to economic union, which sidesteps most of the real-world obstacles to trade such as uncertainty, suspicion, transport cost, product differentiation. The figures may, however, represent a maximum gain.

Elkan has shown how in 1975/76 New Zealand could have 50% more industrial value added in a free trade arrangement with Australia than separately, assuming (a big if) that the benefits from the enlarged market were not reduced by Australia imports to New Zealanders investing in S.E. Australia to take advantage of the larger market by locating nearer to it. Stoutjesdiyk did a study of the possible effects of economic union in East Africa and concluded that an overall increase of 14% manufacturing value added by 1970 would be possible in a regional group, with the main gains in chemicals and metal products.

(1) W. Elkan: "Estimating New Zealand's manufacturing output in a common market with Australia" New Zealand Institute of Economic Research; Technical Memorandum No. 3 (Wellington 1965).
This paper has been attacked in F.W. Holmes: "Trade with Australia" N.Z.I.E.R. Discussion Paper No.10 (Wellington 1966),
also A. Stoutjesdiyk: "Normal Patterns of Industrialisation in East Africa". Makere 196 . (paper No. 360).

(2) The Chenery study also indicates that import needs are inversely related to market size and a larger market could also help thereby to overcome a foreign exchange bottleneck assuming scarce resources were not diverted from the export sector.

The purpose, therefore, of a larger regional market is to minimise the cost of the import substitution of manufactures by enabling internal and external economies of scale to operate, and also to deepen the process of import substitution by encouraging the establishment of new regionally based industries, provided that scarce factors could not have been employed in exporting outside the region at less cost.

One point sometimes advanced by critics of integration is that for traditional manufactures, market enlargement could take place by other means than the formation of a regional group notably by income redistribution. This is an important criticism which is looked at in deal in Appendix 3.(1) Figures are given there for the type of market enlargement that could occur for consumer goods were the spending power of low income groups to be larger. However, it is felt that there is no reason why such a policy should not be supplementary and additional to that of regional integration and there is anyway little political indication of its being realised at present on a substantial scale. The argument also suffers seriously from neglect of supply side factors.(2)

Other Benefits from Integration

The argument so far has been based on economies of scale, internal or external, and the extent to which a regional market makes it easier to realise them. However, there are certain other factors to be considered which might bring gains through the regionalisation of markets:

(a) it is argued that there may be dynamic benefits from competition amongst firms which at national level would be near monopolies.(3) "In

(1) Two articles advancing this line of argument were contained in the symposium edited by R. Hilton: "The Movement Towards Latin American Unity" Praeger 1969;
e.g. D. Solar: "The Case against Latin American Integration: economic and political factors" pp.110-132.

(2) There is however a basic economic difference between enlargement of the market through trade, and though demand-inflationary mechanisms which include

(2) Cont'd.

running a budget def icit, or switching resources from the rich to the poor, who consume proportionately more of their incomes (they may, due to the degeneracy of the rich consume not more or even less! But that is a different argument). The latter approach would suffer from a neglect of supply-side factors since some factors are scarce and demand expansion would in most cases lead to inflation and/or greater net importation.

The effect of market enlargement through regional trade by contrast is structural, shifting resources to manufacturing and capital goods especially; and would increase 'aggregate supply' by opening profitable opportunities for overseas vapital and unproductively used domestic capital. Income distribution might have, incidentally, structural effects of a beneficial kind (switching demand from imported or locally produced capital intensive durables to local labour intensive textiles etc.), but it would also tend to reduce 'aggregate supply' since saving (and investment) would tend to fall, unless there is a speedy and efficient compulsory mobilisation of resources by the state, or better utilisation of capacity where there is genuine "Keynsian" unemployment. In Central America, also, half of consumer expenditure is on food, more for the poor, and pressure of increased demand would be brought immediately on the inefficient supply- inelastic food producing sector; thence inflation in food prices, which land reform per se would not solve. . Other supply-side factors, lack of skills and management, rather than lack of purchasing power, may be important in some contexts. In the absence of a total transformation of society, politically as well as economically, "income distribution" could be considered in no way comparable in its effects.

(3) This argument has been used by T. Jaber (Ph.D. thesis) op. cit. Ch. 6 but has been more commonly employed in advanced market economies; T. Skitovsky "Economic Theory and Western European Integration" Unwin 1958, p.133.

sectors characterised by national monopoly, oligopoly will be the dominant stricture, while in oligopolistic industries the size of the group will increase".(1) In this manner it is possible to limit abuse of the monopoly power that would otherwise be characteristic of economies of scale industries,(2) and force them to pass on "external economies" in lower prices. It is also argued that competition will breakdown complacent and inward looking business practices and improve entrepreneurial quality.(3) In Latin America anti-competitive practices are a pervasive phenomenom: "well equipped establishments operate beside those whose costs are high, in a sort of mutual benefit society, the latter safe-guarding their marginal existence and the former reaping the big profits that accrue from the cost differential".(4) The effect of integration is partly to provide a competitive "jolt", but in the long run, "the benefits are realised as a result of entrepreneurial decisions arising out of the new market structure and out of the acute awareness of the continued generation of new products, new processes and new methods of distribution on the part of the competitors in the new regional market".(5)

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(1) B. Balassa: "The Theory of Economic Integration" op. cit. p.165.

(2) M. Merhav: "Technological Dependence, Monopoly and the Limits to Growth" Oxford 1968,

(3) J. Baranson: "Industrialisation and Regionalism in the Central American Common Market" Inter-American Economic Affairs 1962 (Autumn) p.63.

(4) R. Prebisch: "Towards a Dynamic Development Policy for Latin America" op. cit. p.72.

(5) R. Mikesell: "The theory of Common Markets etc." op. cit. p.205.

However, it has to be accepted that this argument might be in conflict with the case based upon maximising economies of scale gains at a plant level and for "complementary" specialisation; also that it may well lead to a polarisation in gains to the most "competitive" partner state and forced closure on plants in the less competitive states. Also, abuse of monopoly or other anti-competitive practices could be prevented in other ways - by direct controls or lowering the external tariff unilaterally.

(b) there is also the possible gain from engendering more certainty amongst producers especially in those industries where one of the concomitants of economies of scale is a long "lead-time" between the original conception of a project and eventual production. Though original research is unlikely to be significant in the Central American Common Market there are many industries where long term market planning is important: and the effect of economic integration by fostering cooperation, joint planning, breaking down suspicion and increasing knowledge should help to engender optimism about the ability of regional markets.(1) Unfortunately integration agreements - like the Central America - that are marred by frequent ruptures, border closures (and wars) will not achieve these gains.

(c) hitherto we have been entirely concerned with deficiences of market size as a constraint in industrial growth and with the efficient use of available investment. In practice supply factors such as capital and skill may be a more immediate constraint.

A supply of capital constraint is of no real importance when there is underutilized capacity but will be when new investment has to be considered. It is important to see how integration might affect the supply of capital from different sources. Capital could come from domestic or foreign sources, public or private sectors. The relative proportions of these four components

(1) W.E. Gibbs: "The Central American Common Market" Inter-American Economic Affairs 1961 (Autumn) p.65.
also, "With respect to manufacturing products there was an almost total lack of a Central American marketing mechanism prior to 1957....there is a lack of relation between the structure of demand and the distribution of Central American production, which occasionally leads to assumed saturation of a Central American market .... connection will depend on the volume and regularity of transactions". OAS Economic Survey of Latin America 1962, pp.418-9.

I-14a

Diag. A showing the relation between domestic savings (gross) and investment and the role of foreign savings.

	% of GDP 1961			% of GDP 1965-69 Plan.		
	Domestic Savings	Investment	Foreign Savings	Domestic Savings	Investment	Foreign Savings
Nicaragua	14.2	13.1	-1.1	18.9	18.7	-0.2
Costa Rica	16.1	19.1	3.0	19.1	20.6	1.5
Guatemala	7.0	9.6	2.6	10.1	11.6	1.5
Honduras	11.6	12.6	1.0	12.1	16.7	4.6
El Salvador	11.8	11.8	0.0	12.9	14.0	1.1

Source: 1968 World Economic Survey

14b

Diag.I- showing the composition of net domestic savings by private and and public sector (1966-68).

	% GDP Total	Government contribution	Private Savings	Commercial
Costa Rica	8.8	.8	7.6	.3
Guatemala	4.5	1.8	---------- 2.7 ----------	
Honduras	9.0	1.4	7.6	.4

Source: 1968 World Economic Survey

14c

Diag.I- showing the relative role of public and private investment (1962-64)

	% Public Investments	% Private Investments
Guatemala	39	61
El Salvador	20	80
Honduras	21	79
Nicaragua	27	73
Costa Rica	29	71

Source:World Bank Report

I-14d

Diag.showing the relative importance of export earnings, overseas foreign investment and "aid" as sources of foreign exchange (1970) Plan

	Export earnings	Public capital receipts (net)	Private capital receipts (net)
Guatemala	$257 m.	28	10
El Salvador	220	20	5
Honduras	160	19	4
Nicaragua	208	19	4
Costa Rica	196	8	5

Source: National Data.

are shown in Diag 1-14. First, as far as local private investment is concerned (based on local private savings) there would be scope for investing more from any rising real incomes subsequent upon integration (assuming there was no substantial income distribution). However, this fails to take into account the behaviour of the ruling classes: "up to now the main entrepreneurial group has been small and the bulk of domestic private investment has been made by wealthy land-holders who have selected the most promising and least risky situations in their respective countries usually for small-scale investments, while the bulk of their liquid funds has been invested or deposited abroad."(1) Also experience of import substitution policies elsewhere does not provide positive evidence for the supposition that domestic savings and investment rates are affected.(2) Indeed it has been argued that there has been a very high propensity to consume from additional income in recent years.(3) As far as the public sector is concerned the governments are faced with a declining revenue base due to import substitution reducing the taxable imports, a problem accentuated by the process of integration; and in the light of this the scope for financing investment from budget surpluses is reduced. The third element is overseas public sector investment or "foreign aid".

However, a substantial volume of assistance to regional institutions has probably been directed from national projects.(4) The fourth and most important

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(1) J. Pincus: "The Central American Common Market" ROCAP (U.S.A. ID - Guatemala) 1962, p.18.

(2) N. Leff & A. Netto, "Import substitution foreign investment etc." op. cit.

(3) R. Hanson, op. cit. p.87. The ratio of savings to disposable income in Costa Rica fell from 13·3% in 1958 to 9% in 1964 due in part to the liberalisation of consumption induced by domestic durable good production. "As import substitution of consumer goods proceeds there is an automatic decontrol of consumption due to (a) the availability of scarce consumer goods, (b) the fall of government revenue ....". K. Griffin: "Under development in Spanish America" London 1969. p.224.

(4) John F. McCamant: "Development Assistance in Central America" Praeger 1969, Ch.2.

component is private foreign investment. Johnson has argued that the attraction of large markets in encouraging foreign investment is one of the main benefits of economic integration.(1) The particular consequences of greater foreign investment involvement will be dealt with in Ch.4. Central American experience has been that "foreign private capital inflows to manufacturing countries have also apparently increased rather sharply following the establishment of economic integration....."(2)

However the only supply constraint is not the supply of capital. In Honduras particularly the lack of skills, high quality management and infrastructure has long been regarded as an obstacle to investment in the region:(3) in Honduras there have been major regional projects earmarked but have not materialised because of implementation difficulties.(4) Regional integration is helping to eliminate this bottleneck by having the regional institutions to project preparation and industrial research.

(d) Finally, the economics of scale argument is applicable not only to industry but to administration, to infrastructure (power and transportation) and possibly education. Robson argues on the basis of East African experience

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(1) H. Johnson: "Tariffs and Economic Development: some theoretical issues" op. cit. discusses the positive effect on capital inflows of an import substitution policy.

(2) World Bank Report (1967) op. cit. Volume 4 (Industry) p. (viii) of introduction.

(3) OAS Report on Central America; John Hopkins 1962. (Chapter on Central American integration).

(4) e.g. a steel mill, glass factory and pulp and paper factory.

that these economies are as great as in industry.[1] Robinson is more sceptical.[2]

(e) There is another justification for economic integration amongst primary producers, which is that they should band together in order to negotiate more effectively over commodity prices. However, in the International Coffee Agreement the Central American coffee producers have competed vigorously with each other for larger quotas and have not presented a united front. On the other hand the five countries did coordinate their representations to UNCTAD. I & II, and more recently they have cooperated over coffee.

CONCLUSIONS:

What we have evolved is something much more than a theoretical rationale for customs union. The rationale is largely based on the commitment to industrialise the Central American countries, and the hope that integration will cheapen that process. It also has been implied that a good deal more than a customs union is required: that there is a need for machinery to plan the allocation of industrial plants to obtain economies of scale; that mechanisms are required to ensure a spreading of gains between partner states; and that economies of scale will be realised more in the long run than the short run. Ch. 2 and 3 deal with the success of the Central American Common Market in reading these objectives, by creating the relevant insitutions (Ch. 2) and in its actual performance (Ch.3.).

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(1) P. Robson: "Economic Integration in Africa" op. cit. p. 89.

(2) E.A.G. Robinson: "Size of the Nation and the Cost of Administration" in Robinson "Economic Consequences etc" op. cit. p. 238-239.

Chapter II Central American Integration: A Comparative Approach

This chapter is concerned with describing the main elements of the integration process whose rationale is discussed in Ch. I and whose main consequences are discussed in Ch. III and IV. The chapter will try to test two propositions:

(i) that the Central American Common Market "is clearly the most successful example of economic integration that has been undertaken by independent developing countries".(1) The suspicion is that (even disregarding the 'Football War' and its aftermath) this verdict is quite excessively flattering to the region. Nevertheless the impression is widely diffused: two observers have commented that CACM is "one of the most successful examples of economic integration amongst sovereign nations anywhere in the developing states",(2) and "of all the attempts at integration among developing countries of the world, the Central American has been the most successful."(3)

(ii) that whatever its achievements, there is a considerable disjunction between the structure of the CACM and the rationale which indicated that "economic integration of developed countries concentrates on customs policy whereas that of developing countries concentrates on investment policy."(4)

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(1) United Nations: "Trade Expansion and Economic Integration among Developing Countries" UNCTAD UN: TD/8/85/ Rev. 1. p. 15.

(2) U.S. Committee of Economic Development: "Economic Development in Central America" 1964.

(3) Business International Corporation: "The Central American Common Market" New York 1969.

(4) A. Inotai: "The Central American Common Market" Center for Afro-Asian Research, Budapest 1971 p.19.

COMPARATIVE DEVELOPMENT

Rather than describe the operations of the Central American Common Market in isolation it would be more revealing to describe its main features in the general context of the movement towards "subregional integration".(1) In the post war years (2) more than a dozen customs and monetary unions, common markets, free trade areas, regional investment agreements and co-operative arrangements of various kinds have been established. There are several reasons why the subject matter is so fashionable. First there is a considerable "demonstration effect" operating; deriving in part, but not entirely from the EEC "success". For example in the discussion proceding the establishment of the East African Community, economists with Central American experience advised on the applicability of institutions like the Central American Integration Bank.(3) The U.N. agencies now have a substantial "cadre" of specialists in economic integration who advise from comparative experience.(4) Second the "rationale" appears to be well accepted and has the support of the U.N. specialist agencies.(5) With substantial numbers of very small states still becoming independent, and with a general desire, rational or otherwise, among these states for industrialisation, it is accepted that economic integration has a useful role in minimising the cost: "as

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(1) Comparative studies are: M. Wionczek, "Economic Cooperation in Latin America, Africa and Asia". M.I.T. Press 1969. F. Kahnert, P. Richards, A. Stoutjesdijk and P. Thomopoules: "Economic Integration among Developing Countries" OECD 1969, UNCTAD "Trade Expansion and Economic Integration amongst Developing Countries" UN TD/8/85 Rev. 1, 1967.

(2) Customs unions and preferential agreements have a much longer history in fact. The German Zollverein is an early example.

(3) M. Wionczek: "Experiences of Central American economic integration as applied to East Africa": Industrialisation and Productivity Bulletin 11. (United Nations) pp. 15-31.

(4) R.W. Gregg: "The United Nations Regional Commissions & Integration in the Underdeveloped Regions:" in R. Gregg and M. Barlum (Ed.) "The UN System and its Functions:" Princeton 1968. UNCTAD: "Trade Expansion and Economic Integration amongst LDC's."op. cit.

(5) e.g. in the Pearson Report: "Partners in Development" 1969 p. 94, "these efforts to expand trade among developing countries should be supplemented where appropriate by regional trading blocks. Many developing countries especially the samller ones find it easier and more convenient to enter into cooperative arrangements with their neighbours."

Diagram 2-1 Distribution of Countries by Gross Domestic Product and Population Size, 1964

Population in millions	Number of countries according to gross domestic product						
	Under $5,000 million	$5,000-9,000 million	$10,000-19,000 million	$20,000-39.000 million	$40,000-99,000 million	$100,000-299.000 million	Over $300,000 million
Over 300				1			
150-300							1
75-149·9		1	1		1		
30-74·9	1	1	2		3	1	
15-29·9	7	2	2		1		
5-14·9	16	2	4	1			
Under 5	34	3					

Source: United Nations

Notes: The 85 countries in the 1964 (UN members) sample has now expanded to about 120. Only two of the new additions (Bangda-dash and China) would not be in the smallest economic category. Increased population and GNP have also moved the whole diagram bodily to the N-E.

Diagram 2-2 showing the main integration schemes in tabular form

	E.E.C.	E.F.T.A.	COMECON	C.A.C.M.	L.A.F.T.A.	Ansean	Ind. Dairies	L.E.A.E.C.	U.D.E.A.C.	W.A.E.C.	R.C.D.	Magreb	Arab C.M.	A.S.E.A.N.
1. Members	(pre-enlargement) France Germany Neth. Italy Lux. Belg.	(effectively terminated). U.K. Den. Swits. Norway Austria Fin. (Iceland) Swedn. Portugal.	All East Europe + Mongolia and Cuba	El Salvador Guatemala Costa Rica Nicaragua Honduras	All Latin American states except Panama, Central America, Caribbean and Guyana S.	Colombia Chile Peru Ecuador Bolivia (Venezuela Peter)	CARIFTA = Jamaica Guyana Trinidad + Tobago + Associated States	Kenya, Uganda + Tanzania	Cameroon Chad (left 1968) Gabon Congo (Br.) C.A.R.	UDEAO = Dahomey Ivory Coast Mali Niger. Senegal U. Volta Mauretania	Turkey Persia Pakistan	Algeria Morocco Tunisia	Iraq Jordan Syria U.A.R. Yemen. Kuwait Libya	Indonesia Malaysia Philippines Thailand Singapore
2. Population: (approx.) millions 1967	180. (pre-enlargement)	100 (pre-reinstated)	200(?)	14	228	50	4	30	12.	24	180	33	45.	180.
3. Combined GNP 1967 (approx) $ m.	$360,000 m.	175,000	?	4,000	91,000	19,000	1,750	3,500	4,400	27,000	27,500	7,500 ~~17,000~~	19,000	23000
4. Date of inception	1957 (Treaty of Rome)	1959-60	1960 (Charter)	1960 (General Treaty)	1960 (Montevideo Treaty)	1966 (Declaration) 1969 (Treaty)	1968 [1st Comm. revised in 1973]	1967 [Earlier previous negotiations]	1959: Revised as CUDEAC 1964. Treaty	1959 UDEAO 1966 UDEAO 1968/9: WAEC	1964	1964	1957 (Agreement ratified) 1964/5	1967
5. Present situation	Expanded to 9 members	Semi-absorbed into EEC	Functioning	Honduras + Costa Rica have withdrawn but "normalisation" efforts	Virtually Frozen	Functioning	Functioning as expanded	Uncertain - Uganda/Tanzania conflict	Uncertain	Highly uncertain	Functioning	Frozen	Frozen	Embryonic
6. Regional Free Trade	Complete for "Six"	Complete for "Seven"	Limited - barter trade	Almost complete prior to 1971	Very limited - aim for 1980	Increasing - aim for 1980	Yes for 1973	Considerable but "tariffs tax" on some products.	Mainly exceptions	Many exceptions	Some partial agreements only	Very little	Limited. Originally aim for 1975	Not yet.
7. Common External Tariff	Complete + trade agreements with 3rd. nations	No.	No. (Controls)	Almost - some exceptions	No - aim for 1985 but abandoned.	Aim for 1975	No	Aim for but Considerable divergence	Aim for but Many exceptions	Aim for but many exceptions	No.	No	No	No.
8. Common Monetary Policy - Fiscal Policy	Possible — Limited V.A.T Harmonisation	No.	Small multilateral clearing — No.	Multilateral payments + mini-IMF. — Coordinated investment consensus.	No.	No — Coordinated investment consensus.	OL (but use Sterling) — Rudimentary institutional cooperation proposed	Common parity - no longer convertible on Common Central Bank. — Considerable (cinematic etc.)	Common Central Bank + common use of France. — Investment incentives and withdrawal taxes. Tax unique.	Common Central Bank + common use of France. — Aim for investment Fiscal progress Conseil d'Entente	No.	Some multilateral payments — No	No.	No.
9. Harmonised / Industry Project Cooperation — Services Joint — Development Unions	Limited - Coal + Steel. — Limited transport + power combination — Developed capital Markets European Investment Bank + regional funds.	No — Very Limited — No	Substantial — Railways, Post Telegraph, Nuclear Power coordinated. — International Bank for Cooperation	Integration Industries Sectors + Textiles — Research, Dvpt. Telecommunications Joint road + port studies — Central American Development Bank (CCABEI)	Complementation Agreements — Little — Loosely connected with Inter American Bank	Ambitious plans and (already) Petro-Chemical agreements — little — Andean Development Bank. (ADB)	No yet — University Research. — Caribbean Development Bank.	Lapsed — Railways, Ports Posts + telegraph Airways Research. Poor coordination — East African Development Bank (EADB)	Vetting "regional projects" — Postal administration — No	Small bilateral agreements — Harbour + Railways Senegal River Basin planning — No	Considerable progress — Airline + Shipping Co. planned. Road coordination — No.	Intended — Research and aim to coordinate industry + tourism — No (Planned)	No. — Limited — No (Think only partial subsidy)	Intended. — Intended. — Loose ties with Asian Development Bank
10. Joint Planning.	No.	No	In principle: Joint 1968-70 plans	Little.	No	Aim to consult. only	Aim to consult. only	Aim to consult only	Consultation only	No	No	Aim for Consultation only	No.	No.
11. Factor Mobility	Yes.	No.	Stress on technical exchange.	Little in practice	No	No	Hardly Limited	Recently restricted	In principle	Some restriction	No	No	In principle	No.
12. Agricultural Policy	Yes	No	No.	Agreement on basic grains	No — Limited trade in foodstuffs.	No	Small subsidy exports	Aim for: not in practice	Substantial free trade in foodstuffs.	No	No	No	Substantial free trade in foodstuffs	No.
13. Compensation for poorer members	Embryo regional policy	No	No	(i) CABEI operations (ii) Special concessions in investment agreement	Stress on "reciprocity" in trade	(i) ADB operating (ii) Concessions towards Intra-Andean agreement	Transfer taxes — Trade Liberalisation	(i) Transfer taxes (ii) EADB operations (iii) Planning of joint services	(i) Solidarity fund (ii) 'tax unique'	(i) solidarity fund (ii) restrictions on regional trade.	Balanced sector agreements	Not yet	No. (reciprocity in trade and (ii) bit purchase subsidies	No.

long as modern industry expands in underdeveloped areas the pressure will grow for increased economic integration".(1) The general relevance of these prescriptions can be seen from Diagram 2-1 which shows the number of very small and very poor "microstates" with under 5m. population and under $5 billion GDP (1966): this category now comprises a majority (increasing every year) of members of the UN. But of those countries that could be designated LDC's (about 70) only about 10 have internal markets of $5 billions which is equivalent to that of Norway or Greece. Even in the few larger countries the effective market size is further fragmented by internal boundaries such as high transport costs and uneven income distribution.

In Diagram 2-2. an attempt is made to set out in tabular form the main post-war attempts at economic integration. Inevitably the summary is highly abbreviated and fails to reflect the considerable complexity of the schemes. Three of these are for cross-reference purposes as the most successful experiments among 'advanced' industrial countries; the EEC,(2) EFTA,(3) and COMECON.(4) Of the others several have collapsed and most cannot be said

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(1) A. Scaparlanda: "The political economy of economic integration" in R. Hilton (ed.). "The movement Toward Latin American Unity." Op. cit. pp. 291-311.

(2) Data on EEC from: I. Walter: "The European Common Market", Praeger, New York 1967 Ch.2.
D. Swann: "The Economics of the Common Market", Penguin 1970.
G. Denton: (Ed.) "Economic Integration in Europe" Weidenfeld and Nicolson 1969.

(3) Data on EFTA from: "Building EFTA: a Free Trade Area in Europe": EFTA 1966.
H. Corbet and D. Robertson (Ed.). "Europe's Free Trade Area Experiment".

(4) M. Kaser: "Comecon: Integration Problems of Planned Economies" Oxford University Press 1967, and United Nations "Economic Integration and Industrial Specialisation among Member Countries of the Council for Mutual Economic Assistance": U.N. 66.II.13.4.

to be flourishing even in terms of their often limited frames of reference, and this includes the two which have lasted longest and achieved the greatest degree of harmonisation, the Central American Common Market and the East African Community. The former's problems are discussed elsewhere and the latter has just been reconstructed after virtual cessation in 1965/7.(1) A Caribbean Free Trade Area was founded in January, 1968, and appears to be flourishing though it is still in its formative stage: (2)(it had sufficient promise to attract Jamaica, the Leeward and Windwards in June 1968). The

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(1) Of the many contributions on East Africa, the following deal with the 1967 Treaty: (Treaty of East African Cooperation), Nairobi, Government Printer 1967 and its aftermath:
P. Robson: "Economic Integration in Africa" op. cit. pp. 154-165 and "The new setting for economic cooperation" in D. Rothchild (Ed.) "Politics of Integration" East African Publishing House 1968.
P. Ndegwa: "The Common Market & Development in East Africa", East African Institute for Economic and Social Research, 1968 CR.10 & 11
D. Mead: "Economic Cooperation in East Africa" Journal of Modern African Studies 1969.
At the time of writing the Community appears to be recovering from near disintegration due to conflict between Uganda and Tanzania on non-economic issues.

(2) Preliminary discussion of integration prospects in:
M. Brewster & C. Thomas: "The Dynamics of West Indian Economic Integration" University of the West Indies (Jamaica) 1967.
A. Segal: "The Politics of Caribbean Economic Integration": Institute of Caribbean Studies, Puerto Rica 1968 CR. 1 & 2.
N. Maritano: "A Latin American Economic Community" University of Notre Dame, Indiana 1970 [illegible]
A full Common Market was inaugurated in July 1973.

same can be said of the Andean Group, which emerged as a result of frustration with the slow progress of the Latin American Free Trade Area.(1)

The largest prospective integration group was the Latin American Free Trade Area. After a hopeful beginning following the 1960 Montivideo Treaty, the process of trade liberalisation in LAFTA slowed down and there was a failure to agree on the second major round of multilateral tariff cuts on the "common list" in 1967.(2) There was also failure to proceed far by national bilateral negotiation after 1962, and relatively little sectoral integration as planned. The Punta Del Este Declaration in 1967 failed to provide more than a declaratory stimulus to further integration, aiming for a Common Market by 1985,(3) and under the 1969 Caracas Protocal reduces

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(1) This group was formally established in 1969 after preliminary discussions in 1966. At the time of writing agreement had just been reached on a common policy towards foreign investors following upon agreed programme for a development bank trade libéralisation, and joint planning of the chemicals industry (with metals, machinery and new cars): see "The Andean Group: a promising start" Bank of London and South American Review, Feb. 1971.
F. Vicuna: "The dynamics of subregional agreements within the LAFTA movement" in R. Milton (Ed.) "The Movement Towards Latin American Unity" op. cit.
E. Milenky: "From Integration to development nationalism: the Andean Group 1965-71" Journal of Inter-American Affairs 1972.

(2) United Nations (E.C.L.A.) "Multilateral Economic Cooperation in Latin America" Vol. No.1 "Texts and Documents" (U.N. 62.II.S3).
J. Navarette: "Latin American economic integration a survey of recent literature" Journal of Common Market Studies, Dec. 1965 pp.158-177.
V. Urquidi: "Free Trade and Economic Integration in Latin America", University of California Press 1962.
United Nations (E.C.L.A.) "The Latin American Common Market", Mexico 1959.
S. Dell: "A Latin American Common Market?" Oxford University Press, 1966.
M. Wionczek (Ed.) "Latin American Economic Integration Experiences & Prospects" Praeger 1966.

(3) Based largely on the recommendation of R. Prebisch, F. Herrara, J. Mayobre and C. de Santamaria as in "Proposals for the creation of a Latin American Common Market" Journal of Common Market Studies, Sept. 1966.

the pace of liberalisation: the target for complete free trade was put back from 1973 to 1980.(1) The two main participants in LAFTA trade, Brazil and Argentina have recently (in 1968) formed their own 'subregional' group involving Bolivia, Uraguay and Paraguay ("la Cuenca del Plata") which is so far directed at selected joint projects; a river fleet, a port terminal, a regional lumber project, iron and steel development and a development finance corporation.

Asia, the Arab World and West Africa have been conspicuously less successful in producing viable integration schemes than elsewhere. S.E. Asia has been subjected to destabilising military conflict, and political uncertainty has prevailed in Burma, Indonesia and elsewhere: in this area there is so far only a highly tentative grouping, A.S.E.A.N. and this lacks a full treaty.(2) The Federation of Malaysia (signed 1963) incorporated a Common Market, but proposals were never adapted for implementation(3) and the whole idea died with the Federation in 1965. India is sufficiently large to feel little need for integration, and its trade with Pakistan is limited for political reasons. The only successful project so far has been in West Asia

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(1) The present day Latin America situation is described and analysed in:
R. Hilton (Ed.). "The Movement Towards Latin American Unity" op. cit. (Introduction).
M. Wionczek: "Rise and decline of Latin America integration": Journal of Common Market Studies, 1970. Vol.IX no.1.
E. Gale: "Lafta progress, problems and prospects" Washington 1969.*
W. Krause & J.F. Mathis: "Latin America and Economic Integration: Regional Planning for Development" : Iowa City, University of Iowa Press, 1970.
*extract in P. Robson (Ed.) "International Economic Integration" Penguin 1972.

(2) O.E.C.D.: "Economic Cooperation in Asia" Paris 1970.

(3) I.B.R.D. (World Bank) Report on the Economic Aspects of Malaysia 1963.

between Turkey, Iran and Pakistan (the R.C.D. group) and these countries are largely concerned with coordinating (specific industrial) investments, rather than free trade.(1)

The Arab world east of Tunisia has been working towards closer economic integration since the early 1950's and some progress has been made in tariff reduction through the 1963 "Arab Economic Unity" which deepened into specific agreement in 1965 aiming for a Common Market in 1975.(2) However, progress so far has been hampered in trading and coordinating manufactured products despite relatively free trade in agricultural and mineral products, small tariff cuts on most manufactures, and partial elimination of quantity restrictions. Kahnert observed of the Common Market that "its achievements in virtually every field have been extremely meagre; moreover neither the institutional framework established to supervise the execution of the agreement nore the progress made in the formulation of concrete plans give much hope for an early realisation of the agreements objectives".(3) The Mahgrab Group ("Permanent Consultative Committee of the Mahgrab countries") set up provisionally in 1964 has so far been largely concerned with investigation ways of coordinating industrial development without necessarily embarking upon regional free trade,(4) has launched a development bank. Libyan political eccentricit[illegible] arrested its growth; but have fostered another Arab grouping with Syria, Egypt and Sudan.

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(1) Nurul Islam: "Regional Cooperation for Development: Pakistan, Iran & Turkey" Journal of Common Market Studies, March 1967 pp.283-302.

(2) A.G. Musrey: "A Study in Inter-Arab Trade Relations 1920-67" Praeger 1970 and "First Steps towards Arab economic unity" International Development Review No.1, 1971.
Diab Muhammed: "The Arab Common Market", Journal of Common Market Studies; May 1966, pp.238-250.

(3) F. Kahnert, et. al "Economic Integration amongst Developing Countries" op. cit. p.52.

(4) The prospects of the "Mahgrab Group" are discussed in B. Muthaika: "Towards Multinational Economic Cooperation in Africa" Praeger, 1972 pp.294-299.

Finally, West Africa has suffered from several failures of political federation (Guinea/Ghana; Mali/senegal) and of economic integration. However, schemes are still being actively canvassed and tried.(1) Arising from the French colonial practice there were customs unions in both 'equational' and 'west' Africa. The former provided the basis for the Central African Customs and Economic Union (UDEAC),(2) which appear to have disintegrated, two years after its formation in 1966,(3) but still exists on paper. The latter formed the basis of the West African Economic and Customs Union, (UDEAO) which "has virtually ceased to exist" despite re-negotiation in 1966."(4) It is now hoped that it will be subsumed in a larger Economic Community which includes English speaking states and Guinea, and Liberia too: and a group including Gambia and Ghana was considered in 1968. However, such a group has yet to become effectively operational and has the probably insuperably divisive problem of separate monetary systems notably the franc area, which is grouped into a West African Monetary Union (UMAO) with a Common Central bank,(5) the sterling area (Gambia, Sierra Leone and Nigeria) and the dollar 'enclave' of Liberia: the limited agreements reached so far on tariffs have been

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(1) B. Muthaika ibid. pp.286-294. He estimates that there are about fourteen overlapping groups in the region. Adebeyo Adedeji "Prospects for regional economic cooperation in West Africa" Journal of Modern African Studies 1970.

(2) A. Hazelwood (Ed.) "African Integration and Disintegration" 1969 (Ch.2 by Robson): P. Robson "Economic Integration in Africa" op. cit. ch.5.

(3) The Central African Republic and (Chad.) left in 1968. Then these two countries with Congo (Kinshasa) then formed a Central African Economic Union (UEAC) excluding Gabon, Cameroon, and Congo (Brazzaville). Also the U.N. Agency E.C.A. is trying to promote the idea of a larger grouping involving Congo Kinshasa, which sent observers to UDEAC. As far as can be, seen however, UDEAC (now minus only Chad) is still the basis of economic integration in the area. Africa Research Digest, 1971.

(4) Quote from F. Kahnert, et. al., op. cit. p.52. The background is described in P. Robson "Economic Integration in Africa" op. cit. pp.244-248. The group was subsequently reconstituted into a West African Economic Community (1971). (African Research Digest and Mutharika, Ibid)

(5) Despite their other problems the [illegible] West African and Equatorial African areas maintain substantial monetary integration.

between UDEAO countries. There have been various cross-cutting proposals often aimed at breaking down linguistic barriers; the proposal of "Senegambia";[1] a proposed customs union between Ghana and Upper Volta (1961); a free trade area between Guinea, Ivory Coast, Liberia and Sierra Leone. Failure of more grandiose schemes has led to modest arrangements like the Conseil de l'Entente to develop projects jointly within the UDEAO umbrella - involving Dahomey, Volta, Togo, Niger and Ivory Coast.[2] There has been discussion of a West African Iron and Steel community, which would fit within the Economic Community[3] and there have been agreements on industrial projects (Togo and Dahomey), and for multi-purpose development of the Senegal River and Lake Chad.[4] In Africa, generally there is a bewildering array of bilateral trade agreements and limited agreements.

There are many other past or present or potential schemes that have been ignored. For example no mention is made of free trade area, common markets and economic unions of colonial vintage, which have not survived independence

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(1) P. Robson ibid. pp. 280-285; A. Hazelwood (op. cit.) African Integration and Disintegration" pp. 115-128. There have been joint projects arising from this proposal.

(2) Mentioned in B. Muthaŝika op. cit. p.288; United Nations "TradeExpansion and Economic Integration etc." op. cit. Ch.3 and United Nations: "Industrial Development Survey: Volume II" UNIDO New York Ch.5. This is a flourishing group which ... developed a mutual investment guarantee fund; and is planning joint industrial projects for cement, tyres and petrol.

(3) Inter-American Development Bank: "Multinational Investment in the Economic Development and Integration of Latin America" Colombia 1968; paper on "Iron and Steel in West Africa" by Bax Nomvete pp.281-303.

(4) The Organisation of Senegal River States (Guinea, Mali, Mauretania and Senegal, has been developed into an active little group, coordinating agriculture and telecommunications, and providing the basis of a plan for industrial coordination (paper to Guinea; Iron and Steel to Mali and Mauretania, petro chemicals to Guinea).

such as the Rwanda-Burundi Economic Customs Union, the Malaysian Federation and the Central African Federation.(1) After restructuring arrangements, East Africa, the West Indies, possibly UDEAC and UDEAO have survived in a modified form.(2) Secondly there are cases of multinational cooperation on trade policy such as OCAM, the French-speaking African countries' common market in sugar, and even amorphous groups such as the "Group of 77" within UNCTAD. Thirdly, no mention has been made of "preference arrangements" between metropolitan and former or presently subject nations which have had a significant effect on trade flows, such as Commonwealth preference, Portuguese relations with its overseas territories and the connection between the former French Union and France, now incorporated in the framework of E.E.C.(3) Fourth there are some cases where political federation has occurred and this has involved economic union.(4) Fifthly, there are many ideas currently being canvassed which may or may not come to fruition: proposals for New Zealand/Australian integration,(5) for free trade between Canada and the U.S.,(6) for P.A.F.T.A.,(7) N.A.F.T.A.,(8)

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(1) The Central African Federation, now defunct had important experience in respect of its attempts to balance gains and losses; A. Hazelwood "African Integration and Disintegration" op. cit. Ch.6.

(2) One should also mention a group which is still surviving, the South African Customs and Monetary Union (South Africa and three former protectorates), which was recreated in 1969 and has a common market, monetary integration, substantial joint services and a revenue sharing agreement.

(3) The importance of these 'preferential' connections is brought out strongly in H. Linnemann: "Econometric Analysis of Trade Flows" North-Holland 1966. Also P. Kenen and R. Lawrence (Ed.) "The Open Economy"; article by R. Lawrence "Primary Products, Preferences & Economic Welfare: the EEC and Africa" pp.240-260.

(4) Somalia and Cameroon (discussed in A. Hazelwood ibid.).

(5) P. Elkan: "Blueprint for an area of quantitatively and structurally balanced free trade": Journal of Development Studies. Sept. 1966 pp.1-13.

(6) R. Wonnacott and P. Wonnacott: "Free Trade between Canada and the U.S." Harvard 1967.

(7) PAFTA = Pacific Asia Free Trade Area. Viyoshi Kojima: "A Pacific Economic Community and Asian less Developed Countries": Hitotsubashi Journal of Economics June, 1966 pp.17-37, also "Japanese interest in Pacific Trade Expansion: PAFTA reconsidered": June 1968 pp.1-32. Criticised in H. Arndt: "PAFTA: an Australian assessment". Inter-economics 1967 pp.271-6.

(8) NAFTA = North Atlantic Free Trade Area: "A Free Trade Option: Opportunity for Britain" Maxwell Stamp Associates, 1967.
R. Cooper and H. Johnson in B. Balassa and M. Kreinin "Studies in Trade Liberalisation" op. cit. Ch.II esp.

ASPAC,[1] and Nordek[2], and a host of other concoctions.

These various attempts at economic integration have been classified together above, but they include agreements concluded on the basis of entirely different philosophies. If one were to categorise them then the following basic distinctions should be made:

(a) on one hand those groupings that are largely concerned with making a move towards freer trade and to maximise the trade "creation" factor in the Union and minimising trade "diversion": EFTA, NAFTA, PAFTA, and (oddly) CARIFTA, appear to have this end in view. The other arrangements are with varying degress of thoroughness trying to use the regional market as a means of minimising the cost of protection based on the external tariff and import substitution, if necessary by encouraging "trade diversion": with the RCD, COMECON and LAFTA this goal is fairly explicit. This distinction would broadly correspond to one between industrialised and industrialising countries based upon the differences in the theoretical rationale for integration in the different circumstances.

(b) One can also distinguish a "liberalist" rather than a "dirigiste" approach.[3] The former sees the gains from unions coming largely from unrestricted competition induced by freer trade with authorities at a multinational level intervening to stop distortions in competition developing (EEC, EFTA). The latter is largely concerned with using the role of an interstate executive to ensure planned specialisation. At its highest level as in COMECON one has something approaching a 'multinational plan' and in most integration agreements there is some attempt to indulge in sectoral or project industrial coordination of some kind (as in the CACM Integration Industries Scheme, the R.C.D., the LAFTA/Complementary and "Andean" Agreements, or the East African "Kampala Agreement"). However, in practice many of these schemes have a high

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(1) ASPAC = Asian and Pacific group : of Australia; New Zealand, Japan, Korea, Laos, Malaysia, Phillipines, Thailand and S. Vietnam.

(2) Nordek is a proposed Scandinavian Customs Union which was envisaged if negotiations to join the EEC failed for Norway and Denmark. It is unlikely to materialise.

(3) The distinction is made in Balassa "Economic Theory and Economic Integration" op. cit. pp. 7-10.

"liberalist" content regardless of its seeming irrelevance to the underlying rationale for integration in developing countries, while "liberalist" groups like the EEC may have a substantial degree of 'planning'.

In fact these distinctions are far from perfect and there are considerable internal contradictions in both the Treaties and operational arrangements.

CENTRAL AMERICAN INTEGRATION.

The first major step forward in the post-war period[1] was in 1951 when the five governments agreed after a meeting under the auspices of the UN Economic Committee for Latin America to promote the "gradual and progressive integration of their countries national economies".[2] A committee of economic cooperation was set up which explored "the interest of the governments in developing agricultural production and industry and systems of transport in a way that promotes the integration of their economies, the formation of larger markets facilitating trade, coordination of development plans and the creation

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(1) There had been a large number of attempts to integrate the region ever since the failure of federation in 1839, following independence in 1821. It has been estimated that twenty five official attempts were made. None succeeded as their links were with Spain rather than each other and overland transport was very poor, these economic factors proving stronger than the cultural bonds of religion, language and tradition. The large scale development of a plantation economy based on the export of coffee and bananas to the world market was a further factor causing an aligment of modes of communication on an extra-regional rather than inter-regional basis. Even in this later period attempts were made to integrate in 1896/8 ("Republica Major"), 1910 (the Washington Treaties) and 1921. Sources: T.L. Kanes "The Failure of Union: Central America 1924-1960" Chapelhill 1961.
F.D. Parker: "The Central American Republics" 1964.
B. Solnick: "A historian's view of Central America: economic integration and political unity" in R. Hilton (Ed.) Ch.37, "The Movement Towards Latin American Unity".

(2) Resolution 9. Report of the Economic Commission for Latin America; Fourth Session: United Nations Economic and Social Committee, New York, 1951 (E/EC 12/275).

of companies in which all have an interest".(1) Subsequently, there were three phases.(2)

(i) the formation period to 1958 when the basic problems were discussed and studied mainly under the influence of the Economic Cooperation Committee.(3) Several influential studies were carried out and bilateral agreement reached.

(ii) the second was the organisation period from 1958-60 when the main treaties were signed under ECLA guidance.(4) The 1958 Multilateral Treaty established free trade for some products (239 tariff groups) and aimed for a free trade area in ten years. The Treaty also aimed for harmonisation of industrialisation incentives (Article V), and equalisation of the external tariff (Article IV). Concurrently was signed the agreement on "Integration Industries" concerned with regulations for building large industrial units based on the regional market.

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(1) United Nations (E.C.L.A.) "Informe de la Primera Reunion del Comite de Cooperacion Economico del Islmo Centroamericano", Honduras Aug. 1952,

(2) This classification is used by J. Pincus: "The Central American Common Market" 1963 USAID (Guatemala).
and A. Wardlaw: "The Operations of the Central American Common Market", USAID, 1965 p.6.

(3) United Nations (E.C.L.A.) "The Central American integration programme: evaluation and prospects" Economic Bulletin for Latin America, Oct. 1959 and "Documentacio... ... Comite de Cooperacion Economica de Istmo Centroamericano" Mexico 1965.

(4) The texts are in United Nations "Convenios Centro-americanos de integracion economica" (ECN 12/CCE/315) 1964 or United States Aid "Economic Integration Treaties of Central America" Guatemala 1964.

Also in this formative period was signed (1959) an agreement to equalise the external tariff within five years of the effective date of signature, and introduce a uniform tariff classification (NAUCA). In order to speed up the integration process a Treaty of Economic Association was signed between Guatemala, Salvador and Honduras in 1960.(1) This was superceded by a General Treaty of Economic Integration, signed in 1960, taking precedance over previous agreements and laying the framework for the Common Market, and to which all the five countries had adhered by 1963. The General Treaty aimed to create a free trade zone (after 5 years) and a full customs union.

(iii) the third phase was concerned with implementation of the Treaties and the many subsidiary features of the arrangement such as setting up an Integration Bank and a Clearing House for currencies, as will be discussed below.(2)

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(1) Motives were complex: see J. Nye "Central American Regional Integration": International Conciliation No. 562 March 1967.

(2) The process of implementation is described and evaluated in many texts, inter alia; J. Cochrane: "The Politics of Regional Integration : The Central American Case" Tulane University, New Orleans 1969 Ch. 3.
I. Walter and W. Vitzhum: "The Central American Common Market": The Bulletin of New York University. (Graduate Business School No. 44).
United Nations (E.C.L.A.) "Evaluacion de la Integracion Economic en Centroamerica" 66 [illegible] and "General situation and future outlook of the Central American Integration": Economic Bulletin for Latin America 1963 [illegible]
and "Documentacion del Comite de Cooperacion Economica del Islmo Centroamericano" CEPAL/MEX65/5 1965.
SIECA: "Cinco Anos de Labores" Guatemala 1966.
G. Lava: "Incidencia de la integracion en la economica Centroamericana" Economica Salvadorena 1965 pp. 17-27.
S. Nogiera: Morales: "Evaluation de los resultadoes obtenidos con la integracion economica centroamericana" Economia No. 5 University of San Carlos, Guatemala, 1963 pp. 16-33.
C. Staley, "Central American economic integration" : Southern Economic Journal Oct. 1962.
J. Crow: "Economic integration in Central America" Finance and Development March 1966.

Many writers have considered the institutions of the Market [1] to be more important than the Treaties.[2] There are so many escape clauses and open ended commitments that the real success of the arrangement has been to resolve the endless minor disputes that have arisen and to maintain until 1971 the involvement of the partner states. For example it has been necessary for every Treaty or protocol to a treaty to be ratified by the governments individually before it is effective for that government and in some cases ratifications have been delayed for many years (in fact, to 1969 for most agreements). The burden of day to day management and of sustaining interest falls on three bodies:

(i) the Economic Council, consisting of the five Economic ministers - the top policy making body,

(ii) the Executive Council consisting of the five permanent officials, who interpret and implement the treaty,

(iii) SIECA, the Secretariat, and arguably the main force behind the Market.

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(1) Described in detail in F. Villegran-Kramer: "Integration Economica Centroamericana" Universidad de San Carlos de Guatemala; Guatemala 1967.
D. Sidkanski: "Dimensiones Institutionales de la Integracion Latino Americano" INTAL, Buenos Aires 1967.

(2) This argument is suggested inter alia in; "Business International Corporation. "The Central American Common Market: Profits and Problems in an Integrating Economy". 1967 op. cit.
P. Schmitter "Central American Integration: Spillover, Spillaround, Encapsulation" Journal of Common Market Studies, Sept. 1970. p.5. He argued also that the General Treaty is not simply a once and for all agreement to eliminate barriers on mutual trade ....." but rather on ingeniously contrived set of continuous obligations".

Since the rapid establishment of the Common Market in the early sixties, serious internal crises developed round about 1968 when a "summit" was held in San Salvador.(1) However in 1969 Nicaragua withdrew after disputes over a collective approach to the regional balance of payments problem, and shortly afterwards rejoined. Shortly after that the "war" broke out and there has been a continuous disruption of operations since then. In order to establish a pattern for future development a 'Modus Operandi' was discussed in 1970,(2) though this failed to prevent Honduras issuing Decree 97 in the same year, reimposing tariffs on Central American trade and thereby effectively leaving the CACM. Costa Rica followed. Efforts are currently being expended to resume the CACM through a "Normalisation Commission".

The Main Elements in An Integration Process.
I Trade Liberalisation.

As argued in Chapter 1 trade liberalisation is a means to an end rather than an end in itself, but it is also a necessary condition for close integration whether it takes place on a 'planned' and sectoral basis or unilaterally and "across the board". The Central American programme will first be described(3) and then put in a broader setting.

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(1) Results of this "summit" are recorded in S.I.E.C.A. "Acta del Tercer Period de Sessiones de la Tercer Reunion de Ministeros de Economia de Centroamerica" Guatemala 1968, and also S.I.E.C.A. Carta Informativa No. 81. The summit agreed to (i) a stabilisating fund for intraregional payments problems.
(ii) better coordination of agriculture and industry; (iii) an improved regional capital market; (iv) greater labour mobility; (v) a regional telecommunications and electricity policy; (vi) to strengthen CABEI (the regional bank); (vii) more funds for ICAITI (the regional research institute).

(2) The terms of the 'modus operandi" are described in S.I.E.C.A. "Acuerdos de los Ministerios de Economica para el establacimiento de un 'modus operandi' del Mercado Comun Centroamericano",S.I.E.C.A./R.M.E.G.-M-3/D.T.4/Rev.2 Sept. 1970. They agreed to (i) a special fund within CABI directed mainly to helping the poorer parties; (ii) the need for a clear planned industrial policy; (iii) the need for an overhaul of the external tariff and definitions of "origin" and to redefine elegibility for fiscal incentives to prevent abuse; (iv) the need for a regional agricultural policy - urgent action on storage and price regulation; (v) the tolerate emergency balance of payments measures, if necessary, against deficits on regional trade.

(3) The free trade provisions of the Treaties are discussed in S.I.E.C.A. "Cinco Anos de Labores en la integracion economica centro-americana". Guatemala City, 1966, and S.I.E.C.A. "Informe sobre los avances del programme de Integracion economica Centroamericana. SIECA/69/S.G./52. Guatemala 1969.

The 1958 Multilateral treaty envisaged immediate free trade in 200 items followed by periodic product by product multilateral negotiations leading, after ten years, to free trade in most products. This approach was very cautious, especially as many of the agreed items were not locally produced and others were already the subject of bilateral agreements.(1) Frustration led to the 1960 Tripartite Treaty which was more fundemantal in approach and aimed for "across the board" free trade except for 50 commodities to be dealt with in a 10-15 year transition. This quickly led on to the General Treaty which extended this bold approach to the four (later five) countries. Immediate free trade was designated for all except a few products, mainly about 50 "temporary exceptions" which could create special problems of disruption of production or revenue collection. Many of these exceptions disappeared after a five year transition in 1966, but two categories remained: first, there were 23 products such as sugar, coffee and cotton and alcoholic beverages excluded from free trade, some because of the conditions of international commodity agreements. Secondly, there are a few others (such as petroleum and some consumer durables) which are temporarily excepted pending agreement, though some of these, like glass bottles, beans, rice and maize, have been recently settled. In addition, the General Treaty prohibited dumping in intraregional trade, and agreed to eliminate the "protective" effect of internal taxes.

It should not be assumed from this that trade is without impediment. First there is no provision for free trade in transit trade - re-exporting. Second there is a good deal of checking at each border and on low unit value product the cost of loading, unloading and waiting can be equivalent to a substantial tariff.(2) There have also been conflicts over origin, labelling etc. which lead to delays and disputes.(3)

(1) United Nations: "Central American Integration Programme, Evaluation and Prospects" op. cit.

(2) Klaus Huber: "Central American Road Pricing Study" World Bank 1970. (Unpublished).

(3) S.I.E.C.A.: "Problems del Mercado Comun" (Seventh Reunion of the Economic Council) S.I.E.C.A./CEC-7-0/DT3 Guatemala 1967.

In its sweeping elimination of obstacles to free trade by automatic and linear liberalisation, the Central American group has at least until the disruption in 1969, a good performance. Amongst developing countries only CARIFTA has been comparably radical in approach aiming for free trade over the 1968-71 period for most products with 50% local value added, but allowing quota restrictions if one partner has balance of payments difficulties (which were rejected by the CACM).

Part of the reason why Central America has advanced so easily to free trade is that tariff reduction is politically more difficult if there are strong vested interests in existing protected industry (both in ownership of capital and on the labour side if there is substantial employment). It is usually much easier to negotiate concessions for products which might be produced in the future. With such a small industrial base there have been limited foci of resistance. Vested interest of existing producers have been partly protected by the five year transition, in a few cases by exemption, but mostly have been ignored.

In LAFTA this was less easy and an approach was adopted in the 1960 Montevideo Treaty similar to that in the 1958 Multilateral Treaty. Tariff reduction in LAFTA proceeds by two mechanisms: first, individual countries enter into annual negotiations to place products voluntarily and only semi-permanently on a "national list"; second there is a "common list" of permanently agreed reductions which are negotiated triannually with the original intention of achieving free trade 12 years after initiation i.e., 1972. It was mainly the "common list" negotiations which caused ECLA to founder when the second stage was not agreed in 1967, but even in the 'voluntary' national list negotiations where there are more escape clauses and concessions are not irrevocable, progress was strictly limited often on non-produced items, largely between Argentina and Brazil and for agricultural items (75% of trade in the

1960's). Planned annual reductions have now been reduced from 8% to 3%: the 1969 Caracas protocol envisages a free trade area only by 1980 at which time it is hoped to integrate CACM to the group too.(1) Just as LAFTA ran out of steam by its 'step to step' approach and by its willingness to make exemptions in all cases where tariffs were of importance to the domestic economy, the Arab Common Market had identical problems, and negotiations failed at the 3rd and 4th stages of tariff negotiations by which time much agricultural and 'non-produced' industrial items were freed with escape clauses but tariffs on manufactures were cut by less than half.

An entirely different approach has been adopted by two of the African Common Markets, which inherited a free trade situation very largely, in trying to deal with the problems which unrestricted free trade had had for established industry. The East African Community allows the deficit countries (Uganda and Tanzania), to impose "infant industry" tariffs (called "transfer taxes") of up to 50% of the external tariff and for up to eight years on any intra-regionally trades good on which a deficit country on regional trade is producing. In the West African Community (UDEAO) it was agreed that tariffs at 50% of the external tariff should be allowed on intra-regional trade and 70% where products were competing. In these cases the arrangement is more of a preference arrangement than a customs union and as such appears to conflict with GATT requirements,(2) though the advantage in terms of preventing serious dislocation, are considerable. UDEAO permitted quantity restrictions in regional trade; but not East Africa. In the other groups

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(1) The Andean group has a similar target - for free trade, largely by 1980 and completely by 1985: excluding important agricultural products.

(2) Under the terms of acticle XXIV, participants may derogate the unconditional "Most favoured nation" clause only if they establish a customs union or free trade area. Any other form of preference is illegal unless existing previously. However, it is believed that greater flexibility has now been introduced into GATT. pp.90-91.
United Nations "Trade Expansion and Economic Integration" 67IID20.
In Central America, only Nicaragua is a member of GATT.

little progress towards generalised free trade has been made.(1) Thus as far as regional free-trade is concerned, the CACM has gone further and faster than any group outside of the EEC/EFTA groups.

II. Common External Tariff.

The need for harmonisation of the external tariff derives from several factors. First, if there are differences in rates of duty on imputs of raw materials and capital goods then this could distort cost differences. Second there is worry over 'deflection', with goods entering a region through a low-duty partner country and being re-exported duty free to a high-duty country to avoid duty: though this can be dealt with by not allowing free trade in re-exports (as in Central America) or having clear rules of origin (EFTA and CARIFTA). Third and most important in this context, a low duty in one national market may weaken the advantages of scale and of market certainty, especially when transport costs between producers and peripheral consumers are already large. This aspect is crucial in Central America as the external tariff is perhaps the most important element in industrial promotion.

The common tariff was adopted in the 1959 Agreement on Tariff Equalisation and in subsequent protocols (1959,60,62,64,65).(2) There were relatively few problems as the countries had similar industrial structures and relatively little divergences in industries dependent on substantial protection;

(1) There is considerable free trade in UDEAC, but this is limited by quotas and discriminatory taxes especially between Cameroon and the rest, and all "regional" industries have to be collectively approved before being allowed free trade. The Magreb scheme has made little progress in trade liberalisation. The South African Customs Union involves free trade but with a small volume of goods.

(2) Technically, it is not a common tariff in as much as revenue is collected nationally not by a joint body: also allowed until recently were nationally permitted duty drawbacks.

as there were relatively few monetary and exchange controls, or quantity controls, to complicate the negotiations (as in LAFTA) and no cross-cutting preference agreements (as in West Africa). 85% of items were equalised immediately and most of the others over a five year transition. Exceptions now make up only 2% of the items in the tariff schedule, but these contribute 17% of the total Central American imports (1968) (1) and 8% of the tariff revenue. The Treaties also reorganised the customs classification to a common code.

The tariff negotiations resulted in a significant increase in the average tariff from 65% on consumer goods to 82·5%; 30% to 34·4% for intermediate goods and raw materials; 20% to 32·2% on building materials and 12% to 13% on capital goods.(2) The increases were largest for Honduras. Also the governments have taken the crucial step of agreeing to submit all tariff increases to approval by the Common Market, thus ensuring that the Common Market C.E.T. is adequately policed, though the procedure agreed is that every tariff change has to be separately approved by protocol by all the partner states; which is cumbersome. The next step is a major revision of C.E.T. carried out jointly by S.I.E.C.A. and the Normalisation Commission.

Despite its many exceptions, the Central America, C.E.T. is more consolidated than that of most other schemes. In some, like the Arab Common Market (and COMECON) it is meaningless to talk about 'a common tariff' as protection operates through quantity controls and the preferential buying of state importing organisations. The problems presented by the tangle of monetary controls and exchange rate distortions were so great that the LAFTA

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(1) Details in "Central America: the process of integration". Bank of London and South America Review. June 1968. The 17% is accounted for by, 7% cars; 4·5% petroleum products; 2% wheat, plus refrigerators, jute sacks and others.

(2) I. Walter and W. Vitzthum op. cit. p.34. As will be shown in Ch.3, these average tariffs are largely meaningless measures of the level of protection.

Montivideo Treaty did not envisage a common external tariff for LAFTA, except in Complementarity Agreements, and the Punta de Este declarations did little more than envisage 'a common market' of all Latin America in 1985. The Andean Group are aiming for 1980. The East African Community does have a common external tariff.(1) UDEAC has one in principle; though there are exceptions.(2) The West African Community in the form of UDEAC is committed a common tariff in principle ("droit de duane") though any tendency to draw together English and French speaking areas will make this impossible in the short run, and little had been achieved in the French-speaking area; much less than in UDEAC.

Taking free trade and common external tariff provisions together Central America emerges as the "purest" case of a customs union (in an economic sense) amongst developing countries, U.D.E.A.C. and East Africa are advanced too but they spring from colonial customs unions, and this makes the Central American achievement seem all the greater.

III. Harmonised Balance of Payments and Monetary Policy.

The main relevance of monetary integration is due to the fact that the process of trade liberalisation, unless done on a narrowly reciprocal basis is likely to create surpluses and deficits on regional trade which presents some partners with a "payments" problem especially if substantial trade diversion is involved. If currencies are completely convertible as in the EEC then the problem merges into the general balance of payments problem. On the other extreme, if there is a common currency, then there is no "regional" balance of payments problem by definition. Problems arise for non-convertible overvalued separate currencies when either one partner accumulates surplus

(1) However, it is being eroded as countries are allowed to fix the tariff unilaterally. P. Robson "Economic Integration in Africa" op. cit. p.108.

(2) ibid. p.188-190. There are, however, many "supplementary taxes" allowed on imports which enable differences to persist; also there is a 'two-column' tariff for different countries of origin in view of Britain's position viz a viz West Cameroon.

non-convertible currency which it cannot use or when a partner is obliged to settle regional debits in "scarce" convertible currency. A second though in some ways related major problem area is that if individual countries attempt to settle their overall balance of payments unilaterally by exchange rate charges, export subsidies or tariffs then this either conflicts directly with Market rules or else affects money costs and cost advantage within the areas as well as the confidence of investors and member countries. Thus it is very desirable from the point of view of long term investment decisions and trade realignment that there should be stable exchange rates and freedom from controls. A nation going into an integration scheme with an overvalued exchange rate may suffer from a short fall of exports in the new market and immediately subject its balance of payments to even greater strain.(1) Thirdly, substantial trade in new markets requires financing and a good deal of technical cooperation amongst banks and Central Banks.

Coordination in Central America was not initially directly concerned with the first two basic problems.(2)

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(1) The whole principle of monetary integration as a necessary or desirable concommitant of regional economic integration is discussed in J. Vanek: "Payments unions among the less developed countries and their economic integration", Journal of Common Market Studies, 1966 pp.187-191: F. Keesing and P. Brand:"The possibilities among the less developed countries and their economic integration". IMF Staff Papers 1963 pp.187-191 and "Las Union es de pagos entre paises de menor des arollo, eficax instrumento de integracion economic". El Trimestre Economico 1865. pp.524-529.
J.V. Mladek: "Currency Unions - Pro & Con" Finance and Development 1966.
P. Robson "Economic Integration in Africa" op. cit. pp.49-54.
B. Balassa: "The Theory of Economic Integration" op. cit. pp.257-274.

(2) The history and debate about Central American monetary integration is covered in:
J.P. Young: "Central American Monetary Union" USAID, 1965.
de Valle: "Problemas de Integracion Monetaro Centroamericano": "Enonomia" University of El Salvador, 1964. "Monetary integration in Central America: achievements and expectations". Journal of Common Market Studies, 1966. pp. 13-25. "Intra-Central American payments system and trade" in M. Wionczek. "Latin America Economic Integration", op. cit. 1966.
J. Molina Calderson: "El peso centroamericano: situacion y perspectivas" in Universidad de San Carlos LXXI op. cit. pp.29-65.

This was partly due to the fact that the area has had remarkable price and exchange rate stability and policies generally have been geared to maintaining those goals, (1) governed by the priority of protecting agricultural export prices and preventing an expanding money supply leading to a sudden influx of imports and a deterioration in the balance of payments. As a consequence of this, Honduras and Nicaragua now have convertible currencies without direct restrictions on exchange. (2) Those in Guatemala and El Salvador involve some licensing of foreign exchange transactions. Costa Rica had a complex system of multiple exchange rates, and has more comprehensive controls and historically, less of a commitment to price and exchange stability and convertability. (3) However monetary coordination is still of importance because external balance of payments difficulties exacerbated by a serious imbalance on intra-regional trade could lead (and has led) to a demand for controls and revaluation affecting regional trade.

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(1) The Central American currencies are amongst the "hardest" in the world. The Honduran lempira (= ½ US dollar) is unchanged in parity since 1924; the Salvadorian colone (= •4 US dollars) is unchanged since the war; the Guatemalan quetzal (= one dollar) has never been devalued against the US dollar; the Nicaraguan codoba was fixed at 7 to the dollar in 1948/49.
There is also very little inflation. Over the 1960-69 period the cost of living index rose in total in Guatemala by 4%; Salvador by 8%; Honduras by 21%; Nicaragua by 6% and Costa Rica by 20% (IMF International Financial Statistics).

(2) See also M. Gomez Valencia "Inflacion y integracion". Universidad de San Carlo LXXI op. cit. pp. 67-73. There have been indirect restrictions e.g. on the extension of bank credit for imports.

(3) At its accession to the common market Costa Rica has three rates of exchange (following a devaluation in 1959); an "official" rate of 6•62 to 6•65 colones to the $; a "free rate" of . colones to the $ used for non-essential, non Central American imports; and a bank note market offering 4-5% above the official rate. In 1969 the exchange rate was unified at 6•65 and the currency was made fully convertible. In the 1971 dollar devaluation crisis the colon was devalued against the dollar (to 8•6 colones in August and 7•9 in November) while the other C.A. countries remained pegged.

Following a long standing recognition of the need for monetary cooperation the first tangible step was the creation of a clearing house arrangement(1) in 1961, in order to facilitate payments in national currencies. This clearing house allows central Banks to run up credits of up to $1/2m. in their own currency with convertability guaranteed with a full settlement every six months.(2) This had the advantage of making regional transactions easier and economising on the value of reserves required to finance a given volume of trade. As a result, the proportion of trade settled through the clearing house multilaterally was over 90% in 1969.(3)

The second major step was to set up a Consejo Monetario Centroamericano consisting of Presidents of the five Central Banks to procide agreement whose implementation "may be necessary to achieve monetary union".(4) They have established several basic policy goals:

(i) one aim was to extend and reserve exchange rate stability and convertability. One crisis hanging over them was the Costa Rican multiple exchanges and some effort has been expended trying to prevent a Costa Rican devaluation, and to prevent a split rate being used to give Costa Rican a preferential rate for the regional market. Another problem was the acute balance of payments crisis faced to a greater or lesser extent by all countries in the region in 1968; eventually joint action to impose a tariff surcharge was accepted.(5)

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(1) Though this was the first tangible step there was commitment in the General Treaty to persue coordinationed policies to preserve exchange stability.

(2) The credit limit was subsequently extended to $2m.

(3) Most settlements are multilateral, but there are direct dollar settlements too.

(4) Consejo Monetario Centro americano "Hacia la Union Monetaria Centro americana San Jose, Costa Rica, 1968.

(5) This was the San Jose Protocal: SIECA "Protocal sobre medidas de defensa de la balanza de pagas, "June 1968.
These measures that were collectively agreed despite ratification problems, resulted in a 30% surcharge on the tariffs of all extra regional imports: and 'optionally' a 10% consumption tax for 'non-essentials'.

(ii) it was hoped to expand the multilateral clearing system and this has been done widening credit limits, and in financing an increasing amount of Central American trade and also extending it to Mexican payments.

(iii) greater mutual help has been extended to deal with cyclical fluctuations in the balance of payments. To this end it has been argued successfully that a Central American Stabilisation Fund should be established ; a kind of mini-IMF, empowered to make short term loans to deficit countries. This represents a partial pooling of reserves (5-10% effectively or $4m. each) and in view of the fact that there are three major export crops all with different problems there are considerable economies in the pooling of reserves.(1) The Fund was involved in its first major lending operation with Costa Rica in December, 1971.(2)

(iv) has been standardisation of credit laws: in March 1968 it was agreed to have common banking practices, including bills of exchange, letters of credit, management cheques, certified cheques, payments systems and commissions.(3)

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(1) It derives from SIECA/Consejo Monetario: "El problema de Balasza de Pagos y la Integracion Economica Centroamericana" SIECA/CEC/CMCA/MM-1/.T.2. Guatemala. The Fondo Centroamericano de Estabilizacion Monetaria" was established on February 1st, 1970. It offers short-term credit on a discretionary basis and is concerned with overall, not intra-regional deficits. In these respects it conforms to the pattern approved of by the IMF who are concerned with avoiding "introverted" mini-IMF's operating on a regional level to finance "regional" deficits. Articles by D. Segal and R. Triffin in M. Wionczek: "Latin American Economic Integration" op. cit.

(2) Also United Nations "Payments Arrangements among Developing Countries for Trade Expansion" UN TD/B/80 1966.

(3) Bank of London & South American Review, June 1968 p.327.

However, there is no immediate indication of a common money being established. Also it is necessary that monetary unification should take place at the correct rate of exchange, and would involve acceptance of loss of sovereignty[1]. If the attempt is made to early before the processes of political and economic integration are sufficiently achieved the abortive results could set back the Central American integration movement.[2]

There are thus considerable limitations of the Central American monetary integration, it has advanced as far as most other schemes in developing countries. Only in UDEAC and UDEAO is there a common currency, the French franc. There is a joint Central Bank too, and reserves are pooled, but national banks can make fiduciary issues for credit purposes and thus the arrangement falls short of total monetary integration. In East Africa this used to be the case: there was a common currency backed by the common reserves of a currency board. This has now reverted to a situation where there are separate currencies, reserves and Central Banks.

LAFTA has rudimentary clearance scheme set up in 1965 between seven partner states, but further progress is limited by the considerable exchange rate

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(1) e.g. It would be necessary under full monetary integration to have co-operation over increases in the money supply at a national level which closely affects balance of payments position of partners. Over the 1966-70 period the money supply increased by less than 1% p.a. in Nicaragua; 12·5% p.a. in Honduras; 14% in Costa Rica; 0% in Salvador and 4% in Guatemala (IMF International Financial Statistics). It is clear that there have been sufficient divergences to create some degree of disequilibrium. Over the sixties differential rates of money supply increase have been correlated with price increases (prima facie) and thus with competitiveness in intra-regional and extra-regional trade.

(2) From: R. Krieger "Problems of currency unification in Latin America theory and policy", in R. Hilton (Ed.) "The Movement Towards Latin American Unity", op. cit.

instability, different rates of inflation and controls which are shift in most countries. Monetary integration is not envisaged. The Montivideo Treaty , instead, sets out the principle of reciprocity which is that trade imbalance should be dealt with by negotiated liberalisation to the advantage of the deficit partner; a clumsy and time consuming process and also one which holds back the integration arrangements. The Mahgrab, RCD and Arab arrangements have not taken monetary integration further than the discussion phase.(1) Also it is interesting to note that the future evolution of COMECON is being hampered very largely on the 'monetary' question: surplus countries acquire inconvertible currency (roubles usually) which cannot be used for other purposes than importing from Russia.

To summarise; Central American countries have advanced through three stages in monetary integration; first, there is acceptance of a medium of account (the "peso") and local currences are an acceptable medium of exchange with the backing of convertability; second, there is a clearing system for multi-lateral payments and third, there is a credit system for trade disequilibria. But there is no common currency, no generally pooled reserves and monetary policies are uncoordinated.

IV Fiscal Integration.

Another aspect of economic sovereignty which appears incompatible with a common market arrangement, at least in some aspects, is an independent fiscal policy.(2) In so much as a customs union involves a common external tariff, some harmonisation is implicit. Consumption taxes, if not applied

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(1) An Arab Monetary Fund has been proposed and in the meantime there are bilateral agreements.

(2) D. Dosser: "Economic Analysis of Tax Harmonisation" in C. Shoup (Ed.) "Fiscal Harmonisation in Common Markets" Vol. 1 and 2, 1967.

uniformly impede trade flows and can be discrimatory. If factor mobility is an important goal of policy then substantial differences in income and corporation tax rates and social welfare payments can bias factor flow movements. Most significant of all is the fact that given the crucial importance overseas private investment in manufacturing industry, differences in tax rates and fiscal incentives may bias overseas investment to some locations regardless of other distributive effect and of the cost, in fiscal terms, of competing for its favour.(1)

Fiscal integration in Central America is advanced, largely due to the heavy dependence of the region on the external tariff for revenue purposes. (32% in 1966; and 42% at the inception of the Common Market in 1959).(2)

The Central Americans have also succeeded in achieving a joint Central American Agreement on Fiscal Incentives drafted in 1962 on the basis of Article 19 of the General Treaty and finally agreed in 1969,(3) which is to prevent the Central American nations vying with each other for overseas investment by offering tax exemptions on profits and duty drawbacks on raw material and machinery imports. The agreement does not "significantly reduce

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(1) The effect of this depends upon double taxation agreements.

(2) Fiscal harmonisation in Central America is discussed in M. Gillin "The Fiscal Aspects of the Central American Common Market" in C. Shoup op. cit. and V. Watkin: "Taxes and Tax Harmonisation in Central America" Harvard Law School 1967.
M. Munoz: "Seminario sobre problem atica y institutional de la integracion economica centroamericana sobre el conversio de incentivos fiscales al desarrollo industrial" 12-344-A. Guetemala (SIECA 1966).
S. Wiese and H. Pinada: "Primer informe general sobre los probelmas de la harmonisation tributaria en Centro-america" SIECA 1968, 3-761-C.
United Nations(E.C.L.A.) "La politica tributaria desarrollo economico en Centro-america" CE/CN 12/CCE/66. 1966.

(3) The 7-year delay was due to the failure of Honduras to approve. Acquiesence was obtained in March 1969 when Honduras was allowed by separate protocol to extend tax exemptions for longer periods and at higher levels.

the liberality or number of the tax benefits granted to new industries which remain extremely generous".(1) However, the purpose of this paper is not to evaluate the policy of giving tax incentives, whose effectiveness as a stimulant to investment in toto (rather than to individual competing countries) is open to considerable doubt;(2) rather to record the existence of an agreement and that "the agreement clearly represents an important step forward in relation to the chaotic situation currently prevailing".(3) The basic principle has been to "level down" tax benefits on existing industries, and to "level up" benefits for new industries; and to ensure that import duty exemptions are uniform except for the special position of Honduras.

A tax reform programme on a collective basis has also been proposed by a joint Organisation of American States/Inter-American Development Bank team, involving taxation of sales, prosperity and income but the chances of general acceptance are not very great (4) and have been implemented only in Costa Rica and El Salvador.

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(1) Clark Joel: "Tax incentives in Central American development": Economic Development and Cultural Change. Jan. 1971 pp. 229-252. Incentives vary according to whether or not the project is "very useful" (capital goods and other goods with 50% value-added Central American), "useful" (adding less local value added) and "non-essential" consumer goods and assembled products with low value added. A distinction is also made between "new" and "existing" industries.

(2) Various surveys conducted on Central America and elsewhere and recorded by Joel indicate that income tax exemptions have scarcely any effect at all on overseas investment. There is more dispute about the value of import duty exemptions. J. Heller and H. Kauffman: "Tax incentives for Industry in less Developing Countries", Harvard Law School 19631 are sceptical even about that.

(3) C.Joel, ibid. p. 234.

(4) Pan American Union/OAS: "Report on the Central American National Development Plans and the Process of Economic Integration" 1966 op. cit. Appendix I. When these joint proposals were due to be enacted in Guatemala, the Vice-President of the Republic, speaking as a "Social Revolutionary" (the most "left" party in the country which is legal) denounced the whole notion of "progressive" income tax as a product of the "international communist conspiracy". The legislative rejected the (very modest) proposals. (Press reports).

Fiscal harmonisation is about as advanced as in any other area. In East Africa, income and corporation taxes have their structure established regionally and are administered regionally as well as the external tariff (i.e. about 75% of all revenue). Uniformity of rates has been maintained by agreement rather than by law, but differences have recently appeared (1) and evidence of increased irritation as a result of the budgetary inflexibility has become apparent. Fiscal redistribution has also been phased out. There is no joint policy for dealing with overseas investment and customs duty drawbacks have become common in Kenya. UDEAC also had a tradition of fiscal harmonisation and a commitment to equalise tax rates that affect regional trade, but divergencies in "harmonised" direct and indirect taxes have appeared.(2) In this area there is also a joint "Convention on Investment". The joint treatment of overseas investors has also been a crucial feature of the setting up of the Andean Group and (most remarkably) produced a combined policy covering both 'Marxist' Chile and 'free-enterprise' Colombia on a most sensitive issue.(3) CARIFTA also envisages cooperation over fiscal

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(1) For example Tanzania and Uganda have "development taxes" which were a disguised form of rise in income tax. There are also differences in the "consumption taxes" that are applied.

(2) There are differences in rates of income tax and corporation tax. P. Robson: "Economic Integration in Africa" op. cit. p. 218-9. UDEAC also has the important "compensation fund" and "tax unique" as part of its fiscal harmonisation.

(3) Under "Decision No.24" there are common rules for the treatment of foreign capital, and on trademarks, patents, licences and royalties. The five countries accepted the need for common controls over repatriation of profits, over the sectoral destination of investment, over relationships between local banks and multinational companies, and over the need for local part ownership. Specifically there is an objective of 51% local ownership in 15 years in multinationals.

The other attempt to treat investors uniformly (but less restrictively) is implicit in the Conseil d'Entente "Mutual Aid and Guarantee fund", in West Africa.

incentives. Communist economies have singular problems in respect of fiscal harmonisation and even the EEC has so far failed to achieve agreement on anything more than the bare outline of a common taxation system.

V. Harmonised Project and Sectoral Coordination and Joint Planning.

So far we have been largely concerned partly with what Tinbergen has called 'negative integration' or the elimination of trade barriers, as well as measures of harmonisation (of taxes and monetary systems) to ensure expanding competition.(1) In this respect the development of the Central American Common Market is relatively advanced. However, we now need to look at joint cooperation of a more positive kind.

(a) Planned coordination of Industrial Projects: as one of the main aims of common market arrangements is to realise economies of scale in manufacturing there is a need to ensure that large scale plants are not unnecessarily duplicated in the various parts of the regional market nor delayed because of fear of implication; and also that any monopoly or near-monopoly resulting, should be controlled effectively or exposed to competition: and to ensure an equitable distribution of investment.(2)

In Central America the need for industrial coordination was recognised at an early stage and "the system of Integration Industries" was established in 1958 and later incorporated in the General Treaty. At that time there was a clear perception of the need to plan out the "Common market" industries for which preliminary studies had been carried out.(3) Designated companies(4)

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(1) J. Tinberger: "International Economic Integration" New York 1965 p.76.

(2) The arguments are set out in detail in Ch. 4.

(3) United Nations (E.C.L.A.) "Possibilidades de desarrollo industrial integrado en Centro-america" (Mexico 1965) Vol.II E/CN 12/CCE/323/Rev.1.

(4) Designation is possible where "the minimum capacity requires that they have access to the Central American market to operate in reasonably economic and competitive conditions". (Article II).

were accorded free trade, duty free imported inputs, and special tax benefits, and tariff protection against any competing regional enterprises diminishing over a ten year period.(1) In return they were to be tightly controlled as regards location, capacity, price and quality, and local participation. However, in practice this ambitious idea made only a nominal, largely psychological contribution to integration. Under the 'regime' only two separate enterprises have been established; a tube and tyre factory in Guatemala (GINSA) and a complex producing caustic soda and insecticides in Nicaragua (HERCASA-ELPESA), while a flat glass plant has been designated, but not established.(2) Applications have been made for factories for nylon filaments, pulp and paper, iron and steel, but in view of the lack of use of the scheme it is widely regarded as a failure. Another regional instrument, the "Special System of Productive Activities", which accords free trade and tariff protection industries "of particular interest",(3) had no licensing function or powers of direction and could scarcely be classed as representing project cooperation.(4) The only other attempt in this respect was the joint textile plan which attempted to negotiate by prior agreement new investment in the 1967-70 period and which appeared to have been adhered to (the protocol of Managua specified tariffs and agreed allocation of capacity). However, in general terms Central America has had "a failure of serious coordination to avoid duplication and especially any regional allocation of recourses has yet to come,(5) though hope has been expressed in the

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(1) Details of the benefits are described in Ch. 4. The benefits were somewhat eroded when free trade became almost universal and with the increasingly generous tax concessions offered to most investors.

(2) I. Walter and W. Vitzthum, op. cit. p. 41.

(3) SIECA: "Sintesis del Mercado Comun Centroamericana", Guatemala 1968.

(4) See Ch. 4. The special ('Etereo') system was introduced in the 1st Protocol to the convention on Integration Industries 1965.

(5) J. Nye: "Central American Regional Integration", op. cit. p.38-39. The Integration Industries scheme is evaluated in: J. Cochrane "Central American Economic Integration: the Integrated Industries' Scheme" Inter-American Economic Affairs, Vol. 19 1965.
D. Ramsett: "Regional Industrial Development in Central America" Praeger 1968
M. Wionczek: "Integration Economica y Distribution Regional de Actividades Industriales" Trimestre Economico No.131. (Mexico) and "Application a Africa Oriental del la experiencia del programa de integracion economic Centroamericana" in Industrialisation and Productivity Bulletin (United Nations) Bulletin 11 (S67.II. B10). pp.15-31.

"Modus Operandi" that some attempt will be made to reassert government control at a multinational level.(1)

Most of the common markets being compared have attempted arrangements of this general type. As one would expect, the centrally planned COMECON economies have advanced the furthest, but nevertheless the 'international socialist division of labour' is still very incomplete and the East European economies still have strong autarchic features. Much specialisation is intra-industrial rather than inter-industrial; specialisation within petrochemicals, iron and steel products, engineering, in machine tools especially, rather than in broader categories.(2) The R.C.D. scheme while not being particularly concerned about free trade has advanced plans for industrial coordination and some projects are being implemented.(3) UDEAC also has control over multi-national operations in as much as investment decisions in 'common market' industries need to be approved collectively: though disputes over an oil refinery location have seriously affected the operations of the group.(4) LAFTA did attempt to promote a system of complementarity agreements involving specialisation of production between two or more partner states:(5) of the small number of industries which have been dealt with, chemicals, data processing equipment, radio values, electronic equipment and domestic appliances only chemicals could

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(1) Economist Intelligence Unit. Quarterly Bulletin , 1970. No.4. San Salvador however opposes the idea.

(2) United Nations: "Economic Integration and Industrial Specialisation among Member Countries of the Council for Mutual Economic Assistance" op. cit., p.26.

(3) Nurul Islam: "Regional Cooperation for Development" op. cit. Amongst the projects currently being implemented are the Alwaz aluminium plant in Iran. Others being planned are plants for locomotives, oil refining, petrochemicals, cotton linters, pulp, wires, cables and ballbearings.

(4) P. Robson: "Economic Integration in Africa" op. cit. p. 214-15.

(5) Complementary agreements are dealt with under articles 15-17 of the Montivideo Treaty and permit free trade and common protection for products subject to agreement between two or more partner states, though agreements are extended to cover location, size of plant etc. They tend to be more like the "Special Industry" agreements of Central America than Integration Industries and cannot strictly be classified as joint industrial planning.

be said to be fundamental; and there are sufficiently few to consider the scheme a failure. The Andean group has already formulated plans for specialisation especially in petrochemicals where arrangements have been agreed in 1971,(1) and twenty products are scheduled for sectoral agreements including steel and cars. The East African Common Market has abandoned attempts to regulate specialisation following the failure of the 1964 Kampala Agreement (apart from some licensing powers)(2) and the new Community arrangement has been severely criticised because of this.(3) Generally, industrial coordination in unplanned economies has proved to involve contradictions that are extremely difficult to resolve. Nevertheless, the powerful case for an integrated approach propels most integration schemes to persist with various instruments; and new ones like that of the Mahgrab and the Andean Group to approach overall integration via this route rather than via free trade.(4)

b) Non-industrial project/sector cooperation: one of the main themes of the thesis(5) will be the limiting effect of infrastructural deficiencies on general and transport costs in particular, on intra-regional trade and industrial coordination. If we take transport costs first, in the case of a low unit value product such as bulk gains, timber or cement the cost may be equivalent to a fair tariff; and more important are the intangible effects of poor communication

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(1) "Projecto de Acuerdo de Complementacion sobre Productos de la Industria Petroquimica." While within the Andean group, this proposal has the legal framework of LAFTA's complementarity agreements under the Montivideo Treaty. This agreement involves trade liberalisation, a common tariff, common treatment of investment and most important, coordination of investment, size and location. Others are to follow; metals, cars, paper, glass etc. under the 'Cartegena Agreement'.

(2) Under the 1967 Treaty; the licensing of a restricted number of activities continues up to 1984.

(3) . Julius Nyerere has recently gone on record deploring the effect which the absence of a joint industrial policy is having in fragmenting the future steel, tyres, lorries, paper and fertiliser industries. (Africa Research Bulletin. Jan./Feb. 1971)

(4) One might mention the Organisation of Senegal River States which has a project sharing agreement and plans; the Conseil d'Entente which plans to allocate cement, tyres and petrol production ; the Dahomey/Togo Cement plant.

(5) Chapter 5. The problem is discussed more generally in A. Scaparlanda: "The role of transportation in the economic integration of underdeveloped areas". Land Economics 1966.

in discouraging economic intercourse. The retardation of economic integration in Central America for 100 years owes more to this factor than any other, partly as a result of nationalism and the distortion of the economies in favour of extra-regional trade;(1) partly a result of topographical difficulties.(2) The problems of Central America are by no means as serious as in more widely dispersed LAFTA where trade is mostly dependent on a highly inadequate system of merchant shipping,(3) and whose problems are compounded by congested and inefficient ports. The R.C.D., CARIFTA, and Arab Common Market have comparable problems. This factor may partly explain the preference for more compact groups like CACM, EACM and UDEAC, though even here "economic distance" may be very different from "geographic distance".

The situation in Central America in the pre-integration period was such as to make intra-regional trade largely prohibitive.(4) Since then considerable effects have been made to establish a regional highway system based on the 1963 Central Highway Plan; though implementation remains under national control and a good deal of effort has gone into helping Honduras with

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(1) The role of infrastructure weakness as an impediment to regional integration in Latin America is discussed in E. Angulo: "Transportation and intra-Latin-American Trade" in M. Wionczek (Ed.) "Latin American Economic Integration" op. cit. C. Castillo: "Growth and Integration in Central America", op. cit. I.R. Brown: "Transport and the Integration of South America" Brookings (Washington) 1966. In as much as transport costs are an obstacle to trade, they also of course inhibit the destabilising penetration of markets of the weaker partners.

(2) S. Hansen: "Economic Development of Latin America" 1951 p.341-45 deals with the enormous costs and technical problems involved in constructing the Central American stretch of the Inter-American highway.

(3) R. Brown, ibid.

(4) United Nations: "El Transporte en Centroamerica". (E/CN. 12/356) Mexico. 1954.

its national infrastructure problems.(1) The 1965-69 Plan envisaged 13 highways of 5321 kms and, by 1968, 3368 kms were completed.

There have also been attempts to coordinate improvements of ports.(2) Other projects which have been collectively developed is a joint telecommunications project, COMTELLA, which involves a regional microwave system and is concerned with "unification, development, modernisation of Central American telecommunications". And as far as other aspects of 'infrastructure' are concerned, the five countries have failed to agree on a joint airline though they do have a joint navigations system (COCESNA); there is better coordination of postal services and electrification is being jointly studied.(3)

Superficially long though this list may be the cumulative total is not impressive. It is less advanced than the 'colonial' inheritance of integrated joint services (as in Africa). The East African Community did not break up the system of joint administration of railways, harbours, ports; and the regional airline.(4) Since independence, the major weaknesses in the regional highway network are being rectified. Despite some disagreements there has until recently been a joint plan for electric power with considerable trade between Kenya and Uganda.(5) UDEAC also acquired initially the same range of joint services though they have started to disintegrate.(6) The Mahgrab

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(1) Also with a regional orientation was Transport Consultants Inc. (for CABEI) "Central American Transportation Study" 1965.

(2) SIECA (working group on maritime transport and port development). "Analysis y Perspectivas de la situacion Portuaria en Centro-America" 1968

(3) United Nations (ECLA) Reports of Sub-Committee on electrification e.g. "Estudio Comparativo de costos de la electrification en Centro-america and Panama" E/N12/CCE. ASC/5/6. The implementation of specific schemes is still far away.

(4) The location of the headquarters, however, has been moved in the interest of "regional balance".

(5) The massive Tan-Zam railway project is another aspect of this coordination, going outside the community.

(6) P. Robson: "Economic Integration in Africa" op. cit. pp.228-9. e.g. the posts and telecommunications agency has been decentralised.

Union has attached a good deal of importance to infra-structural coordination of airline and air maintenance services, maritime transport, railways and roads, and posts and telecommunications. R.C.D. has promoted a joint airline and shipping company, and a good highway from Karachi to Ankara is now complete. The COMECON group has also encouraged railway coordination, and a joint-post and telegraph system.

c) Agriculture and Raw Materials: the theory of economic integration as outlined in Chapter 1, the rationale was concerned with industry. Nevertheless a common agricultural policy may be crucial to an integration scheme from several aspects;(1)

(i) as a provider of inputs to regional industry,

(ii) as a source of additional exports to partner states which may have been unable to obtain a proportional share of the benefits on regional industrial trade,

(iii) deriving possible benefits from specialisation,

(iv) opening possibilities for regional import substitution, in foodstuffs particularly.

(v) generating economies of scale in research,

(vi) giving the integration group additional 'bargaining power' in negotiating collectively with third parties.

Many of these goals inspired the EEC agricultural policy but elsewhere, especially where industrialisation is the only major objective, this aspect is given little or subordinate attention. However, free trade in some agricultural products is an unimpeded tradition in many African territories.(2)

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(1) M. Yudelmann and P. Howard: "Agricultural Development and Economic Integration in Latin America" Allen & Unwin 1970.

(2) However, the East African Community permits quota restrictions on regional trade in agricultural produce (Article 13) while at the same time agreeing on the need for future cooperation (Article 14). An example of possible gains from scale and specialisation in agricultural production is sugar in East Africa: C. Frank: "The Sugar Industry in East Africa" East African Institute of Social and Economic Research, 1965.
The French-speaking OCAM group has also tried to benefit from specialisation and free trade in sugar.

and trade liberalisation has proceeded faster here than in other sectors, in the Arab Common Market, for example.

In Central America there are oblique references to agriculture in the Treaty, but only some products were permitted under the free trade provisions; non-elaborated products such as cotton seed, fruit, timber, fish and fibres and elaborated products like meat, animal food, leather, packaged or bottled fruit and vegetables.(1) A Sub-Committee on Agricultural Development was set up in 1964 to begin coordination.(2) The first major step forward was the Limon Special Protocol (1965) which incorporated an agreement on quotas of outside imports and on the stabilisation of prices of basic grains (maize, rice, sorghum) and the agreement became effective in law (if not in practice) in 1968.(3) The Modus Operandi envisages more intensive cooperation, with regional storage silos and a regional fund to stabilise buying prices, leading to a comprehensive regional policy. The importance of the trade in agricultural products to Honduras and the considerable scope for regional

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(1) The main exemptions are some that are likely to remain indefinitely: so too the main export products and others that await agreement (wheat and tobacco).

(2) United Nations (ELLA) "Informe sobre los trabajos en el sector agro-pecuario dentro del programa de Integracion economica del istmo Centroamericana". Mexico 1964 (E/CN 12/CCE/SC/6/2). The question of agricultural integration, present and prospective, is discussed in J.G. Villalobos: "Integracion agricola en Centro America" Revista de la Univeridad de San Carlos op. cit. Instituto Interamericano de Ciencias Agricolas de la OEA: "Coordinacion y integracion de la investigacion agro-pecuaria en Centro America y Panama" Guatemala 1968. Mission Conjunta de Programacion para Centro America: "Lineamientos de un programa de desarrollo agro-pecuario para Centro America 1965-69" Guatemala 1964.

(3) SIECA: "Evaluacion de las Actividades de la Commission Coordinadora de Mercadas y Estabilizacion de Precios de Centro America" SIECA/AGRO PECUARIA/S Guatemala 1968.

import substitution maintain interest in the idea of cooperation.(1) There has been little evidence of the five countries using their bargaining power: indeed they have quarrelled bitterly over coffee quotas, one of their mutual interests (until 1968 when there was the beginning of an agreement). But there have been coordinated approaches to international conferences like UNCTAD. Also there is currently an active programme of export promotion outwith the region. However, there is nothing comparable to the impressive display of unity exhibited by the East African countries in their negotiations for a special relationship with the EEC or in coffee quota discussions.

d) Other Joint Services: there are other than industrial projects where economies of scale and specialisation are to be reaped: some examples in agriculture and infrastructure have been given. Universities are another: however, with the virtual breakup of the East African University and the University of Brazzaville as a regional institution, the University of the West Indies is tenuously the only truly multinational University left in the world, except possibly the University of Lesothe, Botswana & Swaziland. In Central America there is a joint school for public administration training (ICAP) but little else in the higher education field, except a rather unsuccessful University coordinating body (CSUCA).

One might in this context refer to multifaceted sectoral coordination such as the joint development of the Senegal River, the Chad Basin and the Niger in Africa.

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(1) Thus far intraregional trade has helped the achievement of a reasonable degree of self-sufficiency in food staples and vegetable oils, and dairy products have almost achieved self-sufficiency with the aid of the Common Market.

Scientific research and development is a major source of economies of scale and is one of the main arguments for economic integration in the EEC and COMECON. Even in such technologically backward areas as Central America the point is relevant and one of the most successful regional institutions is the "Institute Centroamericano de Investigaciones Technologia Industrial" (ICAITI); others are an institute for plant diseases (OIRSA) and a nutritional research centre, including Panama, (INCAP).

e) Joint Comprehensive Planning. In so much as economies are nationally planned, then with regional arrangements, joint planning is necessary for planning to remain effective.(1) "If planning is being increasingly regarded as necessary at the national level it is evident that the same imperative will be felt when a regional framework for economic development is being considered ... Among the various purposes of planning the following deserve special attention when the question of planning ... is examined in connection with the establishment of an integrated market covering several countries;

(a) equitable distribution of benefits

(b) establishing priorities

(c) avoidance of duplication" (2)

There are two stages of integrating a planning system. One is "coordination"; the other is to formulate and implement joint plans binding on all partners. As the latter would involve a considerable loss

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(1) The argument is dealt with in detail in: H. Ellis "National Development Planning and Regional Economic Integration" in U.N. Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas."

(2) UNCTAD: "Trade Expansion and Economic Integration Amongst Developing Countries" op. cit. p.32.

of economic sovereignty, as in a full economic union under laissez-faire conditions. It has not been popular, and even in COMECON, Hungary and Rumania particularly have resisted the idea of fully integrated planning. In Central America, a joint industrial plan was worked out by a Joint Planning Mission, but it was not consistent with national plans let alone binding.(1) The Central American Plans for the 1965-69 period were synchronised but inconsistent and there was very little attention to interelated aspects. The plans have subsequently been sharply criticised: "it is evident that the national plans that have been prepared so far do not contain specific elements directly designed to drive the process of specialisation of the production activities ... nor for the same reason do they lead to a systematic use of the potentialities of the Common Market". (2) Some have argued that "the execution of

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(1) Mission Conjunta de Programacion para Centroamerica: (Guatemala 1965) "Bases para un Programma Centroamericano de Desarollo Industrial". Pan American Union Organisation of American States; "Resumen de las Programas Centro-americanas de Inversiones Publicas" 1967. Pan American Union/OAS.

(2) "Informacion sobre los Planes Nationales de Desarollo y el Processo de Integracion Economica de Centroamericana" op. cit. pp.14-15, 85.

separate national development policies has been at the bottom of most of the frictions in the Central American organisation".(1) In the post 1969 period there has not even been synchronisation.

This pattern is repeated in most other groups yet all pay lip service to the need for plan coordination and "consultation"; LAFTA (Resolution 100 of the Montivideo Treaty), the Andean Group, the Arab Agreement for Economic Unity, the R.C.D., the Mahgrab Group, UDEAC, East Africa and the West Indies. The most thorough going coordination has been attempted in COMECON over the 1961-65 and 1966-70 planning periods where basic macro-economic aggregates (investment, trade, output) are adapted to regional targets.

However, much of this discussion is quite academic as there is, despite the voluminous documents produced, no serious planning in Central America. There is a large and growing school of sceptics who argue that there is little intrinsic value in comprehensive planning in underdeveloped private enterprise economies, which is often undertaken largely to obtain aid and possibly to amuse economists;(2) "the Planning Office (in Latin America) is little more than a facade presented to the naive and ignorant, a screen behind which foreign loans are obtained to maintain and strengthen the existing political and economic system".(3)

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(1) SIECA Carta Informativa 61 (1966) by (Snr. Delgado).

(2) P. Waterston: "Development Planning: Lessons of Experience" John Hopkins 1965.
W. Stolper: "Planning Without Facts" Cambridge (Mass) 1966.

(3) K. Griffin & J. Enos: "Planning Development" Addison-Wesley 1970 p.204.

for the present economies ?

Their scepticism would have a good basis in Central America (except possibly Costa Rica) where there are very poor statistics;(1) a small government sector and no tradition of intervention and controls over the private sector; a large agricultural and foreign trade sector subject to random fluctuation; economic decision-making and expertise concentrated in orthodox monetary and budgetary institutions, especially the Central Banks; and political instability. Some effort was made in Costa Rica to monitor the progress and check implementation of the 1965-69 Plan and the 1969-74 Plan is more sophisticated in its model building and more specific in its disaggregation. The other countries are less ambitious and Nicaragua has not attempted another Plan at all. Generally, however, there appears little future for comprehensive planning on a multinational basis. More manageable, and more immediately relevant, is coordination at a project and sectoral level.

f) Factor Mobility. The distinction between a common market and a customs union is normally made on the basis of factor mobility. Factor mobility may be important where there are complementary needs: when one country has unemployed labour and is short of land and capital (or skilled labour of a certain kind), compared with another which has abundant land and supply of capital but an inadequate labour force; and where factor proportions are sufficiently inflexible to prevent factor substitution. In this sense factor movements are a substitute for trade. However, as in the theory of free trade or the pure theory of customs unions, positive

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(1) Appendix 1.

gains depend on ceteris paribus assumptions about perfect competition, full employment etc. In practice, unless real world conditions do simulate to a high degree a 'perfect' market (if necessary by eliminating differences in taxation and social security payments), then factor mobility is just as likely to be 'perverse' and to contribute to "agglomerative" tendency with scare factors moving to artificially favoured locations.(1)

Though the General Treaty did contain a general commitment to factor mobility, in Central American conditions it is marginally relevant. Unemployment, and human as well as physical capital scarcity are basic economic problems in all five countries, and differences of income, labour productivities and skill are greater within countries than between them. Only in the case of labour relative to fertile land, which is scarce in Nicaragua and underdeveloped parts of Guatemala and excessive in Salvador is there possible scope for transfer. However, labour migration is also subject to national law, and there has been only limited migration of workers. Very few central Americans live outside their countries of origin,(2) and the largest flow, from El Salvador to Honduras was illegal and helped to start a war.(3)

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(1) The theory is set out in B. Balassa: "The Theory of Economic Integration" op. cit. Ch.4.

(2) R.S. Smith: "Population and economic growth in Central America": Economic Development and Cultural Change. Jan. 1962. pp.134-149.

(3) V. Cable: "The 'Football War' and the Central American Common Market" in "Latin America and the United States in the 1970's:" (Ed.) C. Gray. Florida University Press 1971.

The near convertibility of currencies permit a good deal of movement of regional capital and closer monetary integration would facilitate it. Local capital is, as evidenced by Guatemalan exchange controls, as much sensitive to political uncertainty as to differential rates of return, and there is no developed capital market even on a national level.(1) Proposals have been made for a regional capital market,(2) but it is difficult to see how it would be of any value unless there has been a "notable charge in the traditional preferences of the monied classes for investment in real estate or for investment outside of Central America".(3)

In fact the whole debate about intraregional capital flows is academic in this context as a large proportion of invested capital, especially in those industries engendered by the Common Market, is extra-regional, mainly American, and not constrained by inter-country barriers in Central America.

Elsewhere in developing countries, the limited relevance of intra-regional factor mobility has led to its being treated as low priority. The three 'colonial' customs unions had some mobility of labour, but post independence administrations are now instituting strict immigration controls. Intra-regional capital movements have been largely determined by the degree of monetary integration. In few other integration schemes outside Europe has factor mobility ever been a major goal of the union (the Arab Common Market is exceptional) and implementation is generally poor.

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(1) Excepting El Salvador which opened a stock exchange in 1964.

(2) C. Weekly: "Towards a Central American capital market" Journal of Common Market Studies. Vol. 7 (1968-9) pp. 119-128.

(3) I. Walter & W. Vitzthum: op. cit. p.60.

What, however, is a good deal more relevant than intra-regional mobility as conventionally understood is common treatment of overseas investment. To some extent, the Central American Agreement on Fiscal Incentives goes some way towards achieving this but it is a less radical and all embracing form of control than that envolved by the Andean countries which involves harmonising regulations governing profit repatriation, and local ownership.

Perhaps the most conspicuous innovation to develop regional capital market institutions and to influence the flow of overseas private investment to common markets has been the growth of regional development finance banks. They have been associated with Common Markets in developing countries for several reasons. First, the banks can conveniently be used for regional projects under conditions where national banking institutions are not willing to take the risk of committing themselves to projects dependent on exports to a regional market; second, the bank can be used as a form of concealed "income distribution" between the main partner states and, therefore, has advantages in helping to eliminate inequalities that are generated; third, they are a means of 'pump-priming' or raising funds from aid donors who are sympathetic to integration efforts. The advantages are sufficiently obvious that regional and subregional development banks have proliferated.

The Banco Centroamericano de Integracion Economica (CABEI) was established in Tegucigalpa in 1961 after a ten year gestation period.(1) The various governments contributed $4m each and loans or grants have been raised from the U.S. Mexico, the Inter-American Development Bank and European countries accounting to $150m: of this total $60m has the form of a low interest Fund for Central Integration which gives low interest loans for infrastructure projects and was initiated by a U.S.A.I.D. loan: and of the $170m financial resources in January, 1968, $112m had been invested.(2) The principles of operation are that investments should take place (i) primarily for regional projects, (ii) to promote 'balanced growth', (iii) for economically sound projects only. In fact the first condition has not always been met as there is a good deal of lending for housing projects (about 10%) and many of the industrial loans (about 40%) are not for projects which depend, other than peripherally, on the Central American regional market.(3) The largest amount of lending is mainly from infrastructural investment in roads, power and telecommunications. Despite criticisms of its efficiency,(3) CABEI has been one of the more popular regional

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(1) The operations of the Bank are discussed in M. Ordonez Fernandez; "El Banco Centroamericano en el processo de integracion economica" University of San Carlos, LXXI op. cit. 1969. Also in the 'Memoria de Labores, Annual', issued by the Bank.

(2) By 30th April, 1969, the financial resources had risen to $250m. ($215m from overseas); total lending had reached $150m. and this figure had risen to $193m. by the beginning of 1970. SIECA Cartas Informativas.

(3) Criticisms of the Bank are quite serious. Clearance takes considerable time, partly because of the need to clear projects with USAID (which also limits its independence); little 'regional' industry per se has been encouraged; there has been little mobilisation of local capital and the 'redistributive aspect' has been extremely weak. (See Ch.5.)
P. Schmitter: "Central American Integration:spillover, spillaround or encapulation?" op. cit. pp. 9-10

institutions and it has been a very successful 'pump-priming' agency.(1) Its activities have survived the war; so much so that the Modus Operandi has designated it the most useful mechanism for breaking the present deadlock and it is proposed to establish a 'special fund' to lean even more heavily to Honduras (and Nicaragua) in lending policy.

Modelled on the Central American Bank is the one recently established in East Africa though the East African Development Bank is much more directly concerned with redistribution.(2) A cornerstone of the Andean Group is the "Andean Development Corporation" which plans considerable industrial lending.(3) A Caribbean Development Bank has also been established involving Bahamas and British Honduras as well as the CARIFTA group,(4) and the Mahgrab group established a small regional bank.

The other regional banks exist more independently of the formal integration arrangements and support them only indirectly. The African Development Bank which commenced lending in 1967 has not yet had enough operational experience to evaluate, but it has shown itself very anxious to avoid outside control by equity participation and its early lending has been entirely on African funds. Quite different in orientation, the Asian Development Bank put into operation in December, 1966, embracing both Asian and non-Asian countries, with 40% of the initial capital of $1,000m. subscribed by donor countries;(5) The Inter-American

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(1) Ibid p.9. "members seem to be aware that without it they would have received less individually....".

(2) The Bank is an integral part of the Treaty, aiming to promote industrial development and give priority "to industrial developments in the less industrially developed partner states, thereby endeavouring to reduce the substantial industrial imbalances between them"; and to finance projects which make for "complementarity". Not least Only industrial projects are eligible. Subscriptions are equal but loans and investments are to be allocated on a $\frac{3}{8};\frac{3}{8};\frac{1}{4}$ basis between Uganda, Tanzania and Kenya.

(3) The Corporation was established by formal Agreement in 1968. Unlike the other groups it is only concerned with industrial and service enterprises directly related to the integration process.

(4) The Bank is due to have initial capital of $50m;. 60 .

(5) OECD. "Economic Cooperation in Asia" op. cit. p.

Development Bank, which came into existence as early as 1960, has been more actively involved with promoting economic integration. The bank is based in the USA and has been very active in obtaining finance from bond issues, commercial capital markets, and from the US Government as aid. In its first six years it had lent $2,000m. Its role in promoting economic integration has been through a pre-investment fund to undertake feasibility studies in potential multinational projects, and a fund for extending lines of credit for intraregional exports of capital goods on terms as good as those offered by exporters from industrialised countries.(1)

Even in those areas where no financial institution yet exists, there are plans; especially in the Mahgrab. The Arab nations have the Kuwait Fund for Arab Development, which is a partial substitute. Even COMECON is trying to float a regional investment bank.(2) Generally speaking, regional development banks have proved a useful adjunct and stimulant to economic integration, especially where they have channelled extra funds to the area, and where they have used their position to promote specifically regional projects which might otherwise have involved cumbersome international negotiations.

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(1) P. Herrera: "The Inter-American Development Bank and Latin American Integration" in M. Wionczek (ed.) "Latin American Integration" op. cit. and "The Inter-American Development Bank and the Latin American Movement": Journal of Common Market Studies, Dec. 1966. pp.172-181,
Inter-American Development Bank: "Multinational Investment in the Economic Development and Integration of Latin America". op. cit. pp.150-179.

(2) Report in The Times: July 27th 1971.

Conclusions and Some Explanations

The Central American countries are seen to have been more successful than an almost all other integration arrangements amongst developing countries in establishing a customs union and in harmonising their institutions to accommodate free trade. They have been very much less successful in developing a framework of planning to develop intermediate and capital goods industries.

This fits badly into the rationale set out in Ch. 1, and the consequences of this disjunction are spelled out in Ch.4. However, what are the reasons for this form of development? This takes us into the field of politics, but that cannot be avoided.

Perhaps the most important factor, which explains the early success of the CACM in building a free trade area, has been the avoidance of steps which involve an enroachment on the political discretion of national leaders and national sovereighty. Clearly, trade liberalisation and other integration instruments do implicitly involve loss of sovereignty; through loss of customs revenue; and the loss of control over industries unable to withstand regional competition. On the other hand, any steps to transfer major decision-making functions to SIECA, (or any other supra-national executive body), such as control over industrial location, control over new tariffs, a regional budget and distributive pool, were firmly resisted and decisions were subject to national ratification. Equally, there was virtually no attempt to move to political unification directly, (the regional body coordinating foreign affairs - ODECA - and the regional body coordinating military activities - CONDECA - have played a subdued and relatively unimportant role). Integration was

economic and non-contraversial.(1)

This form of evolution was related to the fact that the dominant 'pressure group' for integration were the 'tecnicos', senior officials, economists, ministers of economic affairs, all professionals by training with no political constituency; the 'integration mafia' they have been called. Most were influenced by the fashionable ideas of Prebisch and the ECLA 'school', possibly only superficially in some cases, but in other cases informed by cosmopolitan experience. The Common Market appears to evoke relatively little interest amongst the main political components of the ruling classes; the Army, the landowners, and the Church. Even potentially threatened groups, such as the weaker local industrialists and overseas importers were mollified in the first case by relatively favourable experiences and in the latter by a sharp rise in the propensity to import and neither are, in themselves, dominant groups. Labour unions and peasants have negligible influence except in Costa Rica. Political leaders appear to have accepted the moves to unity, deriving 'kudos' from successful initiatives which did not threaten them directly.

External influences were exerted also by the United Nations (E.C.I.A.)

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(1) The argument in this paragraph is a rough paraphrase of the views contained in A. Segal: "Integration and developing countries: some thoughts on East Africa and Central America", Journal of Common Market Studies, March 1967. pp. 89. J. Nye: "Central American Regional Integration" op. cit. J. Cochrane: "The Politics of Regional Integration: the Central American Case" op. cit.

team in the first instance (up to 1960). Later (after 1959) the United States, the main aid giver, trade partner and investor, reversed its previous general indifference, seeing the opportunities which might arise for overseas investment and for enhancing political stability. They have patronised the CACM (or these parts of which they approve) through loans to regional institutes (mainly CABEI) and informal support.

However, those conditions, which made integration easy at first, are now very considerable handicaps. The absence of deep political commitment and partial political unification meant that in the absence of what Nye calls a "myth of irreversibility" and of long run objectives and pooled sovereignty, the common market was extremely vulnerable and lacking in allies once the common market controversies did acquire political, especially nationalistic, overtones as with the major bilateral deficit of Nicaragua, 1969, and the "war" which led to Honduras' withdrawal. Similarly, the acceptance of 'national sovereignty' as a constraint on all major decisions meant that the most relevant instruments, such as a regional investment policy, have never been developed. This step has also been prevented by the opposition of the United States, whose assistance was so important in the earlier stages. Integration 'by stealth' has proved counter-productive. However, the crucial determinant of continued integration and its possible deepening are material net gains flowing from the union and that all states are at very least no worse off within the union than outside it. Ch. 3 will address itself to this question.

Chapter III Performance, Benefits and Costs of the Central American Common Market and the Distribution of Benefits and Costs (1)

This chapter attempts to test three propositions:

(a) that the Common Market has made a significant net contribution, both to regional industrialisation and to regional G.D.P., sufficiently so as to justify its continuation.

(b) that the net gains are badly distributed, such that there is good reason to believe that Honduras may have made a rational economic choice in withdrawing in 1971. This would imply that the "balancing mechanisms" of the Common Market are defective.

(c) that the Common Market has, so far, largely been exhausting the possibilities for "easy" import-substitution aided by a wider market opportunity but has made virtually no progress in attracting the basic "building-block","intermediate", "economies of scale" industry for which the Common Market was designed: and, again, this might imply a defective institutional structure.

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(1) When this chapter had been prepared in final draft the author obtained a copy of D.H. McElland, "The Central American Common Market" Praeger, 1972. This was the first major attempt to calculate benefits, and the methodology appeared to be as rigorous as the data permitted. Much of McElland's work was very similar in approach, and used similar data to mine, though arrived at quite independently of the author (we did have a brief exchange of ideas in 1969 in the U.S.A.). The chapter has been re-written to accommodate references to McElland's calculations and I felt justified in going over, to some extent, the same ground, if for no other reason than to dispute a central point in McElland's case - fundemental to his argument, though not deeply explored - that no country appeared to have "lost" from membership.

It is necessary to calculate the balance of advantage from participation in regional integration for several reasons. Firstly, nations enter into an arrangement of this kind either to increase their national income or to minimise the cost of industrialisation, and in order to establish its success (or otherwise) we need to quantify the effect as precisely as possible. Secondly, as we have seen in Ch. 2, and we shall see again in Ch. 4, an equitable distribution of gains is a precondition of the success of regional integration , and the measurement of equity may be necessary for political reasons. In the absence of attempts by economists, governments (notably Nicaragua) have gauged "success" by their bilateral trade balances with their partners, a dangerously misleading factor, based on the implicit assumption that regional trade is a 'zero-sum game'.

However, there are fundamental difficulties involved in making a numerical calculation. There is an "identification problem". A formal integration agreement may be only one of several inter-dependent factors influencing trade flows and economic growth; and in Central America there was simultaneously a commodity export boom, an increase in fiscal incentives to business and a major road building programme. A further difficulty is that in order to establish the costs and benefits of regional integration, we need to contrast this situation with another hypothetical situation - that of non-integration.

The

This hypothetical question can be put in three ways.(1) First, what would have been the gains and losses to partner states, historically, had there been no integration arrangement? This question is of no relevance for policy, is purely academic, and requires time series data over a respectable period: in this case the Common Market has only existed from 9 to 14 years, depending on one's definition. Second, what would be gains and losses now from partner states withdrawing or remaining assuming the alternative was autarky or another specified group? This question is more easily answered but it is a 'comparative static' question which must overlook the dynamic, long term effects of the union on raising productivity, on the stimulation of innovation and new industries, the mobilising of unemployed resources, and the gains from economies of scale. Because these factors are multifarious and cumulative rather than simple and immediate in effect, it is difficult to see how they could ever be satisfactorily quantified. Third, what will be the gains and losses in the future from withdrawing from or remaining? This approach runs into considerable difficulties because of the problems of projection. However, the question of relative expectations is crucial, especially as in Central America, two countries in particular (Honduras and Nicaragua) might well expect a favourable response from concentration in their traditional exports of cotton and bananas.

There are also aspects of membership which convey a sense of 'gain' or loss but which are not even potentially reducible to income terms; the

(1) P. Robson: "Economic Integration in Africa" op. cit. p.131-2, and also in United Nations: "Current Problems of Economic Integration: Fiscal Compensation and the Distribution of Benefits in Economic Groupings of Developing Countries", UNCTAD, Geneva, 1971, p.8.

"psychic" gains from raising a stronger industrial base, consumer satisfaction (or disatisfaction) with greater (or lesser) variety of goods; broader horizons and the experience, hitherto denied, of freer movement and closer conduct with neighbouring countries; or for Costa Rica, the political "costs" of association with undemocratic neighbours. There are also more specialised aspects of the 'gain' and 'loss' account which include the effects of economic integration on fiscal receipts; and the balance of payments - both treated not in "income" terms, but as independent policy variables.

Unfortunately, these problems are often glossed over and too many Central American studies have merely accepted the superficial index of a rapid intra-regional trade growth rate and a possibly spurious correlation between growth rates and common market membership; e.g. "during the years in which the Common Market has been in effect, the level of economic activity has noticeably increased in Central America .... it seems reasonable to conclude that during 1960-67 the Common Market has acted as a stimulus to economic advancement",(1) or "the expansion of trade among the Central American countries is a clear indication of the immediate results of the integration programme".(2) However, there are others who have remained sceptical. Schmitter described how regional growth has improved the "image of regional integration ... but there is doubt as to the extent and depth of its contribution ... and the contribution of regional trade expansion and economic cooperation to this sustained, but fading, burst of prosperity has been marginal".(3)

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(1) D. Ramsett: "Regional Industrial Development in Central America" op. cit. pp.27-28.

(2) J. Moscarella: "Economic Integration in Central America", in M. Wionczek: "Latin American Economic Integration" op. cit. pp.272-273.

(3) P. Schmitter: "Central American Integration: Spillover, Spillaround or Encapsulation" op. cit. pp.15-16.

Indicators of Growth and Structural Change

Bearing in mind all that has been said about the 'identification problem', about the complex chain of causality, and about the quality of statistics, it is nevertheless of some interest to consider initially some of the major economic changes that have attended the integration progress, whether or not they are wholly caused by it. Changes in trade composition or industrial structure, for example, tell us how successful the countries have been in developing some kind of industrial base.

Diagram 3-1 gives some indication of changes in key macro-economic variables in the three periods 1950/62; 1958/62; 1962/69, which can be roughly used to evaluate performance in the pre-; post- and transitional periods of the Common Market. In the case of Guatemala there is a significant improvement in real economic growth and economic growth per capita, and in manufacturing growth; while regional exports have grown very rapidly and extra-regional exports at a rate significantly less than real G.N.P. In El Salvador there is no discernable improvement in G.N.P. per capita, but a slight improvement in GNP and manufacturing growth: extra-regional exports have grown slowly and intra-regional exports very rapidly. In the other three cases, substantial improvements have occurred in GNP, GNP per capita, and manufacturing, but in all three, extra-regional exports (cotton and bananas) yielded a high growth of proceeds and it is much less evident what separate contributions the common market made: indeed in Honduras the growth of regional exports was less than that of exports to the outside world.

Diagram 3-2 gives a measure of structural changes in the economies. There is a marked decline, both pre- and post-common market, in the relative

Diagram 3-1 Main Economic Changes in Central America

I. Guatemala	1950-62 % p.a.	1958-62 % p.a.	1962-1969(70) 1969 value	1962-1969(70) %p.a.
GDP in const. quetzales (1958) million	3·5	4·2	1,679	6·1
GDP per capita " "	·6	·9	328	2·8
Exports outside Central America -millions (current prices)	-	·2	169	2·4
Exports to CACM-millions (current prices)	-	2·8	86·4	20·9
Manufacturing product -value added - million	4·5	4·9	260	7·6
II. El Salvador	**1950-62**	**1958-62**	**1962-69**	
GDP in const. 1962 colones (million)	4·6	4·8	2324	5·3
per capita GDP in 1962 colones	1·8	1·3	686	1·8
Exports outside the regions in current prices - million	-	2·2	180	1·4
Exports to the region current prices -million	-	22·3	778	17·8
Manufacturing product - value added - million	5·7	7·6	450	8·3
III. Honduras	**1950-62**	**1958-62**	**1962-69**	
GDP in 1948 lempiras (million)	3·4	3·9	905	5·1
GDP per capita in 1948 lempiras	·6	·75	362	2·5
Exports outside Central America - current (million)	-	1·9	142	10·6
Exports to Central America - current (million)	-	1·5	23·9	7·5
Manufacturing Product (1948 lempiras -million)	7·6	6·6	14·5	8·9
IV. Nicaragua				
GDP in 1958 cordobas (million)	-	5·5	4640	6·3
GDP per capita 1958 cordobas	2·8	2·6	2429	3·5
Esports outside CA - current cordobas (million)	-	5·6	128	5·5
Exports to CA (million)	-	2·2	30·8	2·3
Manufacturing Products 1962 Cordobas (million)	7·9	5·4	756	9·8

(continued)

V. Costa Rica	1950-62	1958-62	1962-69	
GDP in 1962 colones (million)	6·4	9	4970	8
GDP per capita	2·7	-	-	-
Exports outside CA	-	5	154	7·4
Exports to region	-	9	36·0	26
Manufacturing product (1962 colones)	7·3	5·8	960	10·3

Sources: United Nations National Accts; Joint Planning Mission; El Salvador 1968/72 Plan; Honduras 1969 Central Bank Report; Nicaragua 1969 Central Bank Report; Costa Rica 1968/72 Plan.

Diagram 3-2 Structural Changes in Central America (in %)

	Guatemala			El Salvador			Honduras		
	1950	1962	1968	1950	1962	1970	1950	1962	1970
Agriculture; Forestry & Fisheries	32.1	30.5	26.6	31.0	32.2	27.2	51.5	45.5	35.8
Mining Manufacturing	12.0	13.4	16.1	16.8	17.3	19.5	11.7	15.4	15.6
Construction	2.8	2.1	1.8	1.4	1.4	2.7	6.2	3.8	5.2
Electricity, Gas & Water	4.1	6.6	1.3	3.5	3.1	1.5	5.0	7.7	1.3
Transport & Communications			4.3			5.1			6.6
Government (Civil Services & Defence)	5.6	5.6	5.2	5.3	6.4	7.7	2.3	3.1	3.0
Misc. Services			5.6			8.4			8.2
Ownership of Dwellings	40.5	41.8	7.2	34.1	34.2	3.8	23.2	24.5	-
Commerce & Finance			38.8			24.0			16.6

	Nicaragua			Costa Rica			Mexico	Norway
	1950	1962	1970	1950	1962	1970	1967	1967
Agriculture; Forestry & Fisheries	46.5	38.1	26.7	34.8	32.4	23.2	12.8	7.4
Mining Manufacturing	12.4	14.2	20.5	11.3	14.2	19.5	1.0 23.9	1.1 27.2
Construction	2.2	2.8	3.2	3.4	3.8	4.6	4.4	7.5
Electricity, Gas & Water	2.8	6.4	2.0	4.4	7.0	1.8	1.5	3.0
Transport & Communications			4.9			4.1	3.0	19.4 (Shipping)
Government (Civil Services & Defence	5.6	5.0	8.0	4.7	9.6	10.7	5.6	4.5
Misc. Services						9.5		
Ownership of Dwellings	30.7	30.1	12.8	28.3	33.0	6.8	47.8	30.0
Commerce & Finance			21.4			19.8		

Sources: 1950-62 Joint Planning Mission and generally UN Yearbook of National Accounts

P.T.O.

importance of agriculture and a counterbalancing rise in that of services and manufacturing even though the latter constitutes in all cases a small sector with under 15% of GNP. The direction, if not the magnitude, of the change is entirely expected and is attributable to higher demand elasticities and the multiplier effects of traditional commodity export growth, as well as to common market trade, 90% of which is in manufactures.

It is, perhaps, more revealing to look at the patterns of "normal" development, traced in Appendix III. There is a general tendency for the "D" factor to rise, but only in the case of El Salvador and possibly Costa Rica, has there been a dramatic movement from "below normal" to "above normal" levels of manufacturing after the integration process began. In Guatemala, significantly enough (significantly because intra-regional trade is the only autonomous factor apparently responsible for improved growth performances), manufacturing has increased less rapidly than elsewhere and has remained at the same "sub-normal" level.

Diagram 3-3 carries the analysis of industrial changes to a more detailed level. There is a continued, if modest, shift from "traditional" industries, as defined in the appendix, to "intermediate" industries in particular, which is in line with "normal" industrial development; this classification in this way is necessarily arbitrary (textiles, for example, would include "new" and "intermediate" products such as rayon and nylon cloth). In the integration period there have been growth increases well above the average in the three countries for which data is available, in paper products, petrol refining, chemicals and engineering industries, but all figures start from a very low base and in each country the traditional industries constitute over 70% of manufacturing value added even in the late nineteen sixties: and this is excluding the very small firms.

Diagram 3-3 Structural Changes within the Manufacturing Sector

Industry Group	1955 (Region as a whole) % of V.A.	1962 (Region as a whole) % of V.A.	El Salvador 1967 %	El Salvador % p.a. increase 1962-67 in const prices	Nicaragua 1968/69	Nicaragua % p.a. increase 1965/69 in const prices	Costa Rica 1968 %	Costa Rica % p.a. increase 1963-67 const prices	Honduras 1968 %	Guatemala 1967 %
Traditional										
20 Food	26.4	33.7	28.5	6.3	34.0	12	24.0	7.4	27.6	
21 Drink	16.4	14.2	10.0	7.5	13.5	22.5	10.0	5.4	12.1	
22 Tobacco	6.0	6.1	3.9	4.4	5.3	4.3	2.9	4.2	3.1	
23 Textiles	10.0	6.9	10.2	17.5	4.9	7.0	6.6	19.0	3.1	
24 Clothes	17.3	13.1	14.2	11.0	4.2	2.9	6.6	6.2	9.0	
25 Wood	4.1	3.3	.3	2.4	2.2	17.9	6.7	6.2	7.0	
26 Furniture	2.1	3.0	1.3	15.7	1.8	14.3	2.7	7.4	1.6	
28 Printing	2.2	2.4	2.3	14.5	1.4	14.7	3.0	9.9	2.7	
29 Leather	1.4	1.6	.7	1.7	1.2	18.9	1.0	3.3	.7	
Total	83.7	84.3	73.8	8.9	68.5	—	64.0		76.9	78.6
Intermediate										
27 Paper	.2	.8	.7	9.9	1.5	18.5	1.0	18.9	2.9	
30 Rubber	.5	1.0	.7	10.6	.7	25.2	2.0	21.0	1.4	
31 Chemicals	4.3	4.6	8.3	25.4	10.4	10.3	8.8	13.9	7.6	
32 Petrol	—	—	4.4	16.5	3.9	4.2	5.0	—	2.8	
33 Non-metal minerals	4.1	3.8	4.4	16.5	4.8	13.4	4.2	17.6	6.4	
34 Basic Metal	.2	.1	.8	36.7	—	—	.8	44.0	—	
Total	9.3	10.3	19.3	21.8	21.3	—	21.8	—	21.1	11.0
Capital										
35 Engineering	.9	1.6	1.5	15.7	4.1	9.1	3.4	25.0	2.8	
36 Transport equip.	.7	.4	.8	23.1	—	—	2.2	24.0	.1	
37 Construction equip.	.3	.4	2.8	52.3	1.4	48.3	2.5	47.0	.2	
38 Electrical equip.	1.5	1.9	1.5	5.2	1.2	6.9	2.7	11.9	5.8	
Total	3.4	4.3	6.4	34.0	6.7	—	11.0		8.9	10.4
Others 39	1.4	1.1	2.6	13.7	3.5	18.4	3.2	34.0	3.1	
	100.0	100.0	100.0	11.7%	100.0	12.0%	100.0	11.4%	100.0	100.0

Sources: As in Diag. 3-1 and 3-2.

Table 3-4 shows changes in import source as between extra-regional and intra-regional supplies. Extra-regional imports have shown an annual increase of over 5% over 1958-68 and the composition has changed markedly with a reduction in the proportion of consumer goods, especially non-durables, and fuels, and an increase in the proportion of other raw materials, intermediate and capital goods, especially transport equipment; in fact, to a more rigid import structure. Intra-regional trade growth has been concentrated very largely in non-durable consumer goods which accounts for half the increase, and capital goods (except construction materials) are still of negligible importance. Table 3-5 breaks down imports and exports by the S.I.T.C. classification. It shows how the exports of categories 0 to 4 (foodstuffs and raw materials), are totally dominant among exports outside Central America both in 1960 and 1968; while regional exports for all countries except Honduras are bunched in the Right categories. Regional trade is seen to be providing a trade outlet for manufactures, which is further underlined by Table 3-6 showing the destination of exports by product-category. The U.S.A. and W. Europe take insignificant quantities of manufactures (the U.S.A. takes less than Panama which is the only significant importer of manufactures outside Central America); while those areas which have a comparable economic structure to Central America (ALALC and CARIFIA) do virtually no trade.

Diagram 3-4 Source of Imports by End-use category

$m.

	1958	(%)	1963	1964	1965	1966	1967	1968	%	% annual i 1958-68
Diag I Imports from outside Central America										
Consumer Goods (non-durable)	89.2	33.4%	120.1	131.0	135.8	93.1	94.3	97.6	23.2%	.9
Consumer Durables	66.8		64.0	71.4	81.6	86.7	86.7	86.8		2.
Fuels	32.1	39.4%	43.7	42.7	43.1	41.8	16.8	16.4	45.4%	-7
Primary Materials	156.3		176.0	204.1	239.5	245.6	334.6	348.1		+
Construction Materials	31.3	26.8%	35.6	41.8	49.7	45.5	38.6	38.6	30.7%	2.
Agricultural capital goods	15.1		22.6	27.4	29.8	23.8	23.6	22.9		4.
Industrial Capital goods (i.e. machinery)	61.9		83.6	103.3	122.1	128.4	149.8	136.0		8.
Transport equipment	9.9		29.9	31.1	49.2	53.9	56.6	45.5		16.
Diverse	2.2		3.9	2.6	5.4	10.2	2.4	2.2		-
Total :	464.7	100.0%	579.9	663.5	755.3	769.0	816.4	794.2	100%	5.
Diag II Intraregional imports										
Consumer Goods (non-durable)	9.0	4.8%	36.3	52.6	70.7	90.9	96.4	114.6	5.1%	
Consumer Durables	.7		2.8	3.8	6.3	10.6	10.8	15.0		
Fuels	-	35.5%	3.7	4.9	8.4	1.8	4.3	3.9	38%	
Primary Materials	7.1		22.1	34.9	41.9	51.9	79.0	92.1		
Construction Materials	1.2	16.5%	4.9	6.2	8.3	10.2	16.6	18.8	11%	
Agricultural goods	.5		.6	.8	1.2	1.7	2.7	2.9		
Industrial Capital Goods	1.1		.7	1.1	2.3	4.1	3.2	3.9		
Transport equipment	.2		.2	.4	.3	.2	.9	.7		
Diverse	.2		.5	.8	.9	2.6	.1	.1		
Total	20.2	100.0%	71.8	105.5	135.3	173.9	214.0	252.0		

Sources: SIECA Carta Informata IO:5, Statistical Annex; and UN Balance of Payments Yearbo

Diagram 3-5 Trade by SITC Categories ($m.)

SITC categories 0-4 : non manufactures
5-9 : manufactures.

		EXPORTS				IMPORTS			
		Total		Regional		Total		Regional	
		1960	1968	1960	1968	1960	1968	1960	1968
Guatemala									
Foodstuffs SITC	0	96.4	124.7	2.6	16.7	13.6	22.5	2.6	8.3
Drink+Tobacco	1	.2	1.8	.2	1.9	1.3	1.3	.1	—
Raw materials-non fuel.	2	12.5	50.6	.3	3.0	1.7	5.4	.2	.7
Fuels	3	—	—	—	—	13.9	—	—	.4
Veg oils.	4	.1	1.7	.1	1.8	1.6	3.3	.5	.6
Chemicals	5	1.3	12.0	.7	10.6	20.2	46.9	.8	11.2
Manufactures	6	1.5	28.0	2.0	28.1	37.7	72.8	2.2	16.2
+ Machinery	7	—	2.9	.6	3.6	36.3	70.6	—	3.4
Others	8	.7	11.1	.7	11.6	11.2	20.5	1.1	8.4
	9	—	—	—	—	—	—	—	—
Total		110.2	232.9	7.3	77.5	137.8	249.4	7.6	49.4.
El Salvador									
SITC	0	92.4		4.4	10.9	17.2		7.5	18.1
	1	.2		.3	.2	1.7		.8	1.2
	2	16.5		.3	.9	1.7		1.0	5.0
	3	.1	—	—	3.6	7.3	—	—	.2
	4	1.0		1.1	1.6	1.4		.2	2.2
	5	1.4		1.4	14.8	18.6		.5	9.1
	6	3.5		3.4	31.1	30.5		2.0	19.0
	7	.4		.3	5.1	31.2		.5	2.6
	8	1.2		1.5	16.5	12.7		.8	5.3
	9	—		—	—	—		—	—
Total		116.8		12.7	84.9	122.4		13.5	65.1
Honduras									
	0	47.0	126.6	4.7	13.8	8.0	19.7	2.1	10.6
	1	.6	2.9	.6	.6	.4	1.4	—	.8
	2	12.6	30.6	.8	2.2	.3	1.8	.2	.5
	3	—	2.1	—	—	6.2	12.5	—	2.9
	4	.3	6.1	.3	.4	1.6	2.0	.2	.8
	5	.1	5.6	.1	5.6	10.3	26.2	.4	7.2
	6	.9	—	.3	4.1	22.1	53.3	1.2	13.6
	7	—	4.5	.2	.3	12.2	48.6	.5	2.1
	8	.3	—	.3	4.2	6.6	18.4	.7	10.3
	9	—	—	—	—	—	—	—	—
Total		61.9	179	7.4	31.3	71.8	184.7	5.3	48.7
Nicaragua									
	0	29.2	60.8	2.7	9.6	5.2	18.1	.6	5.7
	1	—	.9	—	.2	.8	.9	—	—
	2	23.8	76.6	.2	.5	1.1	2.0	.1	2.2
	3	—	—	—	.2	6.9	10.0	.1	.1
	4	—	4.0	—	.7	.7	1.3	.3	3.0
	5	—	4.4	—	8.7	13.7	41.0	.5	5.4
	6	2.2	6.7	.3	14.5	20.2	43.6	.4	6.4
	7	—	.3	.1	3.1	15.8	48.9	.4	.5
	8	—	—	—	8.8	5.4	17.5	—	—
	9	—	—	—	—	1.4			
Total		62.9	157.2	3.4	46.2	71.7	183.3	2.8	26.
Costa Rica /									

	Exports				Imports			
	Total		Regional		Total		Regional	
Costa Rica	1960	1968	1960	1968	1960	1968	1960	1968
0	80.4	132.9	.5	8.6	13.3	21.9	2.0	9.4
1	—	.1	—	—	.8	1.6	.1	.6
2	1.0	3.4	—	.3	.6	4.1	.1	1.9
3	—	.3	.1	.1	6.2	9.8	—	.2
4	.4	.2	—	.2	.6	3.2	.4	2.9
5	.2	8.9	.2	6.3	17.8	37.0	.2	6.4
6	.3	10.9	.2	10.2	33.7	67.8	.4	16.7
7	—	4.0	.2	3.4	28.9	48.3	.1	2.2
8	.5	8.7	.5	8.4	8.3	20.2	.1	8.6
9	3.1	1.3	—	—	—	—	—	—
Total	85.8	170.8	1.7	37.7	110.4	213.9	3.5	48.8

Source: United Nations Trade Statistics Yearbook; SIECA Cuarto Compendio Estadistico and Cartas Informativas.

Diagram 3-6 Central American Exports by Destination and Product Category (1968 in $)

Destination / S.I.T.C. Category	0	1	2	3	4	5	6	7	8	Total
CACM	53·4	2·5	7·6	3·4	6·6	40·6	76·8	11·7	43·3	2·47
ALAIC (Latin American Free Trade Area)	·2	-	1·4	-	1·1	1·0	·1	·1	·1	4
CARIFTA (West Indies)	-	-	3·1	-	-	-	-	-	-	3·5
N. America	285·6	3·4	15·7	-	-	1·4	2·8	·1	·4	314
W. Europe	171·4	-	46·2	-	·4	·7	·8	-	-	218
Rest of the world	49·5	-	103·8*	2·8	·1	2·6	1·7	1·1	·7	164
Total	560·2	6·0	178·1	6·2	8·2	46·3	82·2	13·0	44·5	951·3

Notes: 1.* includes Cotton to Japan in exceptional year.
2. --items ignored if under $50,000; rounded to nearest $100,000

Sources: SIECA figures.

The role of regional trade as a medium for promoting manufacturing exports is brought out with greatest clarity in Diag. 3-7, where the conventional industry classification rather than trade classification is used. Agricultural products accounted in 1968 for about 10% of regional trade as opposed to 40% in 1958. The massive increases in manufacturing trade have been in absolute terms most important in "traditional" industry, notably textiles, shoes, clothes and processed foods, but the rate of increase has been greatest in intermediate industries especially chemicals. The base quantities are so low, however, that percentage increases mean very little.

Nevertheless, it is important to identify those components of regional trade which constitute a "dynamic" element and an attempt is made in Diag. 3-8 to pick out over 1962-70 four categories on a three digit SITC basis- "fast growers" (where regional trade is growing significantly faster than average), "slow growers" (where regional trade is growing significantly slower than average), "average growers" and "zero-growers". In the first category are rayon, nylon type textiles, "diverse" chemicals (mainly insecticides), "general" manufactures (in which plastic goods are prominent), pharmaceuticals, electrical equipment (mainly batteries and cables), glass bottles and organic chemicals. In the second are clothing, perfumes and cosmetics, shoes and also metal manufactures, tyres, animal food and miscellaneous prepared foods. "Slow" growers (still rapidly growing in some cases relative to trade as a whole) are cotton thread and woven material, margarine, paints, leather, wood and fresh vegetables. Other products appear to be growing not at all or falling in absolute terms; fuels, fertiliser, sweets, unmilled maize, rice, cattle and furniture.

It is also interesting to note the extent to which regional trade

Diagram 3-7: Regional Trade by Sector-origin Categories

	1958	1968
(values in $m. cif imports)		
Agricultural products.	8·0	26·6
Mineral Products	·26	2·0
Services	·1	·1
Manufactures	11·7	223·0
by C.I.I.U Categories.		
(1) Traditional		
20 Food - Human	3·6)	34·7)
Animal	·5)	5·8)
21 Drink	·5	·6
22 Tobacco products	·2	1·4
23 Textiles	1·1	45·1
24 Clothes	·7	7·2
25 Leather goods ex. shoes	·2	2·7
shoes	·4	7·1
26 Timber products	·9	5·0
27 Furniture	-	2·0
28 Printing products	·1	2·0
Total Traditional	8·2	123·5
(2) Intermediate Goods		
29 Paper products	·3	7·6
30 Rubber goods	·1	7·3
31 Chemicals - industrial	·4	14·9
- others (largely pharmaceutical)	·2	26·4
32 Petroleum products	-	3·2
33 Glass & glass products	-	2·9
Other non-metal minerals	·3	3·6
Total Intermediate	1·3	65·9
(3) Engineering - Capital Goods		
34 Metals - iron & steel	-	8·4
others	-	1·1
35 Metal Products generally	·3	9·6
36 Machinery ex. electrical & transport	·8	2·2
37 Electrical equipment	-	10·9
38 Transport equipment	·5	1·2
	1·6	23·9
Others	·9	4·7
plus Plastic products	-	4·5

Sources: SIECA Statistics.

Diagram 3-8 Major Commodities in Central American Intra-regional Trade

Product	1964	1966	1968	1970 (m.$)
(1) Fast Growers				
Textiles of Fibres (rayon etc.)	1.6	4.3	8.2	17.2
Diverse Chemicals	3.1	5.5	8.9	13.5
Pharmaceuticals	1.8	4.1	8.6	12.5
General Manufactures	2.4	5.0	7.5	12.3
Electrical equipment	1.7	5.5	9.1	11.8
Iron & Steel	.85	4.4	8.3	9.0
Glass products	—	.5	2.8	5.4
Organic chemicals	—	.7	2.2	3.0
Non-metal minerals	—	.7	1.4	2.7
(2) "Average" Growth				
Clothing	6.2	12.9	17.7	19.4
Perfumes; cosmetics, soaps & toiletries	5.3	9.4	13.4	15.6
Cotton textiles	4.6	7.9	13.3	15.3
Shoes	3.7	8.0	9.4	12.7
Metal Manufactures	2.6	5.0	8.1	9.3
Tyres	1.4	4.8	6.2	6.2
Food preparation	1.0	1.8	3.8	5.0
Animal Food	.6	1.8	2.6	3.4
Paper	.6	1.2	2.0	2.9
(3) Below "Average" Growth				
Paper & pulp products	3.5	5.2	5.9	8.2
Fresh vegetables	5.1	5.1	8.2	9.3
Cloth material	2.6	4.5	5.9	5.7
Margarine	2.0	3.6	5.3	4.3
Paints	1.7	2.2	2.8	3.0
Leather	1.1	1.8	2.2	2.9
Wood	1.1	2.0	2.4	2.8
(4) No growth				
Fertilisers	6.4	3.0	2.8	5.0
Sweets	2.8	3.5	3.9	3.8
Furniture	1.6	3.5	3.6	3.4
Fresh fruit	2.0	2.5	3.3	2.8
Unmilled Maize	4.4	4.4	3.5	2.6
Live animals	4.8	4.3	3.8	2.6
Rice	.6	1.6	4.6	2.4
Petrol	4.9	1.8	3.2	1.7

Diagram 3-9 showing the relative importance of intra- and extra-regional inputs ($ '000)

NAUCA group		Imports			Regional Trade		
		1960	1964	1968	1960	1964	1968
013-00	Meat Preparations	1,049	659	950	35	447	2,212
024- 01	Cheese	252	411	346	134	319	804
042-00	Rice	588	1,346	300	347	511	4,590
051-01	Fresh Fruit	1,194	500	558	509	2,002	3,289
053-04	Fruit Juice	225	419	241	247	1,086	1,200
054-02	Beans	192	97	1,281	1,123	3,458	5,500
054-09	Other Vegetables (fresh)	70	223	26	658	1,020	1,745
055-02	Vegetables (processed)	944	675	600	26	506	1,321
062-00	Sweets & Chocolates	627	251	212	703	2,823	3,870
091-02	Vegetable & Cooking oil	2,428	191	66	820	1,370	4,188
121-01	Tobacco (pure)	1,670	1,125	564	470	685	789
243-00	Timber	213	32	148	771	2,223	2,198
533-03	Paints	2,480	626	1,801	435	1,700	2,450
541	Medicines	20,363	30,704	33,000	194	1,845	8,566
552-02	Soap (washing)	2,608	960	857	305	6,431	6,342
599-01	Plastic Materials in bulk	14,641	17,211	13,180	3	6,431	3,831
561	Fertilisers	4,394	7,680	15,543	74	500	3,196
611-01	Leather	3,109	2,312	1,493	155	1,144	2,177
629-01	Tyres	7,725	7,983	6,992	236	1,438	6,070
651	Cotton Yarn (spinning)	7,789	11,666	19,000	1,224	2,907	5,141
652	Cotton fabrics (woven)	24,588	19,978	8,860	1,000	4,589	13,312
653-05	Artificial fibre (woven fabrics)	7,271	10,929	12,308	1	1,490	5,141
656-01	Sacks	1,786	977	713	243	1,583	2,350
661-02	Cement	2,178	1,734	450	97	1,567	2,213
699-21	Metal Containers	1,440	3,058	3,904	193	599	1,916
642-01	Articles of Paper & Pulp	3,524	9,300	1,122	272	3,463	4,859
721-02	Electric Batteries	2,416	1,587	659	-	1,372	3,528
821-01	Furniture (wood)	367	227	418	134	580	1,132
821-02	Furniture (metal)	1,477	983	1,252	70	713	1,566
841-01	Socks & Stockings	1,666	789	156	135	1,020	3,773
841-02/03	Underwear & Clothing	1,558	1,860	1,570	248	2,005	6,744
841-04/05	" & "	2,704	1,705	1,192	265	246	5,001
851	Footwear	852	332	284	626	3,669	9,395
899-07	Plastic Household Articles	496	449	601	11	3,601	1,509
899-11	Other Plastic goods	1,113	1,682	1,998	236	790	2,339

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is in some respects performing a regional 'import substitution' function and in other respects is due to heightened competition between existing producers.(1) Diagrams 3-9 shows very clearly how for some products (e.g. paints, leather, woven fabrics, sacks, cement, batteries, clothing and shoes) the impetus to regional trade has been import-substitution. Competition between existing producers has led to the development of intra-industry rather than inter-industry specialisation: and Diagram 3-10 shows how far products such as textiles, clothing and shoes, such product specialisation is well advanced.

So far developments have been described in general rather than precise terms. To what extent, then, is the growth of the region or the manufacturing sector directly related to the existence of the common market and, in particular to the growth of regional trade? To answer this, two basic approaches were adopted. The first was to try to find statistically significant correlations between economic growth and the various apparently independent and autonomous influences such as the growth of traditional exports, regional trade or another proxy measure of the "Common Market effect", and government investment. The second approach was to try to isolate the various components of regional trade; the local value added generated in regional trade, the "cost" of regional trade diversion and the fiscal loss. The latter approach takes up the bulk of the chapter but the relatively unsuccessful attempts to use the first approach are recorded for completeness.

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(1) This broadly corresponded to the distinction between 'trade diversion' and 'trade creation'. It is not a distinction felt to be quantitatively very useful in this context but it is of academic interest and Appendix 5 is used for indicating the possible application of these concepts to Central America. For what it is worth, it appeared that about half of regional trade flows were "diversion" and half "creation".

Diagram 3-10 showing the degree of specialisation in intra-trade among major industrial groups (1965 + 1966 figures).

Code	Item	% of imports accounted for by major supplying country	% of imports accounted for by major importers
651-03-00	Crude unbleached cotton yarn	95% El Salvador	69% Guatemala
651-04-00	Cotton yarn bleached	88% El Salvador	59% Guatemala
652-01	unbleached cotton cloth (woven)	48% El Salvador	20% Guatemala & Honduras
652-02-03	bleached- 80g per m^2	71% El Salvador	65% Honduras
652-02-04	" 80-150g per m^2	63% El Salvador; 38% Guatemala	36% Honduras 27% El Salvador
653-05-62-01	rayon woven cloth 80g per m^2	98% Guatemala	92% El Salvador
-02	" " "	85% Guatemala	73% Honduras
841-01-02-01	ladies stockings	60% Guatemala 32% Costa Rica	43% El Salvador
	others - i.e. socks etc.	43% El Salvador	34% Guatemala
841-03-02	clothing, khit of synthetics	81% Guatemala	42% Costa Rica
841-03-04	" " of wool	68% Costa Rica	Guat.) Hond.) all circa. 30%
811-03-05	" " of cotton	56% Costa Rica	32% Guatemala
841-04-02+03	pyjamas, underclothes of synthetic fibres	42% Honduras	37% El Salvador
841-06-05	" " of cotton	36% El Salvador	38% El Salvador
841-11-01	Mats	72% El Salvador	30% Nicaragua Honduras
851-02-02	Leather shoes	60% El Salvador	37% Honduras
851-09-01	Shoes of plastic materials	39% Nicaragua	30% Honduras

I Direct Calculation of the Effect of Integration on Growth

Gains and losses could be calculated by constructing a model in which regional trade or another proxy measure of the common market can be represented as one of various independent influences acting on GDP (or another measure of welfare). The coefficients derived from regression analysis of the data may enable us to calculate the separate influence of the preference variable. Though it is less useful in this context, X-section analysis is subject to less severe problems than time series analysis and it is worth recording the attempts to incorporate preference variables in global trade analysis, notably by Tinbergen, Poyhollnen and Pullainen, and Linnemann.(1) Moreover because of the dangers of extrapolating from x-section to time series, and because of the difficulties of applying general equations to a particular context we conclude that "the methods used are ... only useful in showing that changes in trade flows did occur and in measuring the extent of these changes in general terms. They do not permit the quantitative measurement of integration effects and of the relative importance of trade creation and trade diversion".(2)

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(1) J. Tinbergen: "Shaping and the World Economy" Century Fund 1962, p. P. Poyhönen: "Towards a general theory of international trade" and K. Pullainen: "A world trade study: an econometric model of the pattern of commodity flows in international trade 1948-60" both in Ekonomiska Samfundets Tidskaft 1963, pp. 139-39. H. Linnemann: "An Econometric Study of International Trade Flows" North Holland 1966. Also see "Trade Flows and Geographic Distance" in N.G. Bos; "Towards Balanced International Growth" Rotterdam 1965, pp.111-128. Linnemann computed a relationship of the following kind from a x-section sample of 80 countries in the 1958-60 period:

$$xij = A \; Y_i^{\alpha} \; Y_j^{\beta} \; N_i^{\gamma} \; N_j^{\delta} \; D_{ij}^{\varepsilon} \; P_{ij}^{\zeta}$$

where xij is the trade flow between i & j

Yi; Yj are the GDP of i & j

Ni; Nj are the populations of i & j

Dij is a variable for "economic distance"

Pij is a preference variable

$\alpha, \beta, \gamma, \delta, \varepsilon, \zeta$ are elasticities

A is a constant.

As a result of numerous tests (correcting for changes in commodity composition for example), it was established thqt the preference variable was very important; and it could also be shown that due to the effect of the

cont.

(2 cont.)
"size" elasticity, there is a predicted reduction in extraregional imports from a multinational grouping through trade "diversion".

(2) H. Linnemann: ibid.

Attempts have been made to adapt multi-variate models of trade to time series. In a study specifically on Central America, Nugent evolved a model in which the intra-regional and extra-regional exports and imports, of individual common market countries were traced by means of equations which incorporated as independent variables; disposable income, credit conditions, a time trend factor, import and export taxes, a dummy variable covering transport costs and a 0-1 dummy variable to represent the absence of the common market.(1) As a result of analysis of a 16 years time series and various forms of its equation, he came up with the tentative conclusion that the Common Market "explained" about 1% p.a. to GDP after 1962 (i.e. about 1/7 of the recorded growth).

Even in a complex model of this kind there are many oversimplifications(2)

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(1) R. Nugent, Discussion paper (unpublished) Yale University; seen in mimeograph form.

(2) The limited number of variables, the exclusion of lags of over two years and of distributed lags, linear functions, the absence of any commodity disaggregation. Also the dummy variables are crude; for transport a simple progression (0,1,2,3,4 .....n) and for the preference group a discontinuous series (0,0,0, ... 1,1,1) with 1960 as the date of inception of the union. Relative price changes are dealt with very indirectly by means of a crude measurement of the external tariff (tax receipts over import volume) by major SITC categories, which totally fails to measure the protective effects of the tariff as tax receipts are misleadingly deflated by the exemptions of intra-regional trade from tariffs and of inputs for many industries.

and this model is in some ways too sophisticated bearing in mind data limitations. Also until the work is published one does not have any basis for seeing what evaluation the author put on his own results.

A potentially more promising, because less complex, approach is sketched out by Ndegwa in his study of the East African Common Market (for 1954-63).(1) He did a simple regression of income (for each of the three countries) on inter-Common Market exports, extra-regional exports and gross capital formation, which three factors were aggregated into a single independent variable. As a result of this, regional exports "explained" 2/5 of Kenya's 6·7% growth rate; and 1/20 of Tanzania's 5·2% growth rate (Uganda's result was rejected because of a poor "fit"). However, the logic behind the model and selection of variables is not explained at all, and statistical significance of the results are sketched very superficially and it is, consequently, not possible to say more about methodology and the validity of the conclusions.

One of the most difficult aspects of models such as that of Nugent was the use of a satisfactory variable to represent the existence of a preference arrangement. One way of avoiding this difficulty is to look at pre-common market period and construct a projection model. This is then applied to the common market period and the difference between "predicted" and "actual" values for GDP as a residual, can with appropriate qualifications be attributed to the common market. This assumes basically

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(1) P. Ndegwa: "The Common Market and Development in East Africa" East African Studies (Makerere) 1965 pp.110-111.

unchanged conditions but provided that the most likely changing influences are incorporated in the projection model this is a not entirely unreasonable assumption.(1) There is also a considerable advantage in econometric terms since the existence of multicollinearity in time series (which is almost always present) does not prevent one making projections (assuming that the "fit" is satisfactory) even though it is not possible to separate out directly the influence of the different independent variables.

One study of this kind has been made in Central America.(2) It does not use formal regression analysis but an approximation technique out of deference to the poor data available. The assumptions are clearly spelled out and seem feasible enough. The study is thus described in some detail. The key assumptions are as follows:

(a) exports (outside the region) and to the "common market" are the only major autonomous influences on growth. The service, construction and domestic agricultural sectors are considered 'passive'; monetary and fiscal policy as unimportant and investment to be unrelated in any direct way to growth (fixed investment consisting largely of imported capital goods). In the absence of any export growth the economies would grow at a "minimum normal" or trend growth, determined by the "normal" growth of population

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(1) Similar assumptions have been made in various attempts to calculate the effects of the EEC: E. Truman: "The EEC: trade creation and trade diversion" Yale Economic Essays, Spring 1969. B. Balassa: "Trade diversion and trade creation in the EEC" Economic Journal, March 1967. Also E.F.T.A. "The Effects of EFTA on the Economies of Member States" 1969.

(2) D. McClelland: "The Central American Common Market" op. cit. Ch.2 and Appendix B, and "The Common Market's contribution to Central America's economic growth: a first approximation" in R. Hilton (Ed.) "The Movement Towards Latin American Unity" pp.508-536.

new techniques etc. (a concept similar to the "natural" rate of growth).

(b) The employment of additional resources in the export sector has no "opportunity cost". This is because of the existence of "labour slack" and because land has a specific use or is underutilised (changes in export proceeds are often due to price rather than output changes too). The treatment of capital and skilled labour is less clear - except where it can be identified as a foreign exchange cost to be deducted along with imported inputs. While acknowledging that these elements represent a resource cost he considers that "costs are of a different order from the gains".(1)

(c) There is a very high supply elasticity due to the existence of unemployed resources and this means that demand spillovers from the export sectors lead to an expansion of output, not of price; i.e. a multiplier effect. This is a very cavalier assumption and he deals very unsatisfactorily with the argument that a budget deficit in these (un-Keynsian) circumstances would not simply generate a multiplier. McClelland made the somewhat arbitrary assumption that import leakages cancel out the multiplier so there is a 1:1 relationship between export earnings and manufacturing output. This is perhaps the weakest and most arbitrary assumption of the exercise.

By looking at the 1950-61 pre-common market period he is able to "explain" the growth of that period (i.e. get a visually satisfactory fit) in terms of a minimum-normal growth of 4% (5% for manufacturing). This and the other coefficient were extrapolated over the 1962-68 period and the "residual" GDP attributed to the Common Market; which was about 1/10 of the

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(1) Ibid. p.208.

growth i.e. about .75% of GDP p.a. This conclusion is confirmed by separate calculations on the manufacturing sector, where about 50% of the growth is "explained" by the common market.

It would be easy to make criticisms of such crude assumptions but the findings have no claim to precision and the assumptions made not totally implausible. However, it should be noted that the procedure of using the "residual" as a measure of the Common Market effect is open to very serious critism: the residuals in the McClelland study were so small that they could easily have been swamped by data errors and by the influence of other activities such as government investment. The coefficients chosen are very arbitrary and an attempt at regression analysis could have yielded figures that fitted the data more accurately.

Diagram 3-11: Equations Relating the Growth of GDP (Dependent Variable), the Growth of Extra-regional & Intra-regional Trade, Government Investment and a Time Trend (1958-69)

Guatemala:

$$\log Y = 2.8930^{*} - .7004^{\log X_R} + .1742^{*\log X_w} - .8312^{\log G} + .0318^{*\log T}$$
$$(.2161) \quad (.0674) \quad (.0840) \quad (.0802) \quad (.0083)$$
$$R^2 = .9827 \qquad DW: 1.48$$

$$\log M = 1.6408^{*} - .0275^{\log X_R} + .0657^{\log X_w} + 1.408^{\log G} + .0318^{*\log T}$$
$$(.2127) \quad (.0663) \quad (.0860) \quad (.0789) \quad (.0082)$$
$$R^2 = .9915$$
$$DW = 1.60$$

El Salvador:

$$\log Y = 1.6432^{*} + .01988^{\log X_R} + .3038^{*\log X_w} + .3711^{*\log G} + .0178^{*\log T}$$
$$(.2906) \quad (.0548) \quad (.0906) \quad (.0997) \quad (.0063)$$
$$R^2 = .9907$$
$$DW = 1.88$$

$$\log M = -.3835 - .1220^{\log X_R} + .5282^{\log X_w} + .5812^{\log G} + .0314^{\log T}$$
$$(.6416) \quad (.1210) \quad (.2000) \quad (.2201) \quad (.0139)$$
$$R^2 = .9810$$
$$DW = 2.22$$

Honduras:

$$\log Y = 2.0681^{*} + .0283^{\log X_R} + .1972^{*\log X_w} + .1609^{*\log G} + .0079^{*\log T}$$
$$(.1146) \quad (.0213) \quad (.0255) \quad (.0578) \quad (.0024)$$
$$R^2 = .9967$$
$$DW = 2.35$$

$$\log M = 1.3178^{*} - .0258^{\log X_R} + .2049^{*\log X_w} + .0384^{\log G} + .0300^{*\log T}$$
$$(.2656) \quad (.0494) \quad (.0590) \quad (.1341) \quad (.6056)$$
$$R^2 = .9941$$
$$DW = 2.83$$

Nicaragua:

$$\log Y = 2.7308^{*} + .0051^{\log X_R} + .1938^{*\log X_w} + .0177^{\log G} + .0177^{*\log T}$$
$$(.1729) \quad (.0119) \quad (.0352) \quad (.0033) \quad (.0033)$$
$$R^2 = .9968$$
$$DW = 2.00$$

$$\log M = 2.3780^{*} + .0028^{\log X_R} + .0064^{\log X_w} - .3000^{\log G} + .0393^{*\log T}$$
$$(.8041) \quad (.0553) \quad (.1637) \quad (.3769) \quad (.0153)$$
$$R^2 = .9621$$
$$DW = .85$$

Costa Rica:

$$\log Y = \underset{(.2020)}{2.9627^{*}} + \underset{(.0124)}{.0022}\log X_R + \underset{(.0644)}{.0494}\log X_w + \underset{(.1010)}{.1314}\log G + \underset{(.0031)}{.0188^{*}}\log T$$

$R^2 = .9949$
$DW = 1.85$

$$\log M = \underset{(.6665)}{1.8746^{*}} + \underset{(.0410)}{.0936^{*}}\log X_R + \underset{(.2123)}{.0114}\log X_w + \underset{(.3333)}{.2523}\log G + \underset{(.0103)}{.0193^{*}}\log T$$

$R^2 = .9817$
$DW = 2.21$

3-11b. Equations Used for Projection; Relating the Growth of GDP (Dependent Variable) to the Growth of Extraregional Trade (X) and Time Trend (over 1950-61)

Nicaragua:

A. $\log Y = \underset{(.08711)}{2.72076^{*}} + \underset{(.0521)}{.2820^{*}}\log X + \underset{(.0014)}{.01633^{*}} T$

$R^2 = .9800$ $DW = 2.308$

B. $\log M = \underset{(.0851)}{1.7343^{*}} + \underset{(.0518)}{.2735^{*}}\log X + \underset{(.0014)}{.0238} T$

$R^2 = .9887$ $DW = 2.59$

Honduras:

A. $\log Y = \underset{(.0961)}{2.3579^{*}} + \underset{(.0548)}{.1325^{*}}\log X + \underset{(.0009)}{.0149^{*}} T$

$R^2 = .9633$ $DW = 1.82$

B. $\log M = \underset{(.1031)}{1.3082^{*}} + \underset{(.0017)}{.1171}\log X + \underset{(.0017)}{.0277} T$

$R^2 = .9612$ $DW = 1.88$

Guatemala:

A. $\log Y = \underset{(.1386)}{2.8395^{*}} + \underset{(.0163)}{.0022}\log X + \underset{(.0012)}{.0163^{*}} T$

$R^2 = .9767$ $DW = 1.22$

B. $\log M = 2.2806^{*} - \underset{(.0935)}{.2012}\log X + \underset{(.0016)}{.0225^{*}} T$

$R^2 = .9751$ $DW = 1.90$

El Salvador:

A. $\log Y = 2.8334^{*} + \underset{(.0492)}{.0559 \log X} + \underset{(.0010)}{.0171^{*}T}$

$R^2 = .9834 \quad DW = 1.97$

B. $\log M = 1.8118^{*} + \underset{(.1242)}{.1200 \log X} + \underset{(.0027)}{.0227^{*}T}$

$R^2 = .9452 \quad DW = 1.99$

Costa Rica:

A. $\log Y = \underset{(.0766)}{2.8920^{*}} + \underset{(.0426)}{.1751^{*}\log X} + \underset{(.0008)}{.0215^{*}T}$

$R^2 = .9935 \quad DW = 1.08$

B. $\log M = \underset{(.2146)}{2.3482} + \underset{(.1194)}{.0477 \log X} + \underset{(.0022)}{.0135\ T}$

$R^2 = .873 \quad DW = 1.29$

Notes: XW = world exports
XR = regional exports
S = government investment
T = time variable
Y = GDP
M = Manufacturing GDP
* indicates 95% level of confidence / statistical significance

Having surveyed the literature, how can it be applied? Two applications were tried. First an attempt was made to do a time series analysis for the 1958-1969 period which embraced the whole of the common market and transitional period. Two alternative dependent variables were used (GDP at constant prices and manufacturing value added) and four independent variables, (extra-regional exports, government investment, intra-regional exports as a proxy for the Common Market effect and a time trend variable.) The results are set out in Diagram 3-11.

Although the fits were generally good, a survey of standard errors of variables and substitution showed that most regression coefficients were very unstable and it was found in almost all the equations after an investigation of partial correlation coefficients that there was unacceptably high multicollinearity amongst the independent variables. No alternative transformations of the equations (e.g. to log form or taking least differences or introduction of other proxy variables) eliminated multi-

collinearity to an extent that the equations could be used for evaluating the influence of each variable separately under ceteris paribus assumptions. Also the short time period meant that the Durbin-Watson test for auto-correlation could not be applied and the D-W statistics seemed barely acceptable in general. Nevertheless, the results are not entirely without interest. In nine out of ten equations the coefficient for regional trade is statistically insignificant. In some cases the coefficient is actually negative, in most others very small indeed. The "common market" effect appears to be 'swamped' by the time trend and the effect of extra-regional exports.

Instead an attempt was made to apply the basic approach adumbrated by McClelland in an econometric form and to apply it to each country separately. The equations derived (3-11b) can be used for projection purposes even though multicollinearity is present. The findings have to be treated with extreme caution, however, bearing in mind the assumptions lying behind the projection, the poverty of data and the high standard errors of several coefficients.

The conclusions are printed out in Diag. 3-12. It appears that predicted and actual values are very close for Honduras, implying very limited gains from new influences in the post-1962 period; but there is a large unexplained "residual" for Guatemala and El Salvador and to a lesser extent for Nicaragua which appears to explain about ½ of Guatemala's and El Salvador's growth in this period and 1/6 of Nicaragua's. For manufacturing there is a similar picture. The absolute figures are generally not very reliable as they depend on doubtful statistics and unchanged coefficients but relative magnitudes are interesting.(1)

(1) Changing the base of projection from 1950-62 to 1950-58 did not greatly affect the results.
Because of poor statistical series, Costa Rica was excluded from the analysis.

Diagram 3-12 "Predicted" v. Actual Values of GDP and GDP (manufacturing)
(Projection equation Log GDP = a + b log X + c T)*

	"Actual" GDP	"Predicted" GDP on assumption of pre-CACM trend.	"Actual" Manuf. GDP	"Predicted" GDP manuf.
Nicaragua (in cordobas at constant 1958 prices				
1962	3999	3017	370	375
1966	4033	3900	541	518
1967	4245	4103	584	554
1968	4447	4278	671	588
1969	4640	4375	756	612
Honduras (constant 1948 lempiras)				
1962	629	620	76	76
1966	781	772	112	106
1967	834	807	124	114
1968	877	848	135	123
1969	905	873	145	130
Guatemala (constant 1958 quatzales)				
1962	1143	1114	151	148
1966	1394	1293	211	164
1967	1453	1344	228	182
1968	1566	1395	247	187
1969	1679	1447	260	192
El Salvador (constant 1962 colnes)				
1962	1603	1489	241	227
1966	2063	1753	371	283
1967	2176	1826	402	298
1968	2246	1895	425	313
1968	2324	1974	487	331

Sources: El Salvador. U.N. National Accts. and the 1965/69 National Plan
Guatemala: U.N. National Accts. and Joint Planning Mission.
Honduras: Banco Central de Honduras and U.N. National Accts.
Nicaragua: Central Bank; 1965/69 National Plan and U.N. National Accts.

Notes
* X is exports to world markets in current prices
T is a time trend variable
Equations are set out in 3-11b.

II Analysis of Trade Flows

Attempts to assess the contribution of the common market to regional GDP and manufacturing directly had mixed success. An attempt will now be made to look at the growth of regional trade and, if possible, to deduce to what extent its growth is due to the common market, and to infer from that what contribution regional trade makes to the GDP. The first step is to isolate that part of the trade flow, intra-regionally, which is due to the existence of a preferential group.

Let us look first at some of the methods that have been used to calculate the impact of integration on trade flows:

(1) Tariffs and price effects: in as much as a customs unions arrangement involves the reduction of tariffs in one direction and their consolidation in another, measurement or prediction of the effect of tariffs on demand could be made by a study of elasticities. Various ex-ante studies have been made, for example, of the effect of the EEC, EFTA and a possible North Atlantic Free Trade Area, using estimates of the prices elasticity of demand for imports. Knowing the extent of a proposed tariff cut and assuming an infinite elasticity of supply and an absence of income "feedback" from any tariff changes, then changes in the trade

flows from a tariff change can be predicted.(1) This procedure has been used by Andic, Andic and Dosser to predict the effect of a customs union in the West Indies.(2) In Central America one study was made adapting this approach:(3) it was based on the original work of Verdoorn who estimated (ex-ante) the gains from Western European integration.(4) Verdoorn took an elasticity of substitution between import demand and import substitutes (effectively the price elasticity of demand) of ·5 and income elasticity of 2·0. Tariffs are assumed constant for all products and countries; other changes influencing prices assumed away; factor supplies held constant; and the rest of the world treated as a single country. The same assumptions and coefficients were used by May in predicting the effects of a Central American Common Market and he estimated that complete trade liberalisation in Central America should have added $8·6m over the 1959 figure of $29·4m for regional trade. The wildly erroneous predictions of May's study should alert us to the limitations of this kind of approach. It may be of use for ex-ante calculations where nothing else is available but scarcely otherwise. At all event, the accuracy of values for elasticities is crucial to establish the magnitudes of trade flow changes attributable to economic integration and these are highly elusive. Work done subsequently in order to predict the effect of the San Jose Protocol

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(1) L. Krause: "The EEC and US Balance of Payments" in W. Salant (ed.) "The United States Balance of Payments in 1968" pp.95-118 and "European Economic Integration and the United States" Washington 1968.
H.G. Johnson: "The gains from freer trade with Europe: an estimate" Manchester School 1958, pp.47-55.

(2) F. Andic, S. Andic & D. Dosser: "A Theory of Economic Integration for Developing Countries" op. cit.

(3) P. May: "Panama and the Central American Customs Union" Ph.D. (unpublished) UCLA 1965.

(4) P. Verdoorn: "A customs union for Western Europe - advantages and feasibility" World Politics, 1954, pp.482-500.

on extra-regional imports to Central America confirms figures of •4 to •6 for the price elasticity of demand for imports.(1) Time series calculations of elasticities confirm the general orders of magnitude.(2) A more recent study in Brazil gave figures of •4 for the import price elasticity.(3) However, the use of price elasticities is vulnerable to familiar criticism, notably the ceteris paribus assumption behind any calculation. Consequently, any numerical value must be subject to a wide range of error and to substantial change over time.(4)

Some indication of the doubtful validity of using tariff changes and an assumption of constant elasticities to explain trade flows is obtained by looking at the experience of Weidmaar, who tried to calculate (expost) the experience of the Central American Common Market on Guatemala's trade with the rest of Central America.(5) He tries to prove several hypotheses: one is that intra-regional trade will tend to rise most rapidly where external tariffs are highest. He divides products into "high" and "low" tariff groups (nominal tariff - greater or less than 30%) and looked at a sample of products with over $50,000 in regional trade, or at least 1% of the total. Despite testing at 3

(1) SIECA "Medidas de emergencia para la defensa de la balanza de pagos en centroamerica". SIECA/CEC - CMCA - 11/1968 DT2.

(2) T.C. Chang, "Cyclical movements in the balance of payments" Cambridge University Press 1951.

(3) P.G. Clark & D. Weisshoff: "Import Demands and Import Policies in Brazil" USAID 1961. Quoted in SIECA/CEC-CMCA II/DT2. 1968. Appendix 2 p.3.

(4) Problems involved in calculating import elasticities (and supply elasticities too) are given in a study concerned to test the advantages of a multilateral 50% tariff cut in a NAFTA arrangement. B. Balassa and Associates: "Studies in Trade Liberalisation among Industrial Countries: Objectives and Alternatives" McGraw Hill, 1967, Ch. 4 and appendices by Balassa and Kreinin. See also G. Orcutt: "Measurement of price elasticities in international trade" Review of Economics and Statistics; May 1950.

(5) D. Weidemaar: "The impact of the CACM on Guatemala's trade flows" Purdue University 1969 (unpublished Ph.D.) Microfilm.

and 7 digit level and getting partially successful results he was forced to conclude that "the import data appears to demonstrate that regional imports are being substituted for extra-regional imports, but in all pre-union tariff groups ... hence, this seems to refute the claim that the height of the pre-union tariff has restrained trade in these items relatively more than in low tariff items" ... and ... "there is little evidence that tariff height has been an important factor in the stimulation of new investment."(1) The direct calculation of price effects by elasticities, is therefore rejected.

(2) Market shares approach: another approach which does not deal explicitly with tariffs is to study the apparent effect of the common market on changes in import and export market shares looked at ex-post. In this way it is possible to contrast the value of intra-trade which might have existed in the absence of tariff elimination, assuming that the structure of world trade would be otherwise unchanged. Shares are calculated in terms of aggregate trade flows or disaggregated by commodity categories, or evaluated in terms of a matrix of trade flows representing trade between individual states. The aggregated approach was adopted in a study by Major of the EEC, who looked at changes in market shares over the 1958-61 period,(2) and Lamfalusy who contrasted shares in the EEC market over the 1960-62 period, with what they would have been in the absence of the Common Market.(3) Also a similar approach was adopted by Pearson in a study

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(1) D. Weidemaar, ibid. p.120.

(2) R.L. Major: "The Common Market: production and trade"; National Institute Economic Review, August 1962.

(3) A. Lamfalusy: "Intra-European trade and the competitive position of the EEC" Manchester Statistical Society Transactions, March 1963.

on LAFTA, where he endeavours to calculate the "integration-induced trade stimulation" when comparing the rate of increase of LAFTA intra-regional exports to that of exports to the rest of the world (with a correction for demand differences in the two markets)[1]. Attempts have been made to build on this kind of analysis recognising that it does have certain advantages, "this is .. because there is some evidence to indicate that in the absence of preferential tariff changes, shares tend to display a useful degree of constancy and partly because the use of share performance automatically normalises for changes in charges in competitiveness and income".[2]

However, this stability is not based on anything more than inertia and it is not correct to say that preferential arrangements are the only or main influence on shares: shifts in tastes and preferences, political factors, reductions in "economic distance" on certain routes, and supply flexibility are other factors. These factors can be clearly seen in share changes as they have affected Central America (Diag. 3-13). The share of Central American regional trade has been remarkably constant at 3½% in the pre-integration period; but there are major changes outside of the preference factor - the growth of the Japanese share of imports and exports, and the decline of the US share, the latter due partly to the artificially high level of trade which was the outcome of the effective blockade of Latin America in the Second World War. To apply a constant shares approach would not be very useful in this context as one of the

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(1) C. Pearson: "Evaluating integration among less developed countries: LAFTA as a case study". Journal of Common Market Studies, 1970 pp.262-275.

(2) J. Williamson and I. Bottrill "The impact of customs unions on trade in manufactures" Journal of International Economies 1972. pp.332-333.

Diagram 3-13 showing changes in market shares of Central American imports and exports.

	% share of exports					% share of imports				
	US	EEC & LFTA	Japan	Latin America	CACM	US	EEC & LFTA	Japan	Latin America	CACM
1948	80	5	0	6	5	76	5	0	3	3
9	79	5	0	4	4	75	7	0	5	3
50	79	8	0	3	3	70	10	0	6	3
51	79	7	1	4	3	68	11	1	5	3
2	76	10	0	3	3	66	15	1	4	3
3	71	15	1	3	3	64	15	2	5	3
4	66	21	2	2	3	63	18	2	4	4
5	60	24	4	2	3	62	16	2	5	3
6	55	28	5	2	4	61	18	3	5	3
7	52	33	2	3	4	58	22	4	4	3
8	51	31	6	3	5	55	22	4	5	4
9	46	30	9	3	6	51	23	5	5	6
60	49	30	6	2	7	49	24	6	4	6
1	50	26	9	1	8	47	24	7	4	8
2	47	27	11	1	8	46	23	6	5	9
3	43	26	14	1	12	46	22	7	6	10
4	37	29	12	1	16	44	21	6	6	14
5	37	23	14	1	18	41	21	8	6	15
6	34	27	10	-	21	41	22	7	5	19
7	34	26	10	-	23	41	22	8	5	21
8										
9										

Source: IMF Direction of Trade.

main effects of the Common Market trade has been to influence the overall level of imports or exports (relative to GDP) by 'gross trade creation' net regional import substitution; and the extent to which the Central American share has expanded may be attributable (in a way which is difficult to quantify) to this combination of expansion of trading in general and to diversion of supply. The retention of a 4% share in Central American exports and imports by regional trade would have led one to predict levels of regional trade of about $35m by 1968 as against $20m in 1958 before integration treaties began to be signed, and as against the actual figure of over $250m. Even if we allowed for some progress in reducing 'economic distance' outwith the framework of bilateral agreements it could not have affected the conclusion very greatly; especially when we note that the share of trade with other Latin American countries is declining (exports) or static (imports).

(3) Projection Models.

A slightly more systematic approach would be to derive a function with intra-regional trade as a dependent variable which could be used to project forward estimates of intra-regional trade in the absence of a common market arrangement on the assumption that the independent variables continue to operate in the same way and that other factors are not operating. For several reasons, this is very difficult: data is extremely fragmentary on a disaggregated basis with separate and disconnected information for 1950-52 and after 1955. Also, while the choice of an introductory date of the common market was not critical in the direct calculation of GDP effects since the impact was small over

1958-62, the choice is crucial in this exercise since the series of trilateral and bilateral treaties preceding the common market proper was already beginning to have an impact on trade flows in the 1958-62 period when the rate of increase of regional trade if not the absolute values were very large (over 20% p.a.). For example, the income elasticities of demand for regional imports calculated for 1953-61 and 1955-61 were 3.6 and 3.7; but for 1950-58 (or 1953-58) only 2.1. It is clear that any predicted values are greatly sensitive to the base date chosen. However, if we project using coefficients applicable to pre-1958 data, the "predicted" value in 1968 for regional trade would be of the order of $50m a figure substantially higher than the other estimates above based on constant shares. It is extremely difficult to be precise but it would appear that were Central America to return to a situation similar to that which preceded the Common Market, somewhere between $35m and $50m would still be traded. In fact, the figure would actually be to the higher end as the situation would not be reversible completely with regional roads now installed and business connections firmly established. Still, a very considerable amount, probably 80-95% of regional trade in 1968, could be said to be "explained" by the Common Market.

3-14

Diagram showing the composition of regional trade in the pre-Common Market period

SITC Categories 0-9	1946-51	1950	1951	1952		1955	1956	1957	1958	1960	1961
Agriculture & Raw Materials (0,1,2,4)	4.8	7.3	8.2	9.0	Food	6.2	7.0	7.9	9.8	14.4	14.9
					Crude Materials	1.7	1.8	1.8	1.5	1.6	1.6
					Veg. Oils	.5	.5	.8	.5	.7	1.6
					Drink & Cigarette	.8	.8	.8	1.3	1.7	1.1
Manufactures (5-9 incl.)	.95	.95	1.15	1.25	Chemicals	.6	.8	1.2	1.2	1.9	2.4
					Manuf. by products	1.2	1.2	1.9	2.4	3.2	6.2
					Equipment	.6	.4	.4	1.1	1.9	1.5
					Other manuf.	.8	.8	1.1	2.3	2.0	3.0
Others incl. fuels (3-9) & miscellaneous						.3	.1	.2	.1	.1	.1
TOTAL	5.9	8.3	9.7	10.3		12.7	13.4	16.1	20.2	27.5	32.4

1955-60 Estudio Economico de America Latina, 1962 (Union Pan-America)
Pre 1955 Analysis and Prospects of Intra-Central American Trade (UN, ECLA) 1955

Diagram showing the source of regional trade in the pre-common market period

	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	% Increase
Guatemala X	.26	.46	1.2	1.5	1.5	1.7	1.5	2.6	3.0	4.2	5.0	31
M	1.8	1.0	1.1	.9	1.1	1.6	1.6	1.8	2.3	3.1	7.6	150
El Salvador X	2.6	2.4	2.2	3.1	4.4	4.0	5.2	6.3	8.1	10.5	12.3	27
M	2.9	5.6	5.0	6.7	7.8	6.8	8.0	10.7	10.5	12.5	13.5	22
Honduras X	4.1	4.0	4.1	4.1	4.2	5.1	6.5	6.0	6.6	7.9	8.1	10.5
M	2.5	2.5	2.6	2.5	2.4	2.6	1.6	2.8	4.6	5.2	5.3	9.2
Nicaragua X	1.2	3.0	1.8	1.8	2.3	1.1	.7	1.2	1.4	4.2	2.0	33
M	.5	.8	1.3	1.3	2.2	1.5	1.5	2.8	2.7	4.0	2.8	42
Costa Rica X	.4	.7	1.0	.5	1.0	1.0	.9	1.5	1.8	1.8	2.4	25
M	1.0	.4	.8	.4	.5	.6	.9	.9	.9	1.0	3.9	13.5
TOTAL	8.5	10.6	10.3	11.0	13.4	13.0	14.9	17.6	20.9	28.7	30.3	14.5

Source: SIECA Notes: The "total" figure differs slightly from the above due to different methods of calculation.

The picture is very different when we look at the experience of particular countries and particular product categories (see Diag. 3-14). Guatemala, Nicaragua and Costa Rica all had negligible trade prior to the common market; Honduras and El Salvador had, however, been trading with each other at a relatively high level since the early 1950's when Honduras' regional exports were half the region's total. Clearly, therefore, these two countries had a good deal of economic intercourse which owed nothing to the existence of a free trade area in industrial goods. At a product level the level of agricultural trade was relatively high and its slow growth has not been greatly accelerated since trade was liberalised. The IED for regional trade in foodstuffs and raw materials pre-1959 is about 1, and on this basis the actual level of trade in these products in 1968 was only double what would have been predicted in the absence of integration. This has considerable implications for Honduras where over one Rolf of the regional exports were in the form of raw materials and foodstuffs in 1968; as opposed to one quater for regional trade as a whole and for the countries imports. This would imply that not only is Honduras' growth of regional exports a good deal slower than its partners, bu' that a greater proportion is also independent of common market effects.

	regional exports of non-manufactures	overall regional exports (1968)
Guatemala	$23m.	$78m.
El Salvador	$16m. (inc. fuel)	$85m.
Honduras	$18m.	$31m.
Nicaragua	$11m.	$27·5m.
Costa Rica	$9m.	$38m.

This can be seen more clearly if we look at the particulars of individual products, and predict what would be likely to occur were the common market to cease operations.

Some products would probably still be traded in the absence of a common market: (i) goods subject to intra-regional tariffs such as petroleum products; cheese, coffee and coffee extracts and cotton, where, in every case, free trade provision has not been agreed;

(ii) goods sufficiently competitive to be exported in substantial quantities on the world market such as oil seed, vegetable oil, timber, unrefined sugar and leather. Some other products are exported competitively in small quantities on the world market (copper wire, cotton yarn; machetes; certain types of cloth and insecticides) though the volumes were not significant enough to consider that these products do not depend on the preference accorded to regional producers,

(iii) there were several products traded in substantial volumes before the bilateral and multilateral integration treaties; such as drinks and live cattle. An American survey recently indicated that corn and beans (the main fresh vegetables) were traded independently of the common market.(1) In both cases intra-regional trade has risen slower than extra-regional trade, and is not much higher now (1970) than at the end of 1966 when an agreement on free trade was finally reached for grain products.

(iv) there are other products where proximity is a good deal more important than tariffs (eggs and milk) and these would probably be traded.

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(1) U.S. Department of Agriculture/Batelle Institute: "Projections of supply and demand for selected agricultural products in Central America through 1975/80" op.cit. p.37.

Inclusion or exclusion is of necessity an arbitrary process, but it was decided to assume that the following products would continue to be traded; petroleum products, oilseed and vegetable oil, cotton, live cattle, drinks, corn and vegetables (mostly beans), timber, sugar and leather. Not only is product selection arbitrary but the quantities likely to be traded are difficult to identify. Nevertheless the value of regional exports in 1968 accounted for in this way was Guatemala, $7.5m; El Salvador, $9.0m; Honduras, $12.5m; Nicaragua, $6.3m; Costa Rica, $1.5m. What is significant, is that the largest amount of trade in products which do not appear to need the Common Market is Honduras, comprising over 1/3 of its regional exports. Another interesting detail is that Guatemala and El Salvador have a small quantity of trade in these categories although their exports to the region of products in categories SITC 0-4 are higher than those of Honduras. This is because foodstuffs exports tend to have enjoyed some manufacturing processing, e.g. Honduras exports unmilled maize to Salvador and buys it back milled (at a higher than would market price). $3m of El Salvador's exports consist of rice which is protected by a substantial tariff.

On the other hand almost all the trade in textiles, chemicals, machinery, tyres, paper products appears to be attributable to the Common Market and would largely be lost if the Common Market were to cease operations, which would indicate that Salvador, Costa Rica and Guatemala have relatively more to lose from termination than Honduras and to a lesser extent Nicaragua,

To conclude, over 4/5 of regional trade could be "explained" by the Common Market and by related activities (e.g. the expansion of regional infrastructure). However, the effect is different by country and by main product category. In the extreme case, only 1/3 to ½ Honduras' exports to the region appear to depend on the Common Market.

III National Income Costs and Benefits of Continued Membership

Hitherto, we have been largely concerned with analysing the effects of trade flows retrospectively with the common market treated as, at best, a residual factor. However, we also need to confront the question as to whether, as of now, dissolution or continued membership would have the most beneficial result for the members collectively and individually, given what we know about the volume of trade which is dependent on (or independent of) the CACM.

To get an answer to this question one needs to be able to quantify the following;

(i) the extent to which increases in the value of goods traded represent a commensurate [illegible] in national income by way of local factor payments together with payment for local inputs.

(ii) "efficiency" gains or losses from "trade creation" or "trade diversion". The protection afforded by the common external tariff is clearly important here.

(iii) internal economies of scale, as manifested in new industries crossing the 'size threshold' and in reductions in cost for existing industries operating on a regional rather than a national market. However, very few major economies of scale industries have yet put in an appearance.

(iv) income gains from extra output in the form of regional exports which involve the mobilisation of unemployed resources in existing industries or new ones, provided the opportunity cost of using factors of production is less than the money paid to the factors.

(v) income losses from the contraction of existing or potential industries in the importing regional partner resulting in unemployment in that partner state.

(vi) the effects on the level of investment, and, specifically, foreign investment,

(vii) indirect effects; multipliers, leakages into overseas imports and regional imports (the latter being called "spread" effects), from any increased real income,

(viii) revenue gains and losses, seen as an element in their own right.

Domestic Value Added of Regional Exports

The value of intra-regional trade is not a value added concept and the value of trade includes imported inputs which clearly do not represent any gain to regional income. Secondly, the money value of regional trade does not take account of the opportunity cost of the factors employed in producing regionally traded goods. Both these costs, if calculable, need to be deducted from the value of regional exports to

assess the contribution to regional income.

The first point is important since, "it is, nevertheless, worth pointing out that the process of import substitution which has been taking place in the Common Market is not as extensive as figures might appear to suggest, since the manufactured products traded within the area have a high import content in the majority of cases",(1) and "if, the domestic value added content of manufactures traded increasingly within the region is low, the expansion of intra-regional trade in relation to total trade may to a certain extent be a purely statistical phenomenon resulting from the fact that exports are valued gross rather than in terms of domestic value added".(2) The second point is important since Central America is scarcely an efficiently functioning market economy in which opportunity costs will be mirrored in market prices.

The question of material inputs is quite easily dealt with. In Diag. 3-15 using industrial census data, costs are broken down into local and imported raw material inputs, fuel and power, packaging, wages and salaries and 'others'. Various simplifying assumptions are made in view of the lack of data, and Appendix 6 explains these assumptions, as well as the tables which formed the basis for the summary diagram.

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(1) Central Bank of Nicaragua (Annual Report) 1965 p. 124.

(2) S. Dell: "Obstacles to Latin American Integration" in R. Hilton op. cit. p. 63.

Diagram 3-15 Overseas "Content" of Major Industrial Sectors (%)

	El Salvador				Costa Rica				Nicaragua				Honduras			
	Foreign Inputs	Local Inputs	Wages	Residual V.A.	Foreign Imports	Local Imports	Wages	Other V.A.	Foreign Imports	Local Imports	Wages	Other V.A.	Foreign Imports	Local Imports	Wages	Other V.A.
Food Products	30	40	11	19	9	52	12	27	12.6	54.4	12.6	20.4	17	60	8	15
Drink	12	13	12	65	10	6	7	77					1	8	12	69
Tobacco	7	36	7	60	16	20	7	57					32	10	13	45
Textiles	9	60	9	32	37	12	19	32	35.3	15.8	23.8	25.1	42	5	21	32
Shoes	25	33	17	25	29	15	18	38	14.2	36.4	23.5	35.9	23	25	29	23
Clothing	16	24	19	41	53	5	13	29	35.1	26.6	19.9	18.4	44	11	18	27
Wood Products	—	—	—	—	8	34	28	30	15.2	35.5	23.6	25.1	12	38	21	29
Furniture	21	11	21	47	33	13	19	35	24.1	24.6	5.5	45.6	32	18	19	31
Paper Products	73	2	12	13	71	9	12	8	70.3	.2	14.4	15.0	90	—	4	6
Leather "	28	32	15	25	29	32	15	26	13.3	44.3	18.9	23.5	21	46	13	20
Rubber "	—	—	—	—	31	26	16	27	46.2	—	15.4	38.4	—	—	—	—
Chemicals	52	8	11	29	43	10	13	34	55.8	8.6	9.0	26.9	40	15	16	29
Petroleum Products	80	—	3	17	—	—	—	—	83.2	—	3.8	13.0	—	—	—	—
Non-metallic minerals	31	12	14	43	40	6	20	34	20.7	18.0	17.3	40.4	26	11	16	47
Metal Products	76	2	14	8	53	1	14	32					55	—	19	22
Metal Manuf.	53	15	17	15	—	—	—	—	61.5	.2	16.4	21.9	—	—	—	—
Engineering Goods (incl. electric)	50.	3	16	31	42	7	20	31					64	4	10	26.
All					39	19	15	27								

Source: See Appendix 6. Diagram A-6.

The question of opportunity costs is very much more difficult. We assume that labour costs and payments for local raw materials are costless in resource terms: i.e. we assume land and labour surplus. The rationale behind this assumption is as follows. Surplus labour on the land and in the cities is assumed on the basis of evidence about endemic urban unemployment and rural underemployment. It would not be strictly correct to assume a zero opportunity cost because certain types of skilled and managerial labour are scarce, and there is to some extent a seasonal peaking problem. Unfortunately, information on shadow prices and wages is unobtainable or meaningless, and for simplification, no opportunity cost was allowed for labour. We are treating all labour as homogenous here and this again understates the contribution which resources employed in common market exports would make elsewhere.

However, what do we do with depreciation charges, interest and profit? Depreciation charges represent the writing off, for future replacement, of the value of capital goods, imported in large part (though fixed investment includes buildings and land too).(1) Borrowed and invested capital can be raised either domestically or from overseas. One would normally regard development capital as scarce in Central America, but it does not follow from this that capital has a high opportunity cost. In fact, there is considerable evidence to suggest that as far as overseas capital is concerned if any particular investment is blocked, capital will go not into Central America but outside the area altogether. Interest and repatriated profit

(1) The "import content" of investment can be specified:

	(1) Capital goods imports / total imports		(2) Capital goods imports / Fixed Capital formation	
	1960/62	1966/68	1960/62	1966/68
Guatemala	21·9	22·2	28·1	26·0
El Salvador	17·5	20·2	29·2	32·1
Honduras	19·7	24·7	29·1	37·4
Nicaragua	19·8	25·2	29·6	40·8
Costa Rica	21·5	23·3	27·9	31·1

Source: World Economic Survey 1968/69.

(which are overseas costs) are deducted anyway in arriving at National Income (i.e. Central American value added).

Local capital is more difficult to deal with, especially investment in infrastructure and circulating bank credit. There will be a low opportunity cost only if capital is brought out of hoards or unproductive investment, and though this is not improbable in some cases, it cannot be assumed in most. Infrastructure and revolving credit certainly could have had alternative uses. As it was impossible to be more specific, local payments to capital were treated as having made a zero contribution in local national income terms i.e. the profits and interest could have been earned elsewhere, in agriculture or in non-common market based industries. Therefore in general capital payments were treated as contributing nothing to regional income in as much as they consisted either of the rewards of scarce local factors or else payments to overseas factors.

The direct contribution of regional trade to local national incomes consists of wage and salary payments, and local raw material payments.(1) These two items entail some opportunity costs and, thereby, overstate the gain, while the use of local capital may. Raise taxes otherwise unutilised and understate it. These errors are of opposite sign and while they will not cancel out completely, they offset each other.

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(1) The whole issue of analysing regional trade flows in this way is discussed in D. Segal: "East African Common Market; inequities in the 1960's: an arbitration scheme". Yale Ph.D. 1969 (Unpublished) microfilm.

The quantitative significance of these assumptions is set out below.

	% of "local Value added" in manufacturing product	% of "local value added" in regional exports (1968)
Costa Rica (1963)	34%	(approx) $12m of the $36m "explained by the CACM. + most of the remaining $1·5m
Honduras (1966)	39%	(approx) $7m of the $18·8m "explained" + almost all of the $12·5m 'unexplained'
El Salvador (1967)	40%	(approx) $29·5m of the $75m "explained" + almost all of the $9m 'unexplained'
Nicaragua (1965)	41%	(approx) $8·5m out of the $21m "explained" + almost all of the $6·5m 'unexplained'
Guatemala		$28m of the $71m "explained" + almost all of the other $7·5m.

These figures are obviously very approximate and were applied to these three digit (SITC) items of regional trade which seemed to be attributable to the existence of the common market. The general ratio of 'local' to 'foreign' costs is close to 40% in these separate estimates, with Costa Rica not greatly different. This figure is substantially less than the figure used by McClelland for local costs (2/3) though he does not deduct overseas value added.

It is interesting to note that in many of the non-traditional industries, such as chemicals, paper products, electrical and transport equipment, the local content is derisory. Many of the newer industries which figure extensively and increasingly in regional trade are little more than assembly and packaging industries which reduce real income in extreme cases. Examples of this are given in Appendix 6.

(iii) The cost of domestic production forgone: intra-regional exports contribute to national and regional income if local resources employed have a low opportunity cost. Intra-regional imports may have the two effects: first there is the trade 'diversion' or import substitution case where the importer would otherwise purchase abroad. The importer loses Rwa from higher prices.

; Second there is the case of trade 'creation' when the importer obtains goods at lower cost albeit at the expense of its own producers, who contract or go out of business. If we are consistent in our assumption of underemployed resources then this represents an income loss to the importer which is the corollory of the gain to the exporter. One can visualise a situation where trade 'creation' could lead to an all-bound income loss if a commercially inefficient producer using local raw materials and labour intensive techniques were driven out by more "efficient" regional producer using sophisticated (imported) machinery, (imported) raw materials and little labour.(1) Clearly, an economy deciding whether or not to remain in a common market would like to know whether it could, with relatively small cost on resource terms, produce goods, presently imported from its neighbours and so add to its national income. It is, perhaps, the most serious criticism of McClelland's book that he nowhere touches on this question of "shiftability" in assessing gains and losses;(2) although it was a major preoccupation of East African economists in the debate there. However, it is one thing to conceptualise "shiftability", another thing to measure it.

Brown carried out a study to identify "shiftable" industries and also potential common market based industries in East Africa which could

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(1) This is analagous to the loss of welfare which can occur when mechanised production of goods replaces local handicrafts and other small-scale 'traditional' producers within the same economy.

(2) "Shiftability" is employed here in a looser sense from that used by L. Mennes, J. Tinbergen and S. Wardenberger in "The Elements of Space Development" North-Holland 1969. There, "shiftability" is defined as that property of an industry which can be carried out at the same cost in all the space units considered.

(Continued)

not operate nationally.(1) He looked at firm sizes in Britain(2) and assuming that techniques of production were similar between countries and over time he identified "regional" and "shiftable" industries by deriving a figure for the East African market size as a proportion of that prevailing in the U.K. at the time of the Florence study, and relating it to average firm size.

Newlyn tried to avoid using overseas data by regarding as "shiftable" any industry, in an East African context, where the average output per plant (in Kenya) was less than the value of its exports to the region: in other words, regional importers could produce import substitutes, when their market size exceeded this average.(3) He implied that if tariffs were imposed on regional trade, then by withdrawing from the union, Tanzania and Uganda could (and would) develop these industries on a national basis. Thus the present importation of these goods by member states represents a 'cost' which is measured in terms of the value added of the industry. However, Newlyn's criterion and indeed the whole approach has been severely attacked.(4) The following were the main criticisms:

(i) an average firm size in country A is not the relevant measure of a shiftable industry in country B: what is relevant is the minimum firm size possible,

(ii) even if a switch to 'national' industries were technically possible it does not follow that it would be economically desirable. Considerable extra protection may be required because of diseconomies of small scale or because the new site has a comparative disadvantage, or because there are shortages of factors or raw materials in the new location. Connected with this point is another; that the extra cost of 'national' production might reduce demand and so the market size.

(1) A.J. Brown: "Customs Unions v. Economic Separatism" Yorkshire Bulletin of Economic and Social Research, May 1961. (Part 1).

P.T.O.

(2) From S. Florence: "Investment, Location and Size of Plant" Cambridge 1948.

(3) W. Newlyn: "Gains and losses in the East Africa Common Market" Yorkshire Bulletin of Economic and Social Research, November 1965 and "Reply" to previous criticisms in November 1966.

(4) A. Hazelwood: "Shiftability of industry and the measurement of gains and losses in the East African Common Market" Bulletin of the Oxford Institute of Economics and Statistics May 1966. P. Robson: "Economic Integration in Africa" op. cit. pp.138-144.

(iii) the alternative possibility is not only that of national and autarchic policies; other preferential groupings need to be considered,(1)

(iv) some industries are neither "shiftable", nor necessarily based on the common market; they may depend on a specific resource endowment in a particular country.

(v) Newlyn's own analysis is weakened by the high level of aggregation of categories chosen and Hazelwood was able to show on the basis of more detailed and accurate data that Newlyn's classification was either meaningless or incorrect in most instances.

(vi) Newlyn measured the income gain in terms of value added which assumes an absence of opportunity costs and that all factors are local.

Though the concept of shiftability is clearly an important one, it so far evades satisfactory quantification.

In the short-term one can safely assume that were the CACM to terminate, most purchases would be deflected outside the customs union i.e. little of the present regional trade could be met by national "shiftable" production. We have already outlined the conceptual and practical problems involved in handling this phenomenon though it clearly cannot be ignored entirely, and the rupture of the common market would undoubtedly be followed after a lag by import substitution on a national basis. By way of illustration a rough checklist of "shiftable" industries was drawn up, on the basis of El Salvadorian figures. If the regional imports to a country were greater in value than the average firm size in El Salvador in 1967 than we assumed that that country would be able to

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(1) In Central America precisely this kind of re-orientation has occurred after 1970.

produce it nationally without encountering scale problems.(1) However, the list was undoubtedly a gross overstatement of the extent to which local production could replace regionally traded products in the short run: in some "shiftable" industries there is a good deal of intra-product specialisation which would make a switch to a national market difficult, especially with branded products such as perfumes, cosmetics, pharmaceuticals, but also with products such as clothing. In other cases the size of demand criterion masks supply problems which would be entailed in producing local raw material-based commodities such as furniture, timber products, jam, and animal food. In yet other cases technically "non-shiftable" products could and probably would be produced locally if local establishments existed: soap, machetes, matches, margarine, paint, animal foods are all products which are actually produced in most of the five countries and whose production could be expanded. The results were so obviously in conflict with common sense that they were ignored for purposes of serious analysis.

Evidence from the experience of Honduras' one year of temporary withdrawal from the CACM is that very little regionally imported trade indeed has been "shifted" to domestic firms.(2) "Shiftability", it would appear, is at most a short-term factor, probably on a modest scale. In order to apply a simple rule of thumb we assume in a secondary calculation that the countries importing clothes, shoes and cotton textiles could produce most of these goods, if little else, nationally, at least within a period of several years. To these one could probably add some of the miscellaneous manufactures such as plastic goods, matches etc., some simple mixed chemicals (soaps, detergents etc.) and some of the foodstuffs. However,

(1) "Shiftable" products were; clothes, perfumes and cosmetics; shoes, cotton textiles, cardboard boxes, furniture, wood products, printing, fruit and vegetable processing, leather, pharmaceuticals.
Those where there was a large discrepancy between the size threshhold and the 'market' indicates possible 'regionally based' industries — e.g. glass bulbs, chemical products, machetes, tyres, jute sacks, rayon & synthetic fibres, fertilisers, iron and steel products; soap, matches, margarine, paint and animal foods.

(2) Economist Intelligence Unit; Central American Report No. 2 1971. p.15.

such a grossly unscientific exercise is of its nature arbitrary and we shall simply assume that the three large categories of "traditional" manufactures are the object of domestic import substitution if the regional market was to break up. The "gain" from withdrawal in respect of the sectors would be Guatemala $4·5m, El Salvador $4·5m, Honduras $5m, Bicaragua $3m and Costa Rica $2·75m. In the case of Honduras this goes a considerable way towards eliminating any income gain from the Common Market and to a lesser extent for Nicaragua, but the influence is relatively small in the other three cases.

(iv) 'Common Market' based industries

We need also to consider industries which are completely dependent on the regional market, such that they would be forced to close if the Common Market were to break down. Technically, only the two integration industries (tyres and caustic soda/insecticides) and possibly one or two "special" industries (copper wire, sulphuric acid, etc.) fall into this category, but it seems not unreasonable to assume in practice that governments would protect these plants in order to keep them in existence, based on national markets or else on alternative trade outlets. Another possibility is that a country may see advantages from future membership if it can be guaranteed important 'regional' industry. It could be argued that Honduras might take into account the possible development of a pulp and paper complex which would necessitate access to the regional market. However, even if this factor were quantifyable, which it is not, the fact is that a common market is neither a necessary nor a sufficient condition for the development of regionally based industry: a sectoral regional investment policy is more relevant and such a policy is not operational in Central America.

(v) 'Secondary' or Spillover Effects: So far only the direct contribution of regional trade only has been considered. However, the local factor payments are spent: some leaking into imports, others stimulating demand for local products. It could be argued that some form of multiplier is at work here and the subsequent multiplication of incomes should be allowed for. Attempts have been made to study the effect of 'common market' generated activity on the overall level of demand, for example Brown, who tried to estimate "spread" or "spillover" effects in East Africa.(1) His study is essentially a Keynesian multiplier analysis with leakages into overseas imports and savings. Using plausible guesses as to the magnitives of parameters (e.g. for the marginal propensity to import from partner states) he calculated the effect of a change in income in country A or country B, and tried to show that Kenya and Tanzania would, in fact, benefit from the union because of "spread" effects.

In an unpublished thesis Charteris built up a demand model for East Africa which purported to show how the spread effect of demand from industrial incomes coupled with the effects (direct and indirect) of the redistributive pool resulted in losses to Kenya and gains to the other states.(2)

However, Keynesian multiplier analysis was not evolved in economic conditions where some factors of production are scarce as in East Africa or Central America: it assumes a high supply elasticity and that demand is the main constraint.(3) In practice, this cannot be assumed and the

(1) A.J. Brown: "Economic separatism versus a customs union in developing countries". Yorkshire Bulletin of Economic and Social Research, Nov. 1961 (Part II)

(2) R. Charkins: "The Theory of Integration in a Developed Setting - of East Africa" PRS. (University of Carolina) 1970. (Microfilm)

(3) E.G. Rao: "Investment and the Multiplier in an Underdeveloped Economy" Indian Economic Review, Feb. 1962 pp.55-67.

concept of 'multiplier' has to be used with a good deal of care in this context. Moreover, it is possible to argue that the multiplication of incomes deriving from increased exports is different in character from that which would flow from - say - a budget deficit, or a stimulus to consumption and investment, in an underemployed advanced industrial economy.(1) In an advanced depressed industrial country, capital as well as labour is underutilised and unless there is a serious crisis of confidence, an increase in aggregate demand would be followed nearly automatically by a rise in aggregate supply. In a 'developing' economy capital may well not be underutilised or, if it is, this may be due as much to supply factors (management, skilled labour) as to demand factors and so Keynesian measures would in all probability not work, but result in inflation and foreign exchange problems. An expansion of exports, however, taking place autonomously has the effect of increasing output simultaneously with demand (and as production is in the form of tradeable goods, offsetting the increased expenditure on foreign exchange). Thus it is more legitimate to talk about a multiplier in real income terms. Most writers in this field have used the multiplier concept though few have acknowledged the problems involved and a series of estimates is set out in Diag. 3-16. In most of the estimates quoted, the multiplier effect is very large and swamps the other effects which we have been discussing.(2)

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(1) D. McClelland: "The Central American Common Market" op. cit. p.211.

(2) These multiplier effects are primarily of importance in the domestic economy of the regional exporter (or negative to the importer where "shiftability" is being considered). Spillover effects to the other partner states are relatively minor by comparison.

Diag.3-16 showing various estimates made of the income multiplier in developing countries

(1) Miscellaneous estimates from developing countries.(1)

	Peru	Argentine	U.S.A.
Agriculture	1.2	1.3	1.7
Manufacturing	3.6	3.0	2.5
Traditional	(4.9)	(4.9)	(3.3)
Non-Traditional	(2.4)	(2.0)	(2.3)
Others	-	1.2	1.3

(2)) National Plan of Guatemala(2)

Central Government Expenditure	
Consumption	2.72
Investment	1.28
Exports	3.58 (plus .45 after a year lag.

(3) McClelland(3)

Central America: overall figure of .9

(4) Central American Agricultural Supply and Demand Projections (U.S. Dept. of Agriculture). (4)

Overall Figure:	1960-70	1970-75	1975-78
Guatemala	2.5	2.8	3.2
El Salvador	3.5	3.8	4.3
Honduras	2.5	2.7	2.9
Nicaragua	2.0	2.5	3.0
Costa Rica	2.5	2.8	3.3

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(1) Figures from Hector Soza Valderama "Planificacion del Desarrollo Industrial" Mexico 1966, p.47.

(2) National Plan of Guatemala:1969-74: based on estimates of the University of Iowa (USA).

(3) McClelland op.cit.

(4) U.S. Department of Agriculture/Batelle Institute: "Projections of Supply and Demand for Selected Agricultural Products in Central America through 1975" op.cit.

N.B. In two East African studies already referred to Charkins assumes a multiplier of 3 in Uganda, 2 in Kenya.

(vi) The Cost of Protection of Regionally Traded Goods

The first step in this inevitably unsatisfactory calculation is to assess the common external tariffs which common market goods carry. Let us assume for the moment that all trade is "diverted" and thus that the "cost" of protection by the customs union common tariff is quite simply the value of intra-regional imports multiplied by the difference in cost between domestic production and imports. This is the cost paid by the importer for the cost of an infant industry establishment in the exporting country. In calculating this cost it has been assumed that the difference between domestic prices and import prices (cif) is measured by the nominal rate of common external tariff.(1) This assumption is obviously the only one compatible with conventional price theory where two identical goods cannot sell at different prices in the same market.

If we applied this type of analysis to Central America we could establish the "cost" of the tariff protection, If we assume that all regional trade would be "diverted" outside the region if the market broke up, which it would be in the short run, we can get a maximum figure for the cost of the tariff. A recent ECLA study showed that the average height of nominal tariffs was substantial: consumer goods, 82·5%; raw materials and intermediate goods, 34·5%· building materials, 32% and capital goods, 13%,(2) and changing the basis of weighting did not seem to greatly affect these general averages.

Bearing in mind the assumptions made so far, if we multiply the value of trade in each category by the nominal tariff rate then this

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(1) It is very important to point out that we are using the national tariff as a proxy for the cost of protection. Nominal rates may of course have other more direct uses, as measures of the restrictive effects on trade flows or fiscal effects.

(2) U.N. (E.C.L.A.): "General situation and future outlook of the Central American Integration Programme" E/CN/12/CCE/265, Feb. 1963.

Diagram 3.17 Regional Imports from the Common Market Countries by Economic Groups in $m.

Volume of Imports from the region	1966 Guatemala	El Salvador	Honduras	Nicaragua	C. Rica	1968 Guat.	El.Sal.	Hond.	Nic.	C. Rica
Consumer goods	16.35	31.1	22.11	18.74	14.15	16.85	34.72	26.45	25-74	25.86
Raw Materials + Intermediate goods	15.09	14.73	8.42	7.98	7.41	21.5	22.7	17.8	15.0	19.0
Building Materials	.86	5.08	1.63	2.57	.67	3.52	6.23	2.71	3.71	2.61
Capital Goods	1.08	.91	1.25	1.83	.89	1.32	1.53	1.71	1.66	1.27
TOTAL	$ 33.84	52.03	32.47	31.49	24.09	43.14*	65.16	48.67	46.17	48.85
Ratio of import volume to that of the country with the lowest volume of imports	1.40	2.16	1.35	1.31	1	*Corrected Figure is /49.4/ 1.07	1.41	1.05	1	1.06
Cost of Tariff Protection of Regional Import (i.e. average tariff x volume of imports)										
TOTAL	$ 20.26	33.7	22.7	20.1	15.18	28.1	40.8	30.16	28.95	30.0
Ratio of tariff cost to that of the country with the lowest cost.	1.33	2.12	1.49	1.32	1	.98	1.41	1.04	1	1.04

NOTES 1. The average nominal tariff rates are taken from the ECLA study referred to in the text.

could give us the "cost" in income terms of paying the tariff: it amounts to about 60% of the value of regional trade (imports) in 1966 and 1968 for the five countries separately and collectively. There is not only a globally large economic cost of protection but represents a 'terms of trade' movement against Honduras and particularly in favour of Guatemala, i.e. Guatemala imported from the region disproportionately large quantities of low tariff raw materials and intermediate products from its partners while Honduras imports a disproportionately large volume of high tariff consumer goods. An attempt is made to demonstrate this in Diag. 3-17, where on the assumption of 100% trade diversion and 100% tariff utilisation, it can be shown that the cost of the tariff is higher (proportionately) for Honduras.

The conclusions of this study are, on the surface, extremely disturbing. If we ignore second-round effects, the 'costs' of external tariff protection are considerably higher than the benefits of integration as they have been calculated so far. One explanation could be that some trade would not be "diverted": however, even those industries which historically appear to have experienced "competitive" trade creation might take a considerable time to adjust to national production of former imports after the dissolution of the regional group and as we have already indicated the potential "shifting" of industry does not seem a quantitatively large factor at least in the short run. Imposition of tariffs might also have consumption effects, in reducing demand.

However, there is another much more important factor, and this lies in the fact that nominal tariffs are a technically unsatisfactory measure of protection. Viner has argued "that there is no way in which the 'height' of a tariff as an index of its restrictive effect can even be approximately measured, or for that matter, even defined with any degree of precision."(1)

(1) J. Viner: "Customs Unions Issue" op. cit. pp.66-67.

The nominal measure simply takes the tariff (in ad valorum terms) as a % of cif import values. This measure assumes that nominal tariffs are indeed a fair measure of the difference between local and import prices. However, there is a good reason to suspect "water" in the tariff, i.e. part of the tariff is redundant in as much as local producers are able to sell at prices significantly below the price of imports (cif) plus tariff. Various writers on tariff matters have drawn attention to this phenomenon(1) and a recent study on Mexican tariff rates indicated that more often than not the tariff was not used (in other cases, though, the tariff understated protection because of the existence of quotas).(2)

East African evidence confirms the existence of disparities of this kind. One important study which assumed "no water", was that of Ghai:"there are reasons to believe that this is a close approximation to the effective protection enjoyed by East African produce and manufactures.... A cursory examination of prices (excluding import duty) of a few imported agricultural and manufactured products with the prices of similar domestic products shows that import duties are a reasonably good measure of the actual protection by local products. Also with the exception of products in which there are quantity restrictions, East African imports most of the products entering inter-territorial trade. In a situation like this, it is reasonable to assume that imported goods act as 'pace-setters' and that local producers will be faced with given prices for their products. It would, therefore, appear we are justified in using import duties as a measure of the cost of import substitution stimulated by the common market".(3)

In Hazelwood's critique of Ghai's article he identifies categories of goods, regionally traded, which do not use their protective tariff:

(i) goods where there can be no effective competition from outside because transport costs or perishability are so important, as with fresh milk.

Footnotes on p.162.

(ii) goods which are sold at prices below "import parity" (e.g. beer & cigarettes) or successfully exported outside East Africa.(4) He was, in turn attacked when he used this information to argue that substantial elements of "protected" East African regional trade was, in fact, independent of the external tariff and to such an extent that Kenya's 'advantage' in regional trade disappeared. Wood has argued that this is too much of an 'all or nothing' approach and that tariffs do approximate to the need for protection if only partially: also that increases in tariffs on entry to a regional group may be significant even if the

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(1) B. Balassa: "Trade Liberalisation in Industrialised Countries" John Hopkins 1967. pp. 60-62,
and "The Structure of Protection in Developing Countries" op. cit. pp.11-14.

(2) T. King: "Mexico: Industrialisation and Trade Policies since 1940" OECD, 1970, especially the Appendix in which G. Bueno's estimates are discussed. Also considerable disparities were observed by S. Lewis & S. Guisinger of "Measuring Protection in a developing country: the case of Pakistan" Journal of Political Economy Nov/Dec. 1968 pp.1670-98.

(3) D. Ghai: "Territorial distribution of benefits and costs of the East African Common Market" East African Economic Review June 1964. Ghai's study is primarily concerned with establishing the cost of trade "diversion", and the extent to which the imports of one country in intra-regional trade tend to be more heavily protected than those of the partner states. He showed that Kenya's intraregional exports need to be more highly protected as well as being greater in quantity than those of Uganda and Tanzania.

(4) A. Hazelwood: "The East African Common Market: importance and effects" Bulletin of the Oxford Institute of Economica and Statistics, Feb. 1966.

absolute level is less so.(1) However, a recent study of Roe's appeared to indicate that underutilisation of tariffs is very substantial across the board: "the weighted average of effective protection on the 34 products for which comparison was possible worked out at only 7·2% .... or about 1/10 of the nominal protection".(2) In Appendix 4, this is illustrated for Central America and Diagram 3-18 shows the major discrepancy between nominal and 'implicit' tariffs.

However, such a conclusion seems to conflict directly with price theory under which the same goods cannot sell at different prices in the same market. There may be divergences where statutory marketing boards fix prices, but otherwise apart from temporary disequilibria, this anomaly could be explained in several ways.

In some cases, as with perishable goods or traditional export goods there may be only a 'trickle of imports from outside the area, and the tariff is merely redundant remaining, perhaps, as an anti-dumping device. There are other industries where infant industries have "grown-up" and have developed a highly price-competitive industrial structure. Imports no longer enter and the tariff remains performing no function. The market structure of domestic production will determine the price whether it is a competitive equilibrium or a monopolist/oligopolist profit maximising price. Where tariffs are prohibitive the nominal rate of

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(1) R. Wood: "The East African Common Market: a reassessment" Bulletin of the Oxford Institute of Economics and Statistics, November 1966.

(2) A. Roe: "Terms of trade and transfer effects in the East African Common Market" Bulletin of the Oxford Institute of Economics and Statistics, August, 1969, pp.160-161. The sense in which 'effective' protection is used by him is quite different from that used by Balassa, Corden etc. and is equivalent to the term "implicit" protection used elsewhere.

Diagram showing various aspects of nominal and implicit protection

PERCENTAGES

	A Nominal Tariff (1966)	B Rank order of A	C Implicit Tariff (1966)	D Rank order of B	E Implicit Tariff (modified)	F Price Change since 1962
A Finished Manufactures for consumption						
Clothes (all)	90	15	-40	34	+1	-8
Perfumes, household soap, cosmetics	90	15	-30	28	+15	+5
Shoes	150	3	-40	34		-8
Cotton Cloth	70	3	-12	18	4-5	-26
Misc. manufactures	87½	15	-20	23	30	-20
Blankets, Rugs, Towels	105	9	+11	10	55	15
Rayon goods	100	10	-3	16	15	-10
Medicines	10	39	-50	37	-35	25
Furniture	160	10	-25	25	140	
Printing material	100	10	7	12	0	0
Gramophone records	75	20	-45	19	-30	-10
Weighted average by importance in inter-regional trade	83		-20			-8
Arithmetic average	85					
B Manufactures (finished and unfinished) for industrial consumption (including agriculture)						
Industrial soaps	82		-20		20	50
Electrical apparatus	30	32	15	9	85	75
Chemicals products (a) insecticides	20	37	-10	17	-10	-15
(b) plastic material, cellophane	55	23	32	5	110	-15
Paper product (cardboard, wrapping paper)	45	27	-33	30	0	-10
Metal manufactures (machets, nails, etc.)	37.5	30	10	11	65	-
Tyres	30-40	29	33	3	100	30
Jute bags	50	24	20	8	60	20
Steel pieces	28	33	33	3	75	-25
Copper wire	20	35	1.5	13	30	0
Cotton yarn and thread	17.5	36	-40	34	-50	-3
Fertilisers	5	40	25	6	50	27
Paints	42.5	28	-2.5	15	35	-5
Tanned leather	45	27	-15	19	-15	0
Paper-kraft	50	24	40	2	45	0
Mining and construction machinery	*5*	*40*	*-50*	*37*	-	*-35*

	A	B	C	D	E	F
lass bottles	22	24	60	1	70	50
luminium products, zinc	35	31	-20	23	-30	-20
Weighted average	34		+3			+7
Arithmetic average	28.5					
. Food						
resh vegetables	100	10	-65	42		-4
eg. Oils	56	22	-25	25	-25	0
nmilled maize	110	7	0	14	15	3
resh Fruit	110	7	-50	37	-80	-20
largarine	117	5	-39	33	-3	-8
weets	100	10	-50	37	-10	+8
isc. food	87	19	-35	31	-25	-45
ruit preserves	120	6	-30	28	-30	-10
nimal food	11.5	38	-40	36	-10	-8
ereals	35	31	-25	25	-25	10
aize	75	20	-15	9	10	-
Weighted average	92		-33			-4
Arithmetic average	81					

Notes.

A/ = Nominal Tariff Rate (1966 data)...

B/ = Rank order of nominal tariffs for whole sample

C/ = Ave. price (cif) of inputs from Central American countries relative to ave. price (cif) from outside world. This was done by giving the Central American prices the index number 100 and relating world prices to this index.

D/ = Rank order of price relationship

E/ = As C but taking price from lowest world source.

F/ = Ave. prive of Central American intraregional imports (cif) in 1966 relative to ave. price in 1962.

N.T. AVE. refers to products where there is no common tariff - an arithmetic ave. is taken.

Sources See Appendix 4.

protection indicates the "potential" protection, which gives a "cushion" to the producer. In this case, one must make direct price comparisons in order to assess the importance of the tariff for questions of resource allocation.

There are cases of substantial "water" in a tariff even when a considerable proportion of imports comes from outside the region. This can be due to quality differences; and to 'import preference' amongst local consumers even when there is no objective quality difference, caused in part, by major social and income inequalities which are reflected in different tastes; or due to expatriate ownership of retailing and wholesaling outlets.(1) There is evidence that even in making applications in Central America, producers ask for a 30-40% 'safety margin' between their own prices and competing import prices.(2)

This raises difficult questions of principle and practice. It is usually not possible to use the trade classification to separate high/low quality goods and it would be easy to regard (for non-prohibitive tariffs) any loss of quality as equivalent to monetary loss as measured by tariff differentials. However, this would be inappropriate in the context in which we are dealing. What appears to be happening is that import substitution tends to take place in lower priced lines because the local market is deeper and because the effects of a "specific" import duty on a broad category of goods is to make the protection on the cheapest goods higher. As a result the availability of cheaper goods is increased,

(1) United Nations E.C.L.A. "Evaluacion de la integracion economica en Centroamerica" Mexico, 1966, pp.38-40.

(2) S.I.E.C.A.: "Solicitudes de los Gobiernos para renegociar gravamenes a la importacion equiparados" SIECA/CE-XXIII/OTS, 1966.

perhaps giving access to categories of the population which previously were able to consume only small quantities; while the higher quality goods are in more restricted supply. The process is well described by the management of one of Central America's paint firms: "when INCEP - (a Californian (US) subsidiary) started to manufacture it concentrated on the same line of premium products as previously sold in the area on an import basis ... However, these premium quality paints were still out of reach for the great majority of Central Americans. This was brought home by the success of local firms with cheap liquid and powdered paints ... Thus INCEP broadened its line ... and as the Californian Paint Co. sold only high quality paints, the formulae for the new lines was provided by the company's Cuban affiliate." (1)

We are wandering into the more elusive realms of welfare economics, but it is far from obvious that an enforced switch (at the expense of elite groups largely) from high to low cost lines of consumer goods, or to penalise an "irrational" import preference, should be considered a cost to be equaled with the direct cost of trade 'diversion' as conventionally understood. It is clear that for most consumer goods, prior to import substitution, the importers buy overseas products in a manner which reflects not only the inegaliterian social structure but the branding and product differentiation strategies of the metropolitan exporters. However, when local production commences, it becomes a commercial imperative for the company and an economic boon to the country

more

(1) Harvard Business School: "Industria Centro-americana de pinturas - INCEP" Industry Case Study, Boston U.S.A. 1968.

if producers adapt their output to a 'mass production' basis aimed at the larger untapped home market. The "loss of quality" is unimportant in this context.(1)

It would appear then that there is not a great deal of significance in the levels of the nominal tariff. What about changes in the level? It is not too difficult to show that the effect of tariff harmonisation was to revise tariffs upward (2) and this would appear to have adverse consequences for the previous low tariff countries, Honduras and El Salvador.(3)

A World Bank study of external tariffs (4) showed that out of a sample of 87 items of products, which bulked large in intra-regional trade, the external tariff was greater than the pre-integration national tariff in 82 items (Honduras), 79 (El Salvador), 76 (Nicaragua), 73 (Costa Rica);

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(1) However this kind of beneficial structural change is not universal. Many import substitution industries incorporate the quality and product differentiation patterns of the metropolitan manufacturer (assembler) and use a protective tariff to do so.

(2) See Appendix 4.

(3) J. Nugent: "La structura affancelaria y el costo de protection en America Central" El Trimestre Economico No. 140 Oct.-Dec. 1968, pp.751-766. Note that the discriminatory nature of customs unions can result in significant changes within the average. For example, if Honduras had a tariff of 10% and Guatemala of 30%, a new (higher) average tariff of 25% were imposed the tariff would be decreasing for Guatemala. J. Flanders: "Measuring protection and predicting trade diversion" Journal of Political Economy, 1965, pp.165-169.

(4) World Bank Report op. cit. Vol. II (Statistical Appendix) Table 35.

a very crude indicator but one which indicates that not only has Honduras suffered proportionately more trade diversion, as it was hitherto a relatively low tariff country.(1)

However, the appendix exercises also show that while attempts have been made to raise the rates upwards, the actual tariff has fallen in many cases because of the effect of rising import prices (due to inflation in developed countries and a shift to higher quality lines in extra-regional purchases) on specific tariffs. If we look at actual prices (implicit rates) rather than nominal rates the irrelevance of the upward movement of tariff rates is even more apparent. My own and McClelland's data indicate that upward shifts are of negligible importance. In both cases a direct comparison was made of cif prices of goods traded intra-regionally in 1962, and at a later period 1966 (or 1968). The comparison was made at a seven digit or more level of disaggregation and so only a small amount of any change in prices could be attributable to changes in commodity composition within the categories, though the categories are still far from homogeneous. McClelland found that between 1962-66, 44% of the items had lower prices, 17% were the same, 13% had prices less than 10% higher and the remaining 26% had substantial increases. A correction for product mix differences made little difference.(2) The author made a similar comparison and the results are summarised in column F of Diagram 3-18, where the figures are given in large product categories

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(1) S.I.E.C.A.: "Exposicion de Honduras sobre los Problemas Actuales del Mercado Comun Centro-americano y Propuesta de un Plan de Accion Immediata", Guatemala, 1969.

(2) D. McClelland: "The Central American Common Market" op. cit. pp.59-62.

representing a weighted average of sub-products. My own figures show that (for a weighted average) consumer goods fall in price over 1962-66 (and 1962-68) by 8% and so did foodstuffs (by 4%): intermediate goods rose slightly (by 7%). Such price increases as did occur were in a few products only, but nevertheless, of important items; eletrical equipment such as wires, cables, batteries, bulbs; cardboard boxes, steel sheets and metal containers and tanks of various kinds, machetes, blankets, rugs and jute sacks, fertiliser, medicines and plastic domestic goods.

This is not to say that all participants benefitted equally from this tendency to have lower prices under the influence of greater competition. Not only is there the evidence which indicates that Honduras has had adverse "terms of trade" in intra-regional trade, as an exporter of agricultural produce and an importer of regional manufactures, but it is alleged by Honduras that whereas "trade creating" competition has lowered prices in many of the more traditional manufactures, Salvadorian and Guatemalan suppliers have taken advantage of the protected Honduras market, where there is little competition from domestic producers, to raise prices. The following price indices appear to bear that out:

		1960	1968	(1963 = 100)
San Salvador	All goods	101	105	
	Food	97	109	
	Housing	128	110	
	Clothes & Shoes	95	86	
Tegucigalpa (Honduras)	All goods	94·5	112	
	Food	92	112	
	Clothes & Shoes	93	155	
		95	134	
	Housing	98	108	

Source: Date from "Indices de precios de la consumidor de las Nationes Americanas" Bulletin No. 43, Union Panamericana, 1969.

Though one cannot generalise, it is fairly clear that in the major category of manufactures in which El Salvador and Honduras deal, (i.e. clothes and shoes) Honduras, as a partial consequence of switching from non-Central American to Central American sources, has experienced some considerable price inflation in these goods. El Salvadorian consumers on the contrary have experienced a fall in prices. This phenomenon can only be explained either by price discrimination caused by different degrees ofcompetition in different markets, or else by the fact that market enlargement has caused a considerable fall in El Salvadorian prices from well above world market level: the former explanation appears to fit the facts better.

The general effect, therefore, of high nominal tariff levels and of increases in the rates does not seem significant when we look at prices directly. It certainly does not seem meaningful to talk about the cost of the external tariff in terms of a substantial % of GNP.(1) Nevertheless, there are some products which in terms of "implicit" protection are clearly enjoying most or all of the benefits of the tariff, and there is clearly a cost in terms of economic resources. This is measured better by 'effective' than 'nominal 'protection'.(2)

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(1) E.g. the Nugent tariff study referred to earlier argued that the common tariff "cost" Central America 2% of its GNP. R. Nugent: "La estructura arancelaria etc." op.cit. This figure is similar to that estimated by a similar method by Harberger for Chile. This is the "static" cost of protection. Attempts have been made to calculate "dynamic" costs as well which would embrace the effect of free trade on inducing greater competitiveness, and the efficiency gains from the closure of inefficient firms: i.e. the competitive "shock" or "cold shower" sometimes referred to in a European context. However this whole exercise presumes mobile resources and it is very doubtful if the Central American economies have that kind of flexibility, or indeed, if it is enjoyed by other Latin American economies (Balassa considered the total cost of protection was 6.2% of GNP in Chile and 9.5% in Brazil). A. Harberger: "Using the resources at hand more effectively" American Economic Review, Papers and Proceedings, May, 1958, pp.134-155. B. Balassa: "The Structure of Protection in Developing Countries" John Hopkins Press, 1971, Ch. 4.

(2) See Appendix 4.

This is not a thesis about protection measures. However the basic common sense behind the idea of effective protection is that it measures protection of the manufacturing process not of ex-factory values.(1)

Using the values of nominal tariffs already calculated, it should be possible to make some kind of estimate of 'effective' protection. To carry out measurement in practice, however, is complicated by the fact that measurement of effective like nominal protection is dependent on what assumption one makes regarding the extent to which the tariff is used. Also, there is no input/output data in Central America worthy of the name at a satisfactory level of disaggregation to establish the value added and raw material coefficients; one has the choice of using input-output coefficients derived elsewhere or the very partial data available from census information.(2) Another problem is that on many imported inputs, but not all, duty is exempted under industrial incentive legislation. One study shows that in many sectors, tariff exemption is almost complete (cardboard and paper products, basis chemicals and miscellaneous chemicals, basic iron and steel, metal products, electrical equipment, miscellaneous manufactures (plastics), synthetic textiles, clothes, jute bags). In these cases effective protection tends simply to the protection of value added.

Diagram 3-19 shows some results for a sample of products for which tariff protection appeared to be important. One can see that in some cases effective protection, even if considered in terms of "implicit" protection, is close to or greater than 100%. This is extremely costly. It implies that despite lower labour costs, the cost of processing is twice as great as at internationally competitive prices. In some cases, also, there is actually a net loss in foreign exchange (where domestic

(1) If tariffs on raw materials are zero then the measure of effective protection quite simply measures the extent to which processing costs (wages, profits, rents and by some measures, local raw material costs) can exceed the processing costs of foreign competitors. If raw material imports are taxed, however, then part of the nominal tariff is performing no protective function

(1 cont.)
other than covering the tariff on the input and this reduces the effective protection. Taking these two factors together, the effective protection is a function of the differential between the tariffs on raw materials and tariffs on the final product, combined with the extent to which the cost of the finished product is accounted for by these raw materials.

(2) This was used in fact.

Nominal and Effective Protection for Goods which appear to use the C.E.T.

	Product	Value of Regional Trade. (1966)	Nominal Rate A	Implicit Rate (1966) B	Value Added Ratio (approx) El Salvador (1968)	Effective Prot. A	Effective Prot. B
561-01-00 02-00	Fertilisers	$3.0m	5%	25%	.3	16%	68%
561-09-00	Celophane	$ .42m	29%	60%		66%	170%
599-01-01) 04)	Plastic Material		(est.70%)	-	(circa .35)	(117%)	
653-05-02	Textile Fabrics (rayon goods)	$4.7m	100% (increased to 70%)	-	.4	(125%)	
721-02-01	Baltenes	$2.35m	30-40%	10%	.4	69%	23%
721-03-01	Bulbo	$ .35m	130% El Salvador approx.	20%+	.5	(130% circa)	33%
721-03-00	Cables & Copper Wire	$1.6m	25%	20%	.5	40%	33%
641-02-01	Paper & Writing Paper	$ .3m	45%	15%	.3	105%	43%
	Kraft	$ .35m		66%	.3		130%
629-0102	Tyres	$4.8m	70%	33%	.5	83%	50%
665-01-01	Glass Bottles	$ .27m	22%	66%	.5	35%	80%
681-04-08	Steel pieces	$1.33m	17%	8%	.4	34%	19%
681-67-02	Steel sheets	$1.83m	40%	60%	.4	70%	94%
699-02-01	Machetes	$ .8m	8%	100%	.5	15%	(100%)
699-21-03	Metal Tanks	$ .3m	16%	10%	.5	25%	18%
899-63-02	Umbrella Parts	$ .27m	31% (inc. to 90%)	80%	.7	35%	(80%)
655-01-02	Jute sacks	$1.7m	Circa 100% in El Salvador	20%	.33	(100%)	58%

We assume that $\sum t_{ij} a_{ij}$ is zero since imports are generally duty free

Notes

Sources : Value added ratios from El Salvador "Annuario Estadistico" 1968; tariffs from worksheets in the appendix or from "Special industry" studies of SIECA.

value added at world prices is zero).

This tendency of some industries to become very highly protected may not have quantitatively significant consequences overall, though many of these industries are of strategic importance in the economy as producers of intermediate goods to other industries and agriculture. Steel products and electrical apparatus impose additional costs on the construction industry, while agricultural exporters suffer particularly badly from high cost jute bags, fertilisers, kraft packing papers, machetes, tractors and agricultural implements. Insecticides, have, undoubtedly, become more expensive since the Nicaraguan toxaphene plant started production.

To come to general conclusion; it would appear that there are some products where "static" costs of protection are significant but relatively few. Trade diversion does not appear to involve quantifyable cost that can be set alongside the gains from stimulated activity and, indeed, there are offsetting gains from industries where genuine competitive trade creation is involved. We feel, therefore, entitled to ignore these costs when calculating gains and losses, while noting that in as much as there are costs involved, they appear to bear down more heavily on Honduras.

Summarising National Gains and Losses

If we take the various elements already isolated and try to combine them, one could produce some kind of global estimate for gains and losses of remaining or withdrawing as of now (1968).

It has been argued that the cost of protection is sufficiently small to be ignored. Therefore, there are only a few steps in the calculation.(1)

(1) A similar type of balance sheet is drawn up in R. Green: "Economic Union in East Africa: Principles, Prices & Proceeds" East Africa Institute of Social Research Conference Papers, Jan. 1966, Paper No. 553.

Cost in $m.	G.	El. Sal.	H.	Nic.	C.R.
(1) Total regional exports in 1968:	78	85	31	28	38
(2) Total "explained" by Common Market:	70	74	19	22	36
(3) After disallowance of 'non-local' costs:	28	29	7	9	12
(4) "Shiftable" regional imports ... after disallowance of 'non-local' costs:	-5	-5	-6	-3	-3
Net gain:	23	24	1	6	9
(5) Multiplier ... (a) if 1 (minimum)	46	48	2	12	18
(b) if 2 (maximum)	69	72	3	18	27
As a % of GNP this works out at	[3% to 4%]	[4% to 6%]	[under 1%]	[2% to 3%]	[3% to 4%]

If one were to assume that the marginal increments to regional trade had the same structure and "import content" as the remainder, it would appear that, over the 1967-9 period, El Salvador's trade was adding 1 to [illegible] its GNP every year or about ¼ of its annual average growth; for Honduras very little indeed; for the region as a whole about 1/7 of the growth rate or •7% to •1% p.a. This approximation is close to the conclusion of Nugent and McClelland though arrived at quite differently. The figures for "shiftable" losses and for a multiplier are complete guess work and the existence of positive gain from membership for Honduras is, thus, questionable.

One should not forget that there is also the factor of gains and losses from the break-up of regional institutions. The only one with major distributive implications is the Integration Bank. The average

disbursement per country has been the 1961-68 period - Guatemala $3·4m; El Salvador $3·6m; Honduras $4·4m; Nicaragua $4·3m and Costa Rica $3m. Were this sum to have been allocated on a basis of GNP the figures would have been, (if one assumes that in the absence of the Bank, foreign capital aid of these volumes would still have come in, and in proportion to recipient GNP) Guatemala $6·25m; El Salvador $4·75m; Honduras $2·53m; Nicaragua $2·9m; Costa Rica $3·28m.

There is an effective (apparent) annual redistribution with dissolution of:

Guatemala	+ $2·85m	Honduras	← $1·77m
El Salvador	+ $ ·15m	Nicaragua	← $1·4m
Costa Rica	+ $ ·28m		

However, some of the capital aid to CABEI would probably not have materialised otherwise and the cost to Guatemala and the benefit to Honduras of staying in the CACM is overstated.

(vii) Other Costs & Benefits: So far the analysis has been entirely in terms of gains and losses in income terms. However, that is not the only criteria. For example, in their study of likely gains in the West Indies, Andic, Andic and Dosser separately calculate the effect of integration on employment creation, capital investment, foreign exchange earnings, as well as income effects.(1) The employment effect is of great importance but is unquantifyable given the data, and we cannot meaningfully separate out the considerable indirect effects which are a great deal more important than direct effects (derived demand for agricultural imports, multiplier effects, the effect of competition between new industry and the artisan sector). As far as foreign exchange is concerned, it seems to the author to be inherently dangerous to talk about 'saving imports' without reference to costs, especially as the countries do not evidently suffer from chronic balance of trade and 'trade

(1) F. Andic, S. Andic & D. Dosser: "A Theory of Economic Integration for less Developed Countries" University of York 1971, Reviewed in Journal of Common Market Studies 1972 by P. Robson pp.363-368.

gap' problems. However, as far as it was possible to establish a figure, about one half of intra-regional trade represented inport substitution (i.e. gross I-S; net I-S is very much less) and the rest was explained by competition between existing producers or 'consumption effects' due to lower prices.

Two particular areas of concern have been the effect on customs duties and foreign investment, and these will be looked at separately.

Tax Revenue

Even though the loss of tariff revenue on regional trade is essentially a transfer problem, as tax loss is turned into higher value added, one of the most serious problems of economic integration amongst developing countries concerns this loss of revenue.(1) It is related to the question of 'balance' in the sense that the country which loses revenue does not necessarily acquire the compensating benefit if manifested in higher factor payments in the producer country. "The greatly diminished importance of tariffs as a source of revenue in advanced countries can be counted as one of the most important factors that has accelerated the formation of customs unions and free trade areas among advanced countries,"(2) and "the feat that customs unions would result in a loss of revenue has sometimes operated for prospective members as a factor against proceeding with customs unions negotiations. It is of course a probable result, where prospective members have a large volume of dutiable trade with each other before the customs union and also where a customs union will divert a large amount of import trade from outside countries to member countries."(3)

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(1) There remains, however, gains or losses from shifting to a more or less efficient method of tax collection.

(2) Hirofumi Shibata: "Theory of Economic Unions in Common Markets" in C.S. Shoup: "Fiscal Harmonisation in Common Market" Part II, 1967, p.224.

(3) J. Viner: "The Customs Unions Issue" op. cit. p.66.

The pattern of taxation in Central America is one of extreme dependence on imports in all Central American countries:

Diagram Showing Aggregate Current Revenue of Five Central American Governments, 1956-65 (Current Prices)

	1956	1958	1960	1965
Direct Taxes, (mainly income tax)	27·7	33·3	34·5	71·9
Import Duties	104·4	114·9	120·3	132·2
Other Indirect	103·0	97·2	95·5	156·1
	266·9	275·3	280·3	401·5

Source: World Bank Report Statistical Appendix Table 4.
Notes: The "total" includes other sources of revenue.

Import duties accounted for over 40% of revenue at the inception of the Common Market. In several cases this figure was substantially higher (55% in Nicaragua and Costa Rica) and the lowest (Guatemala 35%) is still very high by international standards. One might also say that this is due, in part, to a refusal to find other bases for taxation. Revenues are about 9-12% of GNP in the five countries, and only Haiti has a weaker record of domestic public saving. To rectify this more general problem, the OAS/IDB have prepared detailed reforms, largely ignored.(1)

The main feature of the structure of duties (see Appendix 4) is that many rates on "competing" imports are so high as to be prohibitive. Duties on non-competitive imports, generally required as inputs for domestic production, are near-zero, thus generating negligible revenue. Non-competitive imports for final consumption are moderate to high providing substantial revenue. The formation of a common tariff did not greatly affect the structure of the tariff though it was raised in respect of several previously relatively low revenue tariffs which were raised to "prohibitive" levels for protective purposes.

Footnote on p178.

The effect of the Common Market would induce losses in the following ways, assuming for the moment that, in each case, customs duties are not replaced by other forms of taxation on consumption and that there is no income or profit tax:

(i) in respect of trade that was "diverted" to existing regional producers from outside suppliers, there would be a straight loss of revenue to the importing country which could be measured by the quantity imported from the region, multiplied by the level of the tariff.

(ii) in the longer run, regionally based "common market industries" will be developed which will involve a structural change amongst imports or as intermediate and capital goods are produced locally which were previously imported or embodied in imported final products. In this case there will be a revenue loss to both regional exporters and importers as both would have previously imported the good.

(iii) for products involved in trade "creation" (where there is "shiftability", for example) then there is no loss of customs duty as this was already forgone in the course of import-substitution nationally. If however, consumption taxes could be introduced to replace import duties then there is no reason, theoretically, why all import duties could not be replaced by taxes at the point of consumption.

If we consider the additional effect of income and profits tax then in cases (i) and (ii) there are no losses, but the exporter gains additional revenue in (i) in proportion to the value of his regional exports and in case (ii) in proportion to the value of total production. (Note, however, the income and profits taxes are exempted on many new industries). In case (iii) the regional importer will lose income and profit tax.

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(1) Pan American Union: "Report on the Central American Development Plans 1968-69" op. cit. pp.145-157.

One of the basic difficulties in quantifying gains and losses in revenue terms is that one is again trying to contrast the present with the hypothetical situation of common market break-up. What would be the structure of imports and production after the break-up? What would be the relative importance of (i), (ii) and (iii) above? To what extent can the countries concerned shift the tax base? One can only make hypothetical assumptions.

It is fairly clear that although tax rates have been adjusted upwards in many cases (in specific if not ad valorum terms), the ratio between duties collected and imports has fallen, partly due to the Common Market and partly due to various exemptions. Between 1962 and 1966, import duties as a % of imports from outside Central America fell as follows:

	% in 1962	% in 1966
Overall	23	17
Guatemala	21	16
El Salvador	23	15
Honduras	25	18
Nicaragua	18	15
Costa Rica	27	20

Various attempts have been made by worried governments and other bodies to calculate the loss of revenue attributable to the CACM, and to compare this with the implications of other major revenue policies such as tax remissions to investors.(1) In the 1969-72 Plan the Costa Rican

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(1) UN(ECLA): "Repercusiones Fiscales de la Equiparacion de Impuestos a la Importacion y del Libre Comercio en C.A." E/CN.12/CCE/110.
SIECA: "Analysis de perdidas de ingresos fiscales atribuibiles al proceso de integracion economica" (SIECA/CEN/3-68). Guatemala 1968.

government gives the following figures for exonerations of import duty on intermediate goods and on intra-regional trade (in $m).[1]

	Integration Agreements	Law of Development & Industrial Protection	Total Actual Income from Imports
1962	1.5	1.3	-
1963	2.8	2.1	-
1964	7.7	5.6	30.0
1965	13.4	10.0	32.0
1966	19.0	11.9	32.0
1967	34.6	15.0	26.0
1968	43.2	27.7	25.0

It can be seen that as a proportion of revenue collected (and therefore, of the total budget to a large extent), "losses" from intra-regional trade are substantial. However, as the Costa Rican planners themselves acknowledge this in an unfair comparison as some of the "losses" are overstated:-

(i) some trade is genuinely "trade creating", whose production yielded no revenue anyway,

(ii) the calculation ignores offsetting direct and indirect tax receipts,

(iii) some trade is agricultural; on which import duties are often exempted anyway.

They redid the calculation on the assumption that there would remain a fixed relationship between extra-regional imports and import revenue, and projected forward an estimate of revenue for the import volume of later years, based on a simple regression from the pre-Common Market period. They come up with the following figures:

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(1) Costa Rica: "Previsiones del Desarollo Economic y Social 1969-72 y Planes del Sector Publico" Tomo 1 pp.241-245.

	Import Duty Collected	Estimated Duty Without Integration	Difference	Import on Locally* Produced Commodities	"Net" Loss
1964-68	145·4	215	69·6	40·9	28·7
1964-67	120.0	163	43·0	17·3	25·7
1964	30·0	33·0	3·0	-	3·0
1965	32·0	42·1	10·1	2·7	7·4
1966	32·0	42·2	10·3	3·8	6·5
1967	26·4	45·8	19·5	10·6	8·9
1968	25·0	51·0	26·6	25·0	1·6

* This figure includes duties on gasoline and sales tax.

It can be seen that if these two offsetting factors are taken into account, the "loss" is much less. However, even this estimate is not reliable:

(i) loss from membership may be overstated because proceeds from income and profits tax on additional exports are ignored,

(ii) losses are understated in that the figures for "offsetting" excise duty are too large. Some of the revenue (e.g. on gasoline) would be obtained from a national refining of oil in the absence of the Common Market, and the same is true of several items subject to sales tax, in non-tradeable services for example,

(iii) the import structure and the propensity to import are assumed unchanged.

There have been various other estimates for Costa Rica:[1] one in particular should be mentioned. A group in the Costa Rican Central Bank tried to isolate the effects of the common market, of the industrial incentive laws, changes in tariff rates, import structure and "residual" factor; in explaining any shortfall in revenue from yields predicted on the basis of a constant import and tariff structure over the 1962-68 period.[2]

(1) e.g. Ad. Hoc Committee on Central America: (CIAP/272): "Evaluation of Costa Rica's Economic and Social Development Plan 1965-68".

(2) The calculations were made in an unpublished paper by Central Bank officials; made available to the author by Prof. Robson of St. Andrews.

The effects were analysed as follows:

	1962	1963	1964	1965	1966	1967	1968
Estimated revenue on the basis of 1962 performance	28·9	31·6	35·4	45·5	45·5	48·5	54·8
Shift to CACM commodities from extra-regional commodities		- ·3	-1·6	-3·8	-5·0	-8·0	-12·0
Exemption policies		-1·0	-4·3	-10·7	-11·2	-13·7	-15·5
Import of tariff changes		·3	·1	- ·4	2·3	·2	3·3
Residual		·5	·1	1 ·3	2·1	- ·8	- ·6
Actual duty collected	28·9	31·1	29·7	31·8	31·7	26·3	23·4

It can be seen that there are losses due to CACM trade which rise to half the revenue collected in 1968. If consumption, income, and profits tax yields were to be considered, there would be a small offsetting factor, which would go a considerable way to cancelling the loss.

A Guatemalan calculation did try to eliminate exaggerated estimation of fiscal costs, while noting that import duties had fallen dramatically from 40% to 20% as a proportion of fiscal incomes. This was attributed to causes other than the Common Market. Two hypotheses were put forward;(1)

(i) assuming a fully "trade diverting" pattern of trade, the "cost" will be the volume of regional imports (less those items that would have been traded anyway) times the external tariff, minus the national income gain from the union multiplied by the proportion of tax (excluding import duties) in the national income.

(ii) assuming a fully "trade creating" pattern, then revenue gains or losses are solely income and profit tax yields from the net trade

(1) Guatemala: "Plan de Desarrollo 1971-75" Secretaria General de Congejo Nacional de Planificacion Economica, pp.263-275.

balance, (ignoring consumption effects).

They produce alternative guesses of ₡13m gain and ₡16m loss in fiscal terms to Guatemala from membership of the Common Market (1969). The assumptions represent reasonable outside estimates but the spread is too wide to be meaningful.

The most vulnerable to fiscal loss is Honduras which has a large balance of payments deficit with its partners and has experienced very little gain in income terms from membership. Using the Guatemalan methods, if we were to assume 100% trade diversion, then Honduras would lose approximately ₡14m. This is an inflated figure as the CET is higher than the previous national tariff. If there were 100% trade "creation", then there would be a revenue loss of ₡3m. However, anywhere in the middle of this range still represents substantial revenue loss.

Finally, Nicaragua estimated that the following amounts of revenue were "lost", and tried to identify the source (in ₡m).(1)

	1965	1966
Duty exemptions on regional trade	20·5	21·8
Industrial Protection Laws	7·1	9·1
Others	3·6	7·1
	31·2	37·0

The Nicaraguan government made much of these "losses" which amount to 100% or more of import duties actually collected. However, for reasons already indicated, the picture is distorted, the calculations are non-rigorous and ignore important potential gains. If the Guatemalan calculation were re-done for Nicaragua, one might predict revenue losses

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(1) Nicaragua:, Banco Central: "Informe Annual:"1966, p.246.

in 1968, of slightly smaller magnitudes than those estimated for Honduras ($3m to $10m) though the situation improved considerably when Nicaragua's regional trade balance moved into surplus in 1969-70.

To conclude, the superficial picture of large revenue losses, which are shown by direct calculation of losses, are greatly exaggerated. Nevertheless, Honduras, in particular, has experienced considerable loss of revenue. Moreover, concern over the losses caused by regional trade should not obscure the fact that a much more serious loss of revenue arises from a lack of willingness to realise the full taxable capacity of the regional economy for political reasons. There is no doubt that many more times the present tax yield could be obtained by switching the tax base from imports to income, profits, property and high income consumption.(1) Or the revenue situation could be improved by joint and selective increase of the external tariff as occurred in 1968.(2)

Overseas Capital Flows

One effect of the CACM has undoubtedly been to stimulate an inflow of private capital into the region. This is because of the nature of the industrial development which is to substitute overseas imports, providing an incentive to previous importers to "jump the tariff" in order not to lose their market share. The larger and expanding regional market is a further attraction to overseas investors.

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(1) M. Best: "Determinants of Tax Performance in Developing Countries: the Case of Guatemala" Ph.D. Oregan, 1970 (unpublished)Microfilm. Clark Joel: "Tax incentives in Central American development" Economic Development and Cultural Change, Vol. 19, No. 2, 1971.

(2) S.I.E.C.A. "Medidas de emergencia para la defensa de la balanza de pagos en Centro-America" [illegible] SIECA/A/LEC-CMCA-II DT2, 1968, (The Protocol of San Jose).

Diag. 3-20 shows the main trends in private overseas investment (POI). Aggregate flows are unfortunately not broken down sectorally and it is also difficult to separate out 'pure' equity investment from suppliers credit and other forms of long term financing. What the gross figures show is that there has been a discernable increase in direct investment in the Common Market period. This is less obvious in the case of Guatemala, where the large inflow of investment commenced in 1955/6, but the contrast is particularly sharp with El Salvador and Honduras where the nineteen fifties were characterised by a large scale export of capital (by local residents transferring liquid assets to safer hoards in the U.S.A.).

Some of this recent investment is surely due to the Common Market, though there were other influences at work notably the national import substitution policies and the investment incentives. Most new investment has been in manufacturing. This can be clearly seen from Diag.3-20a which shows the state of American investment in Central America. However, one should not exaggerate this: the massive increase in investment by the oil companies was almost entirely in the six oil refineries and this is twice as great as investment in the whole of the rest of the manufacturing sector together. In Guatemala (Diag.3-20b) the $20m foreign investment in two refineries (now nearer $30m) is substantially greater than in the rest of manufacturing. McClelland has estimated that over the period to 1968, only 5 to 10% of gross fixed investment in manufacturing was from overseas.(1) From Diag.3-20b it can also be seen that the total U.S. investment in public services and agriculture, which in 1965 still accounted for half the total, have not increased at all in recent years, though certain other sectors (e.g. cotton) have benefited from an inflow of capital.

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(1) D. McClelland: "The Central American Common Market" op.cit. p.94.

Private Investment Flows and Profit Remittances 1948-68

	48[B]	49[B]	50[B]	51[B]	52[B]	53[B]	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68
Guatemala																					
A Direct Investment	1.0	3.3	1.5	-.2	-1.6	-2.9	.2	3.7	6.0	16.7	13.9	19.5	16.8	7.6	9.3	0.5 Ø	6.1	14.1	14.5	18.2	22.8
B Investment Income	7.1	7.2	2.8	(2)	(6.9)	(4.5)	2.5	.5	3.1	2.8	3.5	3.6	4.3	5.6	7.0	3.0	11.2	11.4	18.0	18.2	13.8
C (net)	-6.1	-3.9	-1.3	-1.8	-5.3	-1.6	-2.3	+3.2	+2.9	+13.9	+10.4	+16.0	+12.5	+12Q	+2.3	-2.5	- 5.1	+2.7	-3.5	0.0	9.0
Undistributed Profits in A & B												4.4	.5	4.2	5.3	5.3	1.6	8.3	9.3	8.3	11.0
El Salvador																					
A			-.8	-1.9	-4.1	-6.9	-11.9	-9.8	-4.1	-4.0	.1	1.1	11.2	7.7	18.1	15.5	23.8	18.0	12.1	24.6	20.4
B			3.9	4.0	5.6	6.1	6.5	5.0	5.2	5.2	6.2	6.7	7.5	7.0	8.4	11.0	11.0	13.1	14.2	16.2	15.2
C			-4.7	-5.9	-9.7	-13.0	-18.4	-14.8	-9.3	-9.2	-6.1	-5.6	-3.7	-.7	9.7	4.5	12.8	4.9	6.4	8.4	5.2
Undistributed Profits in A & B													3.6				6.3	6.2	7.0	7.3	11.0
Costa Rica																					
A	2.0	-.6	.6	2.4	1.1	.2	.9	3.6	4.4	.2	.9	8.0	2.4	7.7	12.0	14.0	7.9	0.1	14.6	15.7	4.5 E
B	8.2	15.3	13.5	12.1	14.7	11.9	11.7	7.5	.3	6.3	8.1	3.0	2.6	1.1	6.0	4.2	7.2	8.4	7.1	9.1	10.8
C	-6.2	-15.9	-12.9	-9.7	-13.6	-11.7	-10.9	-3.9	+4.1	-6.1	-7.2	+5.0	-.2	+6.6	+6.0	+9.8	+.7	-8.3	+7.5	+6.6	-6.3
Undistributed Profits in A & B																	1.4	3.2	2.2	1.6	.4

Source: IMF Balance of Payments Year-books 1950-1970

B all long term private capital asset increases
Ø large payments for a telephone installation made by government
E compensation for Govt. take over of power company included here.

Private Investment Flows and Profit Remittances 1948-68

		48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68
Honduras	A								4.2[B]	.5[B]	5.8[B]	-9.9[B]	-5.2	-15.2	-15.0	-2.1	+5.0	13.9	12.6	16.5	17.5	28.8
	B								(.3)	24.3	7.0	11.6	5.8	(16.8)	2.1	8.2	11.0	12.5	23.5	30.0	40.0	44.7
	C								-4.5	-24.8	-12.8	-21.5	- .6	1.6	-17.3	-10.3	-6.0	+1.4	-10.9	-13.5	-23.5	-16.5
Undistributed Profit in A & B																		4.9	9.2	14.5	15.3	16.3
Nicaragua	A			2.1	1.1	2.2	2.0	2.0	2.0	2.0	2.6	2.4	1.5	1.7	6.0	5.4	4.6	9.3	8.2	12.2	14.5	16.4
	B			5.9	6.3	5.4	6.7	5.6	7.7	4.0	.7	3.3	1.7	1.2	2.2	2.2	1.7	4.5	12.2	14.9	15.7	18.9
	C			-3.8	-5.2	-3.2	-4.7	-3.6	-5.7	-2.0	+1.9	- .9	- .2	+ .5	+3.8	+3.2	+2.9	+4.8	-4.0	- 2.7	-1.2	-2.5
Undistributed Profits A & B																		17	6.0	7.1	7.6	7.7

Source: IMF Balance of Payments Yearbooks 1960-1970

B all long term private capital asset increases.

3-20a

Diag. A Structure of Foreign Investment in Guatemala: 1965

Agriculture	$ 16.6 m (of which United fruit is $11m)	14%
Mining	1.6 m	1.4%
Manufacturing	15.95m	13.6%
Petrol Refining	19.34m	16.5%
Construction	3.36m	2.9%
Electricity	13.5 m	11.6%
Trade (esp. Banking)	20.4 m	17.4%
Transport (esp. Railways)	29.0 m	22.0%
Services		.6%
Total	$117.0 m	100%

Source: Banco de Guatemala, "Sector Externo; Estadistico" 1966.

Diag.3-20b American Investment in Central America (1965)

	1965	1955	1960
Mining	$ 35m	15m	20m
Petroleum (mainly refining - also exploration	140m	40m	50m
Manufactures	56m	2m	15m
Public Services	127m	95m	126m
Trade	27m	10m	16m
Others (esp. Agriculture)	151m	145m	149m
Total	$536m	307m	376m

Source: (1965) Lederer & Cutler: "International Investment of the USA in 1966" as reproduced in Comercio Exterior (Mexico) Aug. 1968, p.680 and [illegible] the U.S. Survey of Current Business.

The pros and cons of overseas investment and the balance of gain and loss to investing countries and investors has been dealt with elsewhere.(1) The most important contribution of F.O.I. is that in its absence, much of the industrial development that has occurred within the CACM would not have done so, because of the absence of local capital and entrepreneurship. However, concern has been expressed about three points:

(i) first, that profits repatriated from investments are an extremely high proportion of investment, especially when local capital is used to provide supplementary fixed interest capital. Diagram 3-19 shows total profit remittances are greater than, or at least a high proportion of new capital invested, such that net investment was negative in Honduras and Nicaragua even in a period of high investment. The contrast is a little unfair, in as much as the remittances are from previous investment in agriculture and utilities, as well as from the new manufacturing investment. But a recent study on overseas private investment in manufacturing in Latin America and Africa suggested that three or four year payback periods are very common,(2) & there are important cases in Central America of over 100% (largely tax free) returns on capital.(3) Indeed, these figures understate the profit repatriated as much of this is undoubtedly concealed in inflated prices for imported raw materials and equipment from the home company which are tied to the project.(4)

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(1) T. Balogh & P. Streeten: "Domestic v. Foreign investment" Bulletin of the Oxford Institute of Statistics, Aug. 1960, p.220. G. McDougal: "The benefits and costs of private investment from abroad: a theoretical approach" Economic Record, March 1960, pp.13-15. C. Kindleberger (Ed.) : "The Multinational Corporation". R. Vernon: "U.S. enterprise in the less developed countries: evaluation of cost and benefit" and I. Little: "The value of private overseas investment" both in G. Ranis (Ed.): "The Gap between Rich and Poor Countries" IEA 1971 pp.210-228. E. Penrose: "The state and multi-national enterprises in less developed countries" in J. Dunning: (Ed.) "The Multinational Enterprise" Allen & Unwin 1971. P. Ady (Ed.): "Private Foreign Investment and the Developing World" Praeger 1971.

(2) C.S. Gray: "Resource Flows to Less Developed Countries", Praeger 1970 pp. 27-36.

(3) D. McClelland: "The Central American Common Market" op. cit. p.217.

(4) C.S. Gray, ibid p.36.

However to indicate that profit remittances may be very high does not in itself indicate that there is a real income loss relative to other feasible alternatives (which may simply be non-investment); it may merely indicate that a proportionately large share of the proceeds are appropriated by the investor.

(ii) it is argued that overseas foreign investment has tended to be badly allocated, distorting the manufacturing sector in favour of "easy" import substitution industries incorporating a small technological component, limited local raw materials and labour, operating inefficiently behind tariffs and duplicating wasteful product differentiation and marketing methods in the narrow Central American markets. However, we have to separate out cause and effect. These inefficiencies are not a product of foreign investment per se.

The low usage of local raw materials owes something to the system of tax incentives which apply to new firms, indigenous or overseas.(1) Also much foreign investment in manufacturing has tended to be in sectors where markets and competition are weak, and the less attractive features of monopoly and oligopoly are to be anticipated as a consequence of private investment, overseas or indigenous. Indeed, to embark on a strategy of protected import substitution without planning or controls will inevitably

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(1) However, tax incentives are more generous for industries which help the balance of payments, and have a high value added (category B rather than C under the Agreement on Uniform Central American Fiscal Incentives to Industrial Development).

lead to distortions whatever the origin of the capital and this will lead to a loss of welfare.(1) And as far as production techniques are concerned the degree of capital intensity is probably only a very indirect function of who owns the capital: much more of the product. The technique of production is incorporated not in the system of financing, but in the capital goods which, in Central America, would be imported whoever owned the capital, as there is no indigenous capital goods industry.

Nevertheless, the use of POI rather than indigenous enterprise inevitably creates problems of its own. This is partly because the 'cost' of any inefficiency in industrial structure is shipped overseas in foreign factor payments. Also, the cost of protection which we have shown in several key sectors "could have been minimised by selecting one or two firms in each activity .... but the pressures of international oligopolistic warfare led to a multiplication of uneconomic plants in infant activities.... Governments have been too weak or shortsighted to resist the pressures of oligopolistic strategists who favour keeping a toe held in every market".(2) The evidence of very low use of local raw materials is again in part a consequence of the desire of the overseas investor to maximise the use of components and supplies and management from the rest of the company which, through the operation of 'transfer ' pricing may incorporate much of the profit earned by the subsidiary.

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(1) H. Johnson: "The possibility of income losses from increased efficiency or factor accumulation in the presence of tariffs" Economic Journal 1967 pp.151-54.

(2) C. Diaz Alejandro: "Direct Foreign investment in Latin America" in C. Kindleberger: "The International Corporation" op.cit. p.326.

It should be said that there are a few showpiece cases where overseas companies have consciously built up very strong backward linkages locally, especially in food processing,(1) but it is still conspicuous that those basic industrial projects which were planned to be at the centre of the common market's industrial activity, pulp paper, pig iron, glass, which would use local raw materials and require some technological ingenuity, have, so far, failed to attract investors, by contrast with the numerous assembly and packaging operations.(2) For a profit making enterprise, only seeking to maintain a market share there is clearly very little incentive to make costly adaptations to its range of products,(3) to use local suppliers, or to transfer technology and to change its production techniques, certainly not for a peripheral market like Central America.

(iii) it is further felt that the process by which US concerns buy out local medium size enterprises, thereby discourages local entrepreneurship, reduces competition and promotes capital export: "it is argued that while the common market was developed, partially to discourage capital flight from Central America to U.S. and European money markets, pressure from

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(1) Examples of this are the efforts of Ralston Purina (Guatemala) to develop chicken farming amongst peasants; the Philip Morris cigarette plant which uses, after encouragement, local tobacco growers; Adams chewing gum (Guatemala and El Salvador) which is believed to buy 95% of its requirements for processing foods locally (cheese, jams and jellies, mayonaise and salad dressing); and United fruit which makes banana puree for baby foods in Honduras. Business International Corporation: "The Central American Common Market: profits and prospects in an integrating economy". op. cit.

(2) The Integration Industries Scheme has embraced very few of these industries as yet. One of the two approved plants (caustic soda and toxaphene) incorporates a highly advanced technology: this is only the second toxaphene production in the world using this advanced method.

(3) The paint industry is an exception but that was in response to experimentation with cheaper lines by a local company - Kativo Chemicals.

foreign corporations now moving into the Central American Common Market may by undermining indigenous investment and enterprise actually intensify the flow of Central American American capital abroad".(1) One of the results of these complaints has been greater interest in the idea of "joint partnership" to avoid a situation "wherein in the absence of deliberate action to stimulate indigenous enterprise it can happen that the main effect of regional tariff reduction may be to encourage foreign enterprises to set up subsidiaries in the Common Market ... and this causes the lines of integration to run from parent to subsidiary rather than between countries".(2) In fact, the whole system of tax incentives (biased to "new" enterprises) and commercial bank operations (biased to "safe" borrowers) disfavours the local enterprise. In a sense this is a 'nationalistic' rather than an economic point, but nevertheless the adverse effects on local entrepreneurship does have long term economic significance: "the displacement of local factors of production and the stunting of local abilities which can occur in the wake of overseas private investment is sometimes absolute".(3) Nonetheless, the skills acquired and the technological sophistication of the processing methods are likely to be more useful than those of local producers in most cases.

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(1) R. Hansen: "Central America: Regional Integration and Economic Development" op. cit. pp.54-55.

(2) S. Dell in R. Hilton: "The Movement Towards Latin American Unity" op. cit. pp.68-69.

(3) A. Hirschmann (quoted by Economist Intelligence Unit): "Investment in Latin America" QER Special No. 6.

(iv) the main reason underlying the fear of take-overs and an expansion of overseas investment is that as small countries, the Central American states are vulnerable to an additional loss of their already heavily circumscribed economic and political sovereignty. Only in 1954, Guatemala had the experience of being invaded and its government overthrown when action was taken by the government to acquire surplus land from the United Fruit Company. Loss of control is feared in more subtle ways: the sacrifice of local interests to global corporate strategy as, for example, in not developing third country exports; or in using "arms-length" transfer pricing to avoid local exchange restrictions and taxation (though in practice exchange restrictions are very limited and tax is exempted anyway from most of the new companies). But Central American attitudes are often little more than an emotional rejection of American influence, of "porto-ricarisation" and other visible manifestations of the evident political and economic dominance of their northern neighbour.(1) For this reason 'foreign' investment, by Mexicans, Colombians, Italians and others is welcomed even though its conduct is objectively no different than that of U.S. subsidiaries.

To summarise, we cannot make any meaningful estimation of the costs of benefits of the large volume of POI which has attended the integration process. A good deal depends on what would have happened in the absence of POI. If POI is the only investment that would have been forthcoming then its <u>total</u> effect must be considered including its effect on the volume

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(1) To many Latin Americans this dependency is accelerating ("sucuralisation") as American producers develop their existing assets (assuming that they do not repatriate the profit). O. Sunkel: "<u>National Development Policy in Latin America</u>" Journal of Development Studies, Oct. 1969, pp.33-34.

of exports and import substitutes that it creates. If POI replaces domestic investment then differential effects need to be considered. Vernon has shown that on reasonable assumptions the latter kind of defensive investment is much more likely to result in a net loss to the recipient:(1) in Central America most foreign investment is of the other kind and it is fair to say that without it, the gains would not have materialised to the same extent.

There is no evidence that the flow of public capital ("aid") has been affected either in volume or distribution by the CACM except in as much as it has affected regional institutions like CABEI.(2)

Unequal Gains

Heavily qualified though our results have been, it is, nevertheless, clear that whatever measure is employed Honduras appears to have derived less benefit, and Guatemala and El Salvador more benefit, from the union and that dissolution of the union would lead to less loss for Honduras (and perhaps even gain). This should be linked to the debate which has raged ever since the CACM was started and which centred around whether the distribution of benefits (which was expected to be unequal) should be affected by a conscious policy of intervention in the free market and what the objectives of intervention should be.

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(1) R. Vernon: "U.S. Enterprise in the less developed countries etc." op. cit.

(2) J. McCammant: "Development Assistance in Central America" Praeger, 1968, Ch. 10.

Comparative experience of groupings elsewhere leads us to expect that disequaling tendencies will be set up. "If growth from low income levels is anticipated, mere elimination of restrictions on the flow of intra-Union trade and concomitant establishment of a common internal tariff will in general promote imbalance in spatial development"; (1) and given that the rationale for integration was based in part on the disequilibrating consequences of free trade in a world context, one might expect that trade liberalisation would have the same effect on a regional level: "free trade will bring unequal rates of development in whatever area or region it appears". (2)

The Integration Industries Scheme incorporates the principle of reciprocity; ("It shall be effected on a reciprocal and equitable basis in order to ensure that each and every Central American state may progressively derive economic advantage;" (3)) and there is a specific clause which states that no country should have more than one Integration Industry before the others have one each. This idea dates back to the original inception of the Common Market: "the concept of integration in Central America seems adequate as a point of departure ... to be limited integration accompanied by a policy of reciprocity." (4)

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(1) R. Birmingham: "International imbalance in customs unions among developing countries: adjustment mechanisms" Ph.D (Pittsburg) 1967, Microfilm.

(2) S. Dell: "A Latin American Common Market" New York 1966, p.146. This statement and the argument behind it is in complete contrast to the conventional trade theory which would predict factor price equalisation tendencies.

(3) Article I, Treaty on Central American Integration Industries, 1958.

(4) United Nations (ECLA) "Integration y Reciprocidad: Economios en Centroamerica" E/CN/12/AC. 17/3 (Committee for Economic Cooperation) 1952. Criticised in paper by P. Virelli, M. Tosco, and M. Hermann; Central Bank of Honduras 1952.

Nevertheless, definitions are difficult: one might also mention that ECLA have tended to use a definition which is whether or not integration gives accelerated development over what would have occurred within the national market alone. However, a much stricter principle is hinted at elsewhere, the principle of "balanced growth" ('desarollo economico equilibrado') which implies positive discrimination in favour of the less developed regional partners.(1) The Regional Bank, the Convention on Industrial Incentives, and the semi-formal Textile Agreement all have an implied or explicit commitment to direct proportionately more resources to the weaker states, notably Honduras.

The question of unbalanced development has worried three of the countries. Costa Rica was a reluctant joiner initially, being concerned that its high wages and more expensive social services (financed in an inflationary way) would cause the country's competitive position to be eroded:(2) its enthusiasm has also waned in recent years as the regional balance of payments situation has deteriorated, leading to withdrawal, temporarily, in 1972. Nicaragua had a period of disillusionment when it left the Common Market, but that appears to have been a temporary aberration. There is, however, recognition that its industrial base is weak.(3) Honduras has always been acknowledged to have the greatest initial handicaps: a lower income per capita, a weak industrial sector, poor

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(1) I. Rosenthal: "Consideraciones acerca del 'desarrollo equilibrado'" Universidad de San Carlos LXXI Jul.-Sept. 1967, Guatemala, pp.95-107.

(2) E. Staley: "Costa Rica and the Central American Common Market" Economica Internazionale 1962, No.1. The reasons given for Costa Rican Resitancy were given by Snr. Borbon, her foreign minister, as (a) the absence of a "complementary" role for Costa Rica's industry in Central America: (b) fear of the low wage countries attracting all new investment, (c) loss of customs duty, (d) loss of economic sovereignty. Costa Rica was eventually persuaded that only limited loss of sovereignty was involved and that her skilled labour and political stability were a major attraction for foreign investors: S. Borbon: "Serie Problemas Nacionales" No. 12 Costa Rica, 1962.

(3) United Nations (ECLA): "El desarollo de la economia Nicaragua y situacion comparativo, que occupa dicho pais en el mercado centroamericano" (CEPAL/MCX/10) and "Analysis y proyecciones del desarrollo economico de Nicaragua" (E/CN.12/742) Mexico, 1966.

industrial sector, poor communications, and at no stage, subsequently, has it showed any evidence of narrowing the gap which divided it from its neighbours.(1)

The evidence which was presented in the earlier part of the chapter indicated that Honduras appeared to have realised small gains in the past and could possibly gain from dissolution. Costa Rica has not, evidently, gained to any significant extent, but there is less obvious source of loss either. The other three partners appear in various degrees to have had past gains and have future expectation of gain.

A more widely used convention for establishing gain has been the balance of trade, regionally, either in total or for manufacturing products. This is by no means a statement of gain and loss (it assumes implicitly a zero sum solution) but it is true that the gains are a function of regional exports and the losses a function of regional imports. Balance of payments trends are for statistical reasons very easy to demonstrate, and show developments over time.

As far as Central American trade is concerned, Diag. 3-21 summarises the 1960-70 period.

(i) Guatemala has persistently run a surplus about half or more which has been contributed by manufacturers, the rest by raw materials and foodstuffs.

(ii) El Salvador has consistently run very large surpluses of manufactures and deficits of non-manufactures, these latter becoming

(1) SIECA: "Economic growth of Honduras and the balanced development of Central American Integration" SIECA/CCE/IX/OT1: Foro Honduras, editions NO. 3 and 4; Banco Central de Honduras: "Honduras y la Integracion Centroamericana" Tegucigalpa, Jan. 1967.

Diagram 3-24 BALANCE OF TRADE AMONGST CENTRAL AMERICAN COUNTRIES ($m.)

		1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Guatemala	O	+1.8	+1.4	+1.8	+1.65	+3.3	+7.0	+21.2	+23.6	+28.0	+35.0	+41.5
	M	- .25	- .25	+1.9	+6.8	+4.1	+6.2	+15.5	+16.6	++14.8	+19.0	+25.3
El Salvador	O	+ .8	- .2	-3.8	-4.0	-4.2	+3.3	+ 5.5	+20.6	+19.6	+11.5	+14.5
	M	+3.8	+3.8	+3.2	+2.6	+2.5	+13.2	+13.4	+22.7	+29.1	+21.1	+23.8
Honduras	O	2.1	2.0	4.8	-0.1	+0.3	-3.1	-12.5	-17.2	-17.4	-20.1	-35.8
	M	- 2.0	-2.6	-3.8	-6.8	-8.8	-12.1	-14.5	-16.2	-18.9	-15.7	-25.8
Nicaragua	O	.65	-1.1	-1.3	-2.9	-6.2	-11.4	-16.7	-23.8	-19.9	-11.6	+ .2
	M	-1.2	-1.1	-1.3	-3.5	-5.3	-10.5	-16.4	-21.9	-19.9	-15.1	-10.0
Costa Rica	O	-1.65	-2.1	-1.5	+ .5	+6.8	+4.2	+ 2.5	- 3.2	-10.3	-14.8	-20.0
	M	+2.55	+ .15		+ .9	+7.5	+3.2	+2.0	- 1.2	- 5.1	- 8.3	-13.3

O = Overall
M = Manufacturing (i.e. 5-9 categories in the standard trade classification)

Source: SIECA "Cartas Informativas" (various)

Cumulative figures

G	O	+ 171.0
	M	+ 110.0
El Sal	O	+ 65.5
	M	+138.0
Hond	O	- 97.0
	M	- 127.0
Nic	O	- 92.5
	M	- 107.5
C. Rica	O	- 40.8
	M	- 13.6

relatively, less important since 1965, prior to which importations led to an overall deficit.

(iii) Honduras has run persistant and growing deficits on manufactures which were initially more than offset by exports of non-manufactures; but in recent years Honduras has even been a net regional importer of food-stuffs.

(iv) Prior to a remarkable improvement in 1968-70, the Honduran pattern was repeated in Nicaragua; in this case also agricultural exports, previously neglected, have helped to offset manufacturing deficits in the last two years. Since 1968, Nicaragua has replaced El Salvador as a supplier of manufactures to Honduras - shoes, furniture, pharmaceuticals, cosmetics etc.

(v) Taking the period as a whole, Costa Rica has been a slight loser in overall B. of P. terms, with a smaller deficit in manufactures. However, the Costa Rican relative position has deteriorated precipitately since 1965 and is causing considerable strain on the association at the present moment.

At a more disaggregated level we have isolated the following ways in which a laissez-faire grouping can lead to unequal benefits:

(i) losses of welfare as a result of "trade diversion" affecting disproportionately the net deficit partner in regional trade. This cost will not affect the consumers in the exporting country who would in most cases be bearing the high cost (or higher cost) anyway. There is, in Central America, not only the direct cost of the tariff, but a 'terms of trade' effect as the main regional trade deficit partner (Honduras) has a higher tariff profile for its regional imports than its regional exports. In as much as tariffs are effective and contain no "water", "the less favoured

region can be said to be financing the industrial development of the more advanced counterparts by paying higher than world prices for industrial products in intra-area trade." (1) However, this factor is diminished in significance by the fact that implicit tariffs are very much less than nominal rates. Where loss of quality is involved it is noteworthy that since the Honduran authorities placed restrictions on common market trade, "Honduras greatly prefers the industrial goods it now gets from the USA and Europe to those it used to get from its common market partners." (2)

(ii) the effect of liberalising free trade with one partner has a small and inefficient industrial sector, can be to inflict loss of activity and employment on the weaker partner; "in most cases free trade would strip all protection from the least developed of the countries and expose them to the unhampered exports of the semi-industrialised nations of the region permanently consigning the former to the status of a primary producing exporter." (3) In other words, the rationale for integration based on 'infant industry' industrialisation across the board must be satisfied in the partner states individually as well as collectively.

In Central America, dissatisfaction as expressed by Nicaragua, and Honduras, has been precisely over this question. Many of their intra-regional imports are "shiftable": textiles and clothes and simple

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(1) A.J. Brown: "Customs Unions versus Economic separation in developing countries" Yorkshire Bulletin of Economics & Social Statistics, Vol. XIII 1961, p.58.

(2) E.I.U. Quarterly Economic Bulletin (Central America) No.2. 1971.

(3) R.L. Allen: "Integration in less developed areas" Kyklos XIV, 1961 pp.329-330.

manufactures which could probably be produced domestically. When Honduras erected tariffs against the Common Market in 1971 it was quickly announced that several products were being substituted domestically; textiles, barbed wire, plastic and cardboard, brassieres, tiles, animal feed, bicycles, plastic shoes, buttons, toothpaste and fruit juices. (1) And in Nicaragua, one of the earlier bones of contention had been the effect of competition on existing Nicaraguan industry: it was reported in 1968 that all seven clothing factories had or were being forced to close under the impact of Central American competition. (2) If the processes of displaced production are more labour intensive than those of the more efficient firms, then competition may result in net unemployment in the region.

However, we have argued previously that "shiftability" is a long term and not a short term factor and not without costs of its own.

(iii) In fiscal terms the deficit partner suffers for two reasons; first from the revenue which is lost on "diverted" trade and the revenue forgone from taxation of income and profits on production (especially in manufacturing) which accrues proportionately more to the producers country of origin. As Brown puts it, "if we assume that the non-industrial territories pay prices for manufacturers of their partners which are equal to the prices of competing imports including import duty, then by being in the union they lose revenue equal to the duty on the manufactures which they buy from their union partners instead of from the outside world. Probably this loss of revenue brings about a reduction in real income". (3) However, we have seen that the revenue loss factor is generally exaggerated, in this context.

(1) E.I.U. (Central American Report) No. 2, 1971, p.13.

(2) E.I.U. (Central American Report) No. 2, 1968, p. 15.

(3) A.J. Brown: "Customs Unions versus economic separatism in developing countries" Yorkshire Bulletin of Economics and Statistics, Vol.XIII, 1961, p.88.

(iv) Dynamic Effects: one of the main products of largely unrestricted competition is likely to be the concentration of new investment and new industry in already industrialised locations. The phenomenon of clustering has been partly explained by Myrdal in terms of "backwash" and "spread" effects.(1) The former is the movement of capital and skilled labour towards the advanced centres; or in areas where there is minimal factor mobility there will be a differential attraction for overseas foreign capital. Offsetting this is the "spread effect"; the effect of increased demand for the products of the less developed periphery as a result of higher incomes in the rest of the area; and the diffusion of skills. One would expect that ultimately "spread effects" would tend to exert some influence if only because the "developed" areas will eventually be raising money wage costs (and congestion costs) to price themselves into an uncompetitive position (provided that labour productivity, and external economies do not increase even more rapidly). But one would expect spread effects to be small in the Central American area because of obstacles to diffusion: "with an imperfect price system, primitive transportation facilities and an uneven distribution of social overhead capital in these areas agglomerative tendencies assume greater importance." (2) Backwash effects do not operate through the mechanics of labour mobility and, in fact, Honduras is a major importer of migrate labour. What happens in Central America

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(1) S. Myrdal: "Rich Countries and Poor" op. cit. pp.30-35, or "Economic Theory and Underdeveloped Countries" London, 1957, Ch.3.

(2) B. Balassa: "Theory of Economic Integration" op. cit.

is that, "capital and industry cluster around areas which are already developed and industrially advanced and slip away from those areas which are insufficiently developed".(1) Widespread underemployment means that this agglomerative process can proceed without meeting a labour bottleneck even in the absence of labour mobility.

The reason for these "backwash" effects being predominant is partly due to the "market-orientated" nature of modern production methods and the resulting fact of market expansion feeding on itself.(2) But even with "footloose" industries,(3) there is the advantage of externalities as "the availability of economic overhead facilities (transport, gas, electricity, water supply, waste disposal, etc.) the availability of skilled labour force, ease of exchange of technical information and the existence of linked processes;"(4) and "the presence of some firms in an area will enhance an area's attractiveness to newcomers".(5) The latter point indicates that there is more than merely cost advantages to a favoured location: psychological factors are, if anything, more important and these have been powerful contributory factors to the "growth pole" concept of Perroux and others.(6)

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(1) Barzanti: "Underdeveloped areas within the Common Market" Princeton 1965, pp.332. (of Italy).

(2) B. Balassa: "Theory of Economic Integration" op.cit. p.126.

(3) The distinction between "market orientated" and footloose" industries and their relative importance is discussed in S. Florence: "The Logic of British or American Industry" London, 1953, p.40.

(4) B. Balassa - ibid pp.201-2 and 225-236; A. Hirschmann: "The Strategy of Economic Development" Yale Univ. Press, 1958, Ch.10.

(5) B. Massell: "East African Economic Union: an Evaluation and Some Implications for Policy" Rand Corporation Memorandum RC 3880 RC, Sept. 1963, p.39.

(6) F. Perroux: "Multinational Investment and the Analysis of Development and Integration Poles" in IADB: "Multinational Investment in Latin America" op.cit. pp.89-126.

However, the essence of the "growth pole" and "backwash" argument is that inequalities develop not from economic integration per se, but from the framework of laissez faire capitalism: "in a laissez faire environment in which unguided market forces determine resource allocation, cumulative movements in income inequality are likely to be set up. This will occur not only between nations, but also with a customs union as well as between the regions of a nation";(1) and "to leave the allocation of productive resources exclusively to the free interplay of market fources would be equivalent to concentrating development on the more advanced countries among the union members."(2) Development must be expected inevitably to have this unbalanced pattern and a rough rule of thumb is that "the smaller and poorer the country is, the more reason it has to fear that if it is merged in a larger market unit the major growth poles would arise outside its territory and this might adversely affect its development prospects even more adversely than do the limitations of small size."(3)

But it is not even necessary to have initial discrepancies in the level of development. If countries merge in order to industrialise, comparative advantage in industry is not initially apparent and "growth poles" may emerge accidentally in locations in countries where per capita

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(1) K. Griffin: "Reflections on Latin American development" Oxford Economic Papers, 1966, p.1 and 4.

(2) M. Wionczek: "Requisites for Viable Integration" in "Latin American Economic Integration" pp.3 and 9.

(3) W. Elkan: "How to beat 'backwash': the case for the customs drawback unions" Economic Journal March 1965 p.44.

income is either higher or lower than the initial average.

It can plausibly be argued that there is no self-correction for this process as the market mechanism fails to reflect the diseconomies of agglomeration: "the external economies due to the (growth) poles are, though, real, consistently overestimated by economic operators"(1)

Also businessmen may have a very short term horizon and be unreasonably concerned with "risk-avoidance" in the more backward areas.(2) All these factors produce a divergence between social and private costs and a bias against investment in the already "lagging" areas. The explanation for this tendency to polarisation in Central America is in fact, in terms of externalities. In Appendix 7 a look is taken at various possible exploratory factors; taxation, wage rates, "market potential" etc. None satisfactorily explain the weakness of Honduras, though El Salvador benefits from its high market "potential" and central location and Costa Rica's weak performance in recent years could be due to poor market potential as well as high labour costs. The only satisfactory explanation for the basic weakness of Honduras as a centre for new investment is in terms of the existing weakness in manufacturing and communications, as brought out in the diagram 3.23 below.(3)

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(1) A. Hirschmann, "Strategy for Economic Development" op.cit. p.185.

and "Capital growth in connection with indivisibilities, and rent lag, causes agglomeration of economic activities" H. Giersch: "Economic union between nations and the location of industry" Review of Economic Studies, 1950, pp.87-89.

(2) This problem is covered in a more general way in Yair Aharoni: "The Foreign Investment Decision Process" 1966.

(3) This would not be valid, however, if the greater manufacturing contribution in one country had been produced by protection of relatively high cost enterprises.

Diag 3-23 Indicators of Industrial and Infrastructure Development

(1968)	Guatemala	El Salvador	Honduras	Nicaragua	Costa Rica
Manufacturing Value Added (1968)	$250m	$186m (1969)	$101·5m	$99m	$149m
Improved Roads, miles per 1,000 sq. miles	169	339	33	34	178
Telephones per 1,000 population	7	10	4	7	16
%Literacy Rate	38%	48%	45%	50%	84%
% of Labour Force with Primary educ.	7%	6%	11%	7%	22%
Electrical Power for Industrial Use (1968) million kwm.	211	164	43	129	155

Source: Information obtained from: U.N. Year book of National Accounts; Inter-American Development Bank Annual Report of 1968 - "Socio-Economic Progress in Latin America".

Chapter 3

Conclusion: this chapter has tried to demonstrate some of the problems involved in calculating gains and loss from membership of the CACM, and to produce estimates. The figures do seem to corroborate the other source data and indicate significant benefit to the region, somewhat unevenly distributed to disadvantage Honduras. However, it should be stressed that limitations of data are a major handicap to making firm predictions and limitations of methodology present are undertaking other than retrospective or comparative static analysis; either of which may be a misleading guide to future policy.

An attempt is also made to explain the process of unequal benefits largely in terms of the 'agglomeration' of economic activity which takes place with (unrestricted) industrialisation.

Chapter IV A Regional Investment Policy

The rationale for a regional investment policy has been set out in the following terms:

"(a) such a policy is needed if maximum benefits are to be derived from inter-industry specialisation and from economies of scale, if duplication of effort is to be avoided and if it is considered that competition and private investment decisions are insufficient to provide these benefits:

and (b) a regional investment policy is at the same time needed to counteract the clustering effects of industrialisation and can be used to reduce the need for financial compensation agreements by ensuring a more equitable distribution of the employment and income generated by integration"(1) or by UNCTAD: "the following .... deserve special attention when the question of an investment policy for the region as a whole is examined .... a) equitable distribution of benefits; b) establishing priorities; c) avoidance of duplication." (2) Such a policy might also be of benefit in establishing a strange bargaining power with multinational investors.

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(1) F. Kahnert, P. Richards, E. Stoutjesdijk, P. Thomopoulos: "Economic Integration among Developing Countries" op. cit. p.42. A "regional investment policy" means joint planning in this context.

(2) U.N.C.T.A.D.: "Trade Expansion and Economic Integration Amongst Developing Countries Report by the Secretariat" op. cit. p.32.

Unfortunately, this is a subject that can easily become infused with dogmatism. Whether one chooses to deal with inefficient industrial structures, on one hand, by reducing protection to stimulate competition, or, on the other hand, with a regional investment policy using licensing and other 'dirigiste' techniques, can become a matter of political prejudice rather than economic analysis. The author's view is that both approaches are important but that a regional investment policy is a necessary, if not a sufficient, condition for dealing with the problems described. This is a position which enjoys respectable patronage if not universal support.(1)

The rationale is based on separate arguments and they should be dealt with independently.

I Economies of Scale, Market Structure and the Waste of Capital through Duplication

In Ch. I, we discussed, in very general terms, the importance of plant economies of scale and the magnitudes of some of the actual benefits manifested in the larger market were suggested. Here we shall try to consider economies of scale in the context of market structure. More formal

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(1) The case for inter-government agreement on industrial location is argued in (inter alia) A. Ewing: "Industry in Africa" Oxford University Press 1969 pp. 126-7:
United Nations (UNIDO). Industrial Development Survey pp.140-51: R.B. Sutcliffe: "Industry and Under-development" op. cit. pp.230-31: C. Dell: "A Latin American Common Market" Oxford U.P. 1966, pp.120-144,: J. Tinbergen: "Heavy Industry in the Latin American Common Market" Economic Bulletin for Latin America, March 1960, pp.1-8; K. Kojima: "Towards a Theory of Agreed Specialisation: the Economics of Integration" in Ellis, M. Scott, J. Wolffe. (Ed.) "Induction Trade and Growth" Oxford 1970 pp.305-324: M. Wionczek: "Requisites for Viable Integration" and H. Kitamura: "Economic Integration of Under-developed Regions" in M. Wioneczek (Ed.): "Latin American Economic Integration" op. cit. pp.3-21, 42-67.

definitions and analysis of economies of scale will be reserved for Ch. 5, but a good deal can be learnt from the attempts made initially by Bain, and more recently by Pratten to construct long run cost curves for a set of industries based on engineers' and economists' informed estimates.(1) The studies show first, the "minimum efficient scale" (or "minimum optimum scale") of production, which is the lowest scale at which minimum cost is realised (i.e. the lowest point in the average curve). Second, they show the sensitivity of production cost to plant size. The cost curve for each industry incorporates a great many simplifying assumptions which cannot all be spelt out here. The general picture is conveyed in Diag. 4-1. Alongside are set out details of the Central American market and the production of Central American firms, for the few cases where indigenous data is available. Comparisons may be misleading, as we may be dealing with different levels of technical development. However, the technology of W. Europe/USA is directly applicable, in as much as there is no local capital goods industry and the capital equipment used is imported from abroad and incorporates foreign technology and scale functions.(2) For interest separate estimates made by an Egyptian researcher are recorded too, but the "optimal" scale is rarely very different.(3) In Ch. I also, reference was made to the possibility for adopting existing technology - to 'minaturisation techniques' for example - but these were not considered important.

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(1) J. S. Bain: "Barriers to New Competition" Harvard, 1956, esp. Appendix B. C.F.C. Pratten: "Economies of Scale in Manufacturing Industry" Cambridge Dept. of Applied Economics, Occasional Papers, No.28, 1971.

(2) M. Merhav: "Technological Dependence, Monopoly and Growth" New York, 1967, p.6.

(3) M. Metawally: "The Effect of Market Limitations on the Industrialisation of Egypt" Yorkshire Bulletin of Economic and Social Research, May, 1967, pp. 37-49.

Diagram 4-1 Economies of Scale of Optimally Sized Units

Industry	M.E.S. (Minimum Efficient Scale)	Scope of A.C. curve (increase in costs as output falls by 50% from the m.e.s)	Central America Production	Central America Consumption
Flour	16,500 M.T. p.a.(B)	15%(P) 5-10%(B)	135,000 Tp.a. (exc. Costa Rica and Nicaragua) in El Salvador 2 mills produce 44,000 tons p.a.	-
Sugar Refining	350,000MT p.a (M)	9%(P)	172.5 million litres in El Salvadorone brewery produces 1m. barrels plus 14m. litres	350,000 M.T. p.a.
Beer	1 million barrels (P) 20 million litres (M)			
Cotton Yarn	6-11,000 MT p.a. (M) 60,000 spindles (P)	very small	50,000 MT in El Salvador (1966)	
Cotton Weaving	30-75 million metres (M) 1,000 looms (P)		38 million metres in El Salvador (1966)	
Rayon Yarn	50-75 million pounds (B) 25-65 (M)	8%	None	
Viscose Yarn	11 million pounds (M)		None	
Soap/Detergents	70,000 MT p.a. detergent (P) 10,000 MT p.a. soap	2.5% (P)	In 1966 7 Central American plants in market of 5,000 MTp.a. capacity from 900 to 3,000MT p.a.	
Fertiliser	45,000 to 300,000 MT p.a. of Ammonia (M)		None	
Ethylene	300,000 MT p.a. (P)	9% (P)	None	30,000MT
Nylon Fibre - polymer manufacture	80,000 MT p.a. (P)	5% (P)	None	1,000 MT
- extruded fibres	40.000 MT p.a.	7%	None	
Sulphuric Acid	1 million T p.a. (P)	1%	13,000 T p.a.	

	M.e.s	A.C. Curve	Production	Consumption
Matches	20-40,000 million sticks (M)		El Salvador - 1 factory producing 25,000 m. sticks	
Petrol Refining	200,000 bd. (P) (b.d. = barrels per day) 65-165,000 bd (M) 120,000 bd (B)	5% (P) 2% (B)	Six refineries from 8,000 bd. to 22,000 bd.	
Leather shoes	600 - 1,000,000 pairs p.a. (M) Factory <300,000 pairs p.a. (P) Other < 20,000 pairs p.a. 600 - 2,500,000 pairs p.a. (B)	2% insignificant	El Salvador 1.45 million pairs p.a. from 15 factories	
Cement	425,000 MT p.a. (B) 2,000,000 MT p.a. (P) 335 - 660,000 MT pa. (M)	10% (B) 9% (P)	5 plants varying from 120,000 MT p.a. to 600,000 MT p.a.	
Tyres and tubes	1.5 to 3.0 million units (B) 4 million units (M)	2-3% (B)	2 plants under 500,000 units p.a.	400,000
Steel production	9 MT p.a. (P) 1.3 MT p.a. (UN)	5-10% 18% (UN)	None	150,000 MT billet slab
Integrated Mill	1-2.5 million MT p.a. (B)	5% (B)	None	
Rolled Sheet	4 million MT p.a. (P)	8% (P)	None	40,000 MT
Rods, Bars and Pieces	5-6 million (P)	n.a.	Three mills produce 32,000 MT p.a. in El Salvador	
Fridges and Washing Machines	200,000 to 500,000 units p.a. (M)		450 p.a. in El Salvador	
Car Assembly	500,000 units (P)	6% (P)	Four small plants	300 p.a. of 20 makes
Cigarettes	20 billion (B) 4-35 billion (M)	1% (B)	5 factories ranging from .5 billion to 1.2 billion	

Notes and Sources:

(M) Metawally
(B) Bain
(P) Pratten
(UN) United Nations

(references in text.)

The tables show that there are a few industries where the Central American market, nationally or regionally, would be able to sustain a substantial number of producers of optimal size, such as flour milling, cotton yarn and weaving, shoes. (1) For a second category, the regional market could support one or two plants of optimal size: oil refining, soap, beer, matches, cement, cigarettes. However, in several of these cases there are one or more plants of sub-optimal size in each country and this appears to have contributed to substantial loss of economies of scale in oil refining and detergents, particularly. Thirdly, there is production at capacities well below the optimum in industries for which Central America could not, anyway, sustain an optionally sized unit: sulphuric acid, steel pieces, assembly of consumer durables and cars. Finally in most intermediate and capital goods industry, the limited market size has prevented any production at all in Central America: eg ethylene, rayon and viscose yarn, fertiliser/ammonia, nylon fibre, pulp and paper, iron and steel.

However, there are major qualifications that one must make to such a superficial analysis. The statistics are derived from engineering approximations and are only approximate. Firstly the product categories are far less homogenous in practice than appears to be the case: steel, paper, etc. consist of many quite separate sub-products. A consequence of this is that "in most manufacturing industries as distinguished by official statistics the first plant of minimum efficient size cannot hope to survive without export outlets unless the size of the market for the products of the industry as a whole has reached, say, three to ten times the value of the

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(1) The finishing of textiles requires larger units of production than the weaving/spinning stages. Economies of scale are quite important in flour milling too.

output of the first plant. On the other hand, once this 'threshold' has been passed, it need not take a very long time before a number of additional plants can be established in the same industry, each with a different production pattern. One interesting implication of this is that if, for example, three countries are individually too small to support a pharmaceutical industry, the integration of their markets for pharmaceutical products may well make possible the establishment within a relatively short period of not only one pharmaceutical factory of minimum efficient size between them, but of three or more such factories".(1) Secondly, transport costs can have the effect of reducing the 'optimum' size considerably. Thirdly, there may be changes over time: "mimiaturisation" may be a factor of importance in steel, cement or oil refining, (2) even though, in general, the tendency appears to be for technical optima to increase over time.

Economies of scale have, so far, been considered disembodied from market structure. For an industry with declining costs over the whole range of output required to satisfy the regional market, any plant which was not in a monopoly position would be technologically sub-optimal. But monopoly is generally associated with the misallocation of resources and "excess profit". There appears to be an inevitable conflict of objectives here: "the benefits from competition in a larger market may often be incompatible with one of the main arguments put forward in favour of integration: this is that larger markets would open up investment opportunities for plants that would not otherwise be built".(3) Or more stridently "if any size of the indivisibility

(1) P. Elkan: "How to beat backwash: the case for 'customs drawback unions" Economic Journal, 1965, p.65.

(2) This is discussed in R. Sutcliffe: "Industry and Under-development" op. cit. pp.240-241. However, he concludes: "these developments have not succeeded in making small scale output cheaper than large scale output; they have only served to reduce the cost disadvantages of producing on a smaller scale." Ibid. p.241.

(3) F. Kahnert, P. Richards, E. Stoutjesdijk, P. Thomopoulos: "Economic Integration Among Developing Countries" op. cit. p.19.

is greater than the size of the market, perfect competition with free enterprise is doomed". (1)

The coexistence of several producing units is impossible in perfect competition theory under conditions of decreasing costs, when the aggresive encroachment on other markets must lead to monopoly.

Expanding the market size in these circumstances would involve reducing a few pure monopolies to oligopolies; small group oligopolies to slightly larger group ólogopolies; while in other cases the larger market would enable new monopolies to be created. The likelihood of a high concentration will thus be very great; for in very few 'scale' industries will regionalisation advance the size of the market to the point where the cost curve has flattened out. Merhav has argued that countries which are industrialising but which have a backward indigenous technology must inevitably import "alien" capital-intensive, large scale techniques via imported capital equipment even though the level of aggregate demand is low and "the disparity between the scale of output to which it is geared and the extent of the markets, produces, at an early stage of growth an industrial structure in which technically inevitable monopolies are dominant". (2)

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(1) A. Lerner: "The Economies of Control" New York 1944 p.180, also see T. Skitovsky: "Economic Theory and W. European Integration" Stanford, 1958, p.124.

(2) M. Merhav: "Technological Dependence, Monopoly and Growth" op. cit. p.6.

The question then arises as to whether we should regard "monopoly" or somewhat more "competitive" if technically inefficient industrial structures, as more acceptable. The former has traditionally been regarded as the greater evil. In Central America the U.S. government gave vent to such anxieties, when criticising the Integration Industries scheme: "the US Government opposes 'integration industries' and considers that they will tend to limit competition and ultimately benefit neither the economy of the region nor the consumer". (1) However, the extent to which a monopolist can exploit his position will depend on the level of tariff (i.e. government policy) and on the willingness of government by taxation to appropriate all or part of the monopolist's profit. For these reasons, monopoly should not be regarded as posing an insoluble policy problem. Indeed the Integration Industries Scheme has a considerable array of controls to ensure that any regional monopoly is adequately policied. (2)

The more serious problem however is over-investment leading to a wastage of capital. Most recent writings on the Central American Common Market have referred critically to "the problem of duplication ... or, more precisely, the establishment of excess capacity for providing any product as a result of investment in two or more competing plants in two or more

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(1) U.S. Department of Commerce, Bureau of International Commerce: "The System of Regional Industries of Integration and United States Policy" Washington DC, 1968, p.1.

(2) See p.214 (of this chapter).

of the Central American countries". (1) To a very large extent, the whole process of import substitution behind tariffs, rather than specifically in a common market context, is responsible for this tendency to a wasteful proliferation of capacity: "the growth of several small-scale plants in a number of industrial activities, with consequent loss of economies of scale has been noted in both Latin America and Asia. In Latin America the growth of such inefficient enterprises has been both induced and maintained by high tariff walls which make profitable production at almost any scale possible. Besides, this phenomenon appears to have occurred in Latin America (in the automobile industry, for example) despite free entry, suggesting that most firms got into the act simultaneously and are consequently in an inefficient but stable equilibrium where none wishes to expand at the expense of the other since each can play at the same game". (2) Several case studies have been carried out of the extreme lengths of "duplication" in the Latin American car industry, especially in Chile. (3) Tavares writes of the seventeen firms in the Brazilian car industry that "their joint action on the market is actually para-monopolistic in terms of prices without any of the advantages of a monopoly in terms of costs." (4)

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(1) World Bank Report on Central America, Part IV, 1967, p.33.

(2) J.B. Bhagwati: "Trade policies for development" in P. Fei and G. Ranis: "The Gap between Rich and Poor Countries", p.257.

(3) L. Johnson: "Problems of import substitution in the Chilean automobile industry Economic Development and Cultural Changes". Jan. 1969, pp.202-216.

(4) M.C. Tavares: "The growth and decline of import substitution in Brazil" Economic Bulletin for Latin America, No.1, 1966, March, pp.9-10.

This happens because import substitution involves importers trying to jump the tariff by producing locally in order to defend a market share threatened by other local producers. (1) Johnston argues that, characteristically, investors "duplicate" the market structure and marketing methods of the advanced countries; high distribution margins, heavy advertising, extensive product differentiation, rapid product changes, which are made even more expensive in this context by the narrow markets and special tastes in luxury goods of the elite groups.(2) Furthermore, "the special deficiency of the competitive system makes it possible for enterprises with greatly differing productivity to coexist owing to tacit market sharing arrangements and to the fact that prices of the least efficient producers are supported by the high protective tariff".(3) Any "oligopoly" formed in this way will tend to be stable in the long term as the overseas subsidiaries accomodate each other, while maintaining formidable "barriers to entry" for any indigenous producer who wishes to enter the market. (4). And the attempt to explain this persistent tendency to proliferate small uneconomic producing units (especially in light industry) was made by Griffin. He suggests that it is due, in part, to the inability of the entrepreneurial class "to create investment opportunities ..

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(1) This process is described in detail in P. Kilby: "Industrialisation in an Open Economy: Nigeria, 1945-1966" Cambridge, 1969, Ch.3 and 11.

(2) H. Johnson: "Tariffs and Economic Development" Journal of Development Studies, 1964, p.24.

(3) U.N.C.T.A.D.: "Trade Expansion and Economic Integration among Developing Countries" op. cit. p.33.

(4) M. Merhav: "Technological Dependence, Monopoly and Growth" op. cit. Ch.2.

but instead is inclined to respond to obvious profit situations." (1) He also suggests that in the absence of adequate planning, industrial investment does not naturally gravitate to the more "difficult projects with important "linkage effects" and long term profits, but to superficially easier projects that protection is adequate to sufficient to ensure adequate profit. There is, thus, an implicit assumption of "satisficing" behaviour among local businessmen which together with the pressures of international business strategy amongst overseas investors, explains the inefficient industrial structure developing. However, there are optimists too, Mikesell sketches a scenario in which "the introduction of a new and, perhaps, more efficient plant may force down the price of the product. If the demand for the commodity is fairly elastic, the market might be able to absorb the output of several plants; or conceivably the less efficient firms might be forced out of business or at any rate, obliged to take steps to reduce their costs".(2)

We are faced with a persistent "identification problem". Are the inefficiencies identified the product of a regional common market, or of import-substituting industrialisation which would produce even greater inefficiencies if pursued nationally? Indeed, it could be argued that "there is no contradiction between the possibilities of reaping economies of scale and enjoying the advantage of intensified competition in an integrated area ... in sectors characterised by national monopolies, oligopoly will become the dominant market structure, while in oligopolistic industries the size of the group will increase". (2)

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(1) K. Griffin: "Underveloprment in Spanish America" London, 1969, pp.251-252.

(2) R. Mikesell: "The theory of common markets as applied to regional arrangements among developing countries" op. cit. p.220. (This is part of an argument questioning the value of a 'planning' approach in this context).

(3) B. Balassa: "The Theory of Economic Integration" op. cit. p.164.

Nevertheless, this is a phenomenon that mere market enlargement is unlikely to solve and may make worse: "it should be kept in mind that the (higher) common tariff .... may work in the opposite direction (i.e. encourage a less monopolistic structure) by offering greater opportunity for lucrative operation even though part of the installed capacity is not put to use. Thus, there is a danger that anti-economic forms of growth in industry will be transferred from the national to the (regional) Central American plane with the resultant waste of resources". (I) And by extending the degree of import substitution, the Common Market will extend the distortions associated with it.

It is clear from what has been said earlier that many of the examples of wasteful duplication do occur in industries which enjoy high effective protection, especially those in Central America promoted under the "Special Industries" Scheme. (2) Under the scheme, which guarantees tariff protection and a common market to industries which are "new" and "of particular interest", there is no attempt to control location, impose legal barriers to entry and there is no limit to the number of firms within an industry provided that each plant's capacity is half the size of the regional markets. Though the latter is an attempt to realise economics of scale, the clause is so permissive as to permit large scale duplication. The other factor which has aggravated the situation has been the policy of national governments who, "in their eagerness to attract foreign capital, have been vying with each other, each striving to offer tax benefits greater than its neighbours". (3) The existence of separate regimes of incentives interferes with the choice of location and timing of investment by creating a patronage relationship between government and 'client' investors: in Honduras, for example, local enterprises can obtain additional benefits if it could be shown that a similar enterprise in another Central American country is receiving larger exemptions. (4) If

(Footnotes on p214)

governments are prepared to subsidise inefficient duplication in this way, investors are likely to take advantage of it. The recently agreed Investment Incentives protocol has tried to curb this aspect of incentives by a provision that when an industry has been given tax exemption status, competing investments in the same country may receive similar benefits only during the unexpired portion of the original incentive period: after 1976, there will be limits on the ability to compete with designated projects in other countries. (5)

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(1) J. Moscarella: "Economic Integration in Central America" in M. Wionczek: "Latin American Economic Integration" op. cit. p.278.

(2) The special ('etaneo') system for the promotion of production was introduced in Jan. 1963 in the first Protocol (San Salvador) to the Convention of Integration Industries, and became effective in Feb, 1965, except in Honduras. Due to the speed of operation of the System and of the simple procedures, 14 industries were approved in the first four years of operation.

(3) C. Joel: "Tax Incentives in Central American Development" Economic Development and Cultural Change, 1971, p.233.

(4) World Bank Survey of Central American Economies (Industry) op. cit. p. 28.

(5) C. Joel: ibid p.248.

We have shown in Chapter 3, that in many industries, the Central American Common Market had led to (presumably healthy) price competition making the tariff irrelevant. However, what evidence is there of the kind of wasteful competition described above, using tariffs and incentives (i.e. effective protection) to disguise inefficiency?

This problem of duplication varies in cause and effect depending on what type of industry we are discussing.

(i) Consumer Goods. If we concern ourselves firstly with consumer goods, especially consumer durables, the problem of duplication arises partly because of the nature of competition between the major international companies as well as the existence of restrictive practices between local operators. The former in particular are willing to accept inefficiency as the prices of retaining a market share and preventing the expansion of rivals, and both may well be enabled by generous protection to make substantial profits.

There is considerable evidence to suggest that waste of capital has taken place in the detergent industry. After the establishment of a small factory making laundry detergent in Guatemala in 1956 (using one third of the Guatemalan market) there was in the early nineteen-sixties "a flurry of new activities which ultimately resulted in the introduction of several new brands and the construction of six additional detergent factories" - later in 1966, two more were added. (1) According to industry executives," the major impetus to this new development came from the formation of the Central American Common Market coupled with the offer of attractive investment incentives by the governments of each of the countries comprising the CACM". (2)

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(1) Harvard Business School (cases): "Note on the Central American Detergent Industry", 1965, "Colgate-Palmolive International" A-B-C-, 1966, and "Kativo Chemicals Detergent, U.S." C. 1963.

(2) "Note on the Central American Detergent Industry" op. cit. p.3.

Once established, these seven plants competed but avoided overt price competition, "feeling that once started it might lead to a price war which would be disastrous to everyone involved. Instead, they preferred to rely on indirect competitive pricing tactics such as offering retailers both credit facilities, larger cash discounts, free promotional merchandise, or changing the size of the detergent containers."(1) As a result of brand competition, advertising was adding 10-15% to net sales value.

The effect of non-price competition was to duplicate the costs of "spray tower" installations which do enjoy some economies of scale ($200,000 fixed investment for a 1,200,000 kg annual capacity unit: $300,000 for a 3,000,000 kg unit) and to produce considerable waste capacity as production of the prepackaged spray towers is standardised and not offered at less than the 1,200,000 kg capacity. Therefore, for the Central American Market of 4,350,000 kg in 1964 (circa 5 million Kg in 1966) there were the following plants:

Brand	Date Opened	Company	Location	One shift capacity
Superdet	1956	Industia Quimica (local)	Guatemala	1.2 m kg
Terso	1961	King Hermanos (local)	Guatemala	1.2 m kg
	(also contract supplier to regional market except Costa Rica for Colgate-Palmolive)			
Prim	1962 (destroyed by Volcano 1963)	Kativo S A (local)	Costa Rica	1.2 m kg
Fab	1963	Colgate-Palmolive (US)	Costa Rica	.9 m kg
Prim	1963	Renisa (Kativo-local)	Nicaragua	1.0 m kg
Tide/Ace	1963 (also contract supplier for Proctor and Gable)	Quimicas Dinart (local)	Honduras	3.0 m kg
Rinso	1964	Unisola (50% Unilever)	El Salvador	2.6 m kg

Note: [illegible] of the total sales; 25% were of local brands and 75% of the three big international companies (Unilever, Colgat-Palmolive, Proctor and Gamble.

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(1) Ibid, p.9.

As a result, only 40% of capacity was used in 1964 and about the same in 1966: while the gross investment cost is very much greater than it could have been, with fewer plants. The causes and effects of this wastage are explained by a local area-manager: "it is relatively easy for anyone with about $200,000 to buy a prepackaged detergent plant and the technology necessary to operate it. That's one of the reasons why eight detergent plants have already been constructed in the CACM when one or two could easily produce enough detergent to supply the needs of the whole area. With so much over capacity it is easy to see that what really counts is not the ability to make detergent but rather the ability to market them effectively."(1) Another facet of corporate strategy in this area is for each firm or plant to diversify output into a general product line; Colgate into soap and tooth-pastes; Unisola into margarine and dried soups, dissipating even further possible gains from volume production and specialisation.

A slightly less spectacular case but, nevertheless, a significant one is the case of the glass bulbs and fluorescent tube industry where two plants have been established both having Special Industries status. Both Sylvania (the Costa Rican subsidiary of General Telephones and Electronics) and INPELCA (El Salvadorian subsidiary of Phillips) are assembling fluorescent tubes in the region, and both are producing substitutable lines with the reservation that Sylvania have an increasing output of the more luminous bulbs.(2) In this industry the 1969 capacity was three times greater than a maximum estimate of the regional market measured by imports and assuming 100% import

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(1) Case Study of Colgate-Palmolive, op.cit. p.9.

(2) SIECA: "Estimate of demand in relation to installed capacity of Sylvania and INPELCA" SIECA/SEPAP/D.1 3-69. Guatemala.

substitution; total capacity was six times greater than the minimum estimate of the market. The fact that the tariff required for the industry is over 100% is at least partially due to the enormous excess capacity in the industry.

Another industry with three producers (in 1966; now four) is the dry-cell battery industry, the production and assembly of which normally requires considerable fixed costs expenditure.(1) Over $2m. had been invested in the industry by 1967, in three plants (with another to follow) of which Duralux (Guatemala) - an ESB subsidiary - was dominant and Union Carbide (Costa Rica) was substantial. The Duralux subsidiary with 225 million units capacity was operating at 33% capacity, the other two at substantially less than 10% of capacity. There was also very little scope for further import substitution and not unsurprisingly, the situation has led to requests for substantial tariff increases.(2)

The paint industry is generally regarded in Central America as a healthy competitive industry working reasonably close to capacity,(3) but in 1965 there were 9 or 10 plants each producing a full quality range, mostly in competition for the 3 million gallon market and for the most part, established post - 1960 by international companies to protect their markets previously fed through imports (e.g. California Paints Co; Hathaway Paint Co; Standard Paint Co; Excello Co. and Regent). Paint production does enjoy economies of scale in the lower range of sizes and the number may well be in excess of that required to supply the region efficiently and at the least investment cost.

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(1) SIECA Document SIECA/CE - XXX/DT.18 (1967) - A request for "special industries" status.

(2) SIECA Document SIECA/CE - V1/DT3 (1965) - A request for a higher tariff.

(3) Harvard Business School (cases): "Note on the Central American Paint Industry" 1965,1CH 13G 26B.

There are other cases too. As indicated earlier, an obvious solution would be to reduce the rate of effective protection, and this can be expected to happen when incentives expire in several years time for many industries. This would result in bankruptcy for the marginal enterprises and perhaps rationalisation of intramarginal firms. However, in some cases some form of industrial licensing would be preferred (or added) and for rationalisation to be supervised by an official Common Market body. To lower protection to existing enterprises could well lead merely to an increase in imports, with marginal firms becoming bankrupt and intra-marginal firms being forced by the new competition to operate at even lower rates of capacity use and lower efficiency, at least in the short run.

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1. In the last few years five gramophone record plants have been set up in Guatemala, El Salvador, Costa Rica and Nicaragua, all competing and all operating at low rates of capacity usage.* There are several other industries in which economies of scale may be of some importance and which have attracted factories from the major U.S. brand names, e.g. Cosmetics (Revlon, Helena Rubenstein, 4711, Old Spice) mostly in Guatemala; pharmaceuticals (Willy, M.K. Hoffner, La Roche, Abbot, Dohme and Pfizer, Merck Sharp); ladies stockings and underwear ("Loveable", Maiden Form, Form-fit, Kayser). In all these cases one cannot be dogmatic about the cost from "over-investment" but it is clear that investment is largely motivated by the desire of foreign (mostly U.S.) suppliers to protect their part of the narrow Central American Market, and has resulted in a very inefficient use of capacity.

* Banco Central de Costa Rica (Dept. de Estudios Economicos): "Analysis de los principales rubros del comercio centroamericano" 1968, p.3.

It was factors of this kind which guided the Central American governments when they reached a joint agreement on the planning of the textile industry. The inherited situation at the inception of the Common Market was highly unsatisfactory. Only 60% of the Central American demand was satisfied locally, but yet existing supply was seriously under-utilised. The main problem was that "there exists no coordination whatever in the textile industry" .... "new factories and expansions of old ones are planned in several countries. This will not solve the problems of those now operating at less than full capacity or with a low productivity. Lack of integration is one of the reasons for the duplication of investment and inadequate utilisation of investment, but the prospect of vast over-investment is likely to become a burden rather than an asset to the companies of the Central American countries".(1)

Faced with this situation, a report on the regional industry was commissioned,(2) and this was followed up by a series of regional conferences.(3)

The main conclusions which emerged from the report and conferences was that some restriction was required on new investment in spinning and weaving capacity, rather than greater "competition".

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(1) B.F. Hoselitz: "Economic Development in Central America" Weltwirtschaftlichesarchiv, 1956, p.208.

(2) Mission Conjunta de Programacion para Cnetroamericana: "Programa de desarrollo de la industria textil de hilados y tejidos planos de algodon" Guatemala, 1964.

(3) SIECA (Report No. 1-324-A): "Informe de la reunion de la primera conferencia textil Centroamericano" and SIECA/CE XXX DT27, Guatemala 1966.

(1) [illegible].

As far as can be seen, this approach to the problem of the textile industry has been relatively successful and despite the high (and increased) tariff there is price-competitiveness with overseas suppliers in export markets. The same 'planning' approach would be, in all probability, more productive than merely to reduce protection in most industries with comparable problems.

(ii) Intermediate and Capital Goods

Different considerations apply here since economies of scale through indivisibilities are very considerable, such that for many chemical and basic metal projects the regional market could only support one efficient project, and also, because lead-times are long and uncertainty in the pre-investment period can lead to postponement and delay in investment.

Thus the absence of a regional investment policy is important because, first, unrestricted competition could lead (and has led in Central America) to a situation where uncertainty over the intentions of other governments and potential investors causes the shelving of major investments: Second, if 'competitive' investments are undertaken at separate locations, then the costs in terms of under-utilised scarce resources, or unused economies of scale, could be very considerable.

There are several examples of duplication having taken place. The case of oil refining is sufficiently important to merit a special case study (Appendix) as it is one of the few industries yet established where there were really major gains to be obtained from economies of scale, and was one of those which were used in the 1950's to justify the "fationale" for integration. (1)

(1) United Nations (ECLA): "Possibilidades de Desarroldo Industrial Integrado, en Centroamerica" New York, 1965, pp.33-48.

In actual fact, the industry has developed on the basis of national refineries and the corporate strategy of the major multinationals combined with the reluctance of local governments to co-operate, has led to six refineries being established:"while the desire of each of the five governments to have a refinery located within its boundaries has played a fundemental role in the development, it must be recognised that the different foreign oil companies undertook the investment involved with a view to insure their continuing presence and operations in the area". (1)

Another case which merits a special case study is cement. "National" production units have been maintained under free trade despite the significant economies of scale in the production process. Transportation costs are normally used to explain this but the considerable excess capacity in the industry can be explained in good part by lack of coordination (Appendix Case Study).

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(1) World Bank Report (Industry) op. cit. p.35.

The first industry to be considered for Integrated Industries status was tyre production and more particularly, the GINSA tyre factory in Guatemala. This had been in operation since 1957 and obtained full I-I status in all major countries in 1965, whereupon, it doubled its sales in two years. One of the more persistent problems has been the fact that while in some respects the company is expected to operate as a regional supplier, to maintain stocks in all five countries, and to base its capacity on the regional market, it has had been unable to use its capacity to the maximum possible.(1) The regional market was believed to be 480,000 tyres in 1970 and 335,000 in 1966.(2) But in 1966 capacity usage was about 60% with production of 188,000 tyres and capacity of 300,000 tyres.(3) Part of the problem has been due to competition from another plant (FIRESTONE) in Costa Rica which operates outwith the I-I scheme but nevertheless, has taken the Costa Rican market and as the I-I protection falls annually, Firestone is taking a greater proportion of the Nicaraguan and other markets.

Soldered steel tubes is another industry in which it was felt at the beginning of the ninoteeen sixties, one regional producer would be adequate for the small diameter range as part of an integrated steel industry.(4) In practice, three plants have been established: METASA (US Steel) in Nicaragua and INTUPERSE in Guatemala were set up first of all and recently a Costa Rican plant has started substituting the products of the other two plants. There is

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(1) [illegible]., D. Ramsett: "Regional Industrial Development" op.cit.

(2) Firestone Co. Estimate (interview in Costa Rica).

(3) It is bound by protocol to produce 225,000 tyres (Article XXII of 1st Protocol) and extensions from a 120,000 capacity were carried out in 1966, followed by further extensions.

(4) United Nations (ECLA): "Possibilidades de desarrollo industrial integrado en Centroamerica" [illegible] op.cit, pp.9-13.

serious under-utilisation of capacity in the industry (METASA 30% in 1965-6 of its 15000MT capacity for making ⅛" to 4" tubes). The entry of an INTUPERSE (capacity 7,000 MT) removed 10-15% of METASA's sales in the Guatemalan market. Fixed costs are heavy in this industry ($2m. in METASA) and the under-utilisation of capacity has given rise to financial problems and a demand for tariff increases.(1) In the flat galvanised sheet business there are eight serious projects being considered for a 40,000 MT market, four already under construction, and as a consequence necessary effective protection is very high.

There are several other industries where governments have planned competitive installations which have not yet been established. Fears of excessive investment in production facilities were largely derived from the 1964-69 Development Plans. "If all the projects considered in the plans and by the development institutions were fulfilled, by 1969-74 there would be considerable excess capacity for certain products and a lack of capacity for others ... many of the installations are relatively small and in all countries there are plans to establish or to expand factories in the same types of industry." (2) For this reason the Plans were heavily criticised: "it is evident that the national plans that have been prepared so far do not contain specific elements directly designed to drive the process of specialisation of the productive facilities, nor for the same do they lead to a systematic use of the potentialities of the Common Market." (3) In order

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(1) SIECA: "Solicitudes de los gobiernos para renegociar gravamenes a la importacion equiparados" SIECA/CE XXIII/DTS Guatemala.

(2) Pan American Union: "Report on the Central America National Development Plans and the Process of Economic Integration" August 1966, p.27 (also pp.87-88).

(3) Ibid p.26.

to demonstrate the potential effects of this lack of co-ordination, Diag.4-2 sets out the situation as regards those products where the effects are potentially most serious.

Two significant points emerge. The first is that in the absence of adequate co-ordination there are many cases where, had planning targets been adhered to there would have been gross excess capacity and many plants of small size in industries that are very scale sensitive. The second is that the extreme inadequacy of the national planning exercise was such that it lumped together projects totally failing to take into account the stage of development of the projects contained; many of them being little more than hopeful ideas unsupported by technical, financial or economic data. The "lead-time" in many industrial projects, especially where local raw materials are involved, and technical obstacles have to be overcome, is very considerable. The effect of national competition for the ultimate siting of these major and valuable projects is to hinder them, as prospective investors are unsure as to the ultimate size of the regional market: "one is led to the conclusion that uncertainty resulting from existence of national competition in the granting of incentives has tended more to hinder new investment than to encourage duplication".(1) The major issue, therefore, is the adoption of policies which would provide the necessary elements of control over the inevitable monopolistic situation which results from the establishment of large plant, and to ensure that there is a sufficient degree of joint planning to prevent competing industrial promotion with its consequence of creating uncertainty, as well as the waste of time and resources in the pre-investment phase.

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(1) World Bank Report (Industry) pp.35-36. Interviews with managers of currently established 'regional' enterprises (caustic soda, PVC, tyres and others) convinced the author that this was a real fear and had retarded both new plants and expansion.

Diagram 4-2 Planned Industrial Projects

Product	Demand - Projected	Projects Planned Nationally (1964-69)	Present Situation
Iron and Steel	For billet steel (for shapes) 1969: 140,000 tons 1974: 235,000 tons	Honduras: minimum of 100,000 tons of billet steel from magnetite	Very long term. Modified proposals for 60,000 tons
		Costa Rica: minimum of 100,000 tons of billet steel from titaniferous sands.	Not recently discussed
Plate glass and containers	1969: 21,000 MT containers 1974: 33,000 " "	Honduras: 6,100 MT plate glass (2-6mm) (possibly 9,200 MT)	Serious problems due to excess of iron in glass. Long term if at all.
	1969: 10,800 plate glass 1974: 16,000 " "	El Salvador: 9,000 MT containers (16,000 MT in 1970-74)	Plant closed
		Costa Rica : 8,000 MT plate glass (2-4mm) and 6,000 MT containers	Only coloured glass possible.
		Already exists VICASA - Guatemala in 1964: 12,000 T of containers	Increased to 22,000 MT and then to 30,000 MT.
Ammonia	1969: 110,000 MT 1974: 220,000 MT	El Salvador: 100,000 MT Guatemala : 100,000 MT Costa Rica : 18,000 MT (IQAITI report subsequently recommended) a 180,000 MT plant for Honduras	No action taken in any country.
Caustic Soda	1969: 13,700 MT 1974: 19,000 MT	Nicaragua : (12,000 MT planned)	Established 1968/69 at 10,000 MT
		Guatemala: 5,000 MT (as a 1974 possible extension to a viscose rayon plant)	No action
		El Slavador: 8,000 MT (as part of PVC complex)	Being considered
		Costa Rica: 12,000 MT (and insecticides) (subsequent idea of a 50,000 MT plant to accompany alumina plant)	Insurmountable problems of chlorine disposal.

Polyethylene - PVC	1974: MT (PVC) 1974: 18,300 MT(Polyethylene)	El Salvador: 3,400 MT PVC	No project
		Nicaragua: (PVC, Polyethylene)	7,000 MT PVC resin
		Costa Rica: 5,000/7,000 MT PVC 7,000/9,000 MT Polyethylene	No project
Viscose Rayon	1969: 3,000 MT 1974: 3,800 MT	Nicaragua) Costa Rica) : 8,000 MT in total Guatemala)	No action
Pulp and Paper	(Pulp of all kinds) 1969: 70,000 MT 1974: 120,000 MT (alternative estimates 163,000 MT 220,000 MT)	Guatemala: 100,000 MT (60,000 Linerboard 30,000 corrugated medium 10,000 Kraft)	No action
		El Salvador: 11,000 MT (Kraft and corrugated medium)	
		Nicaragua: 40,000 MT (for writing & toilet paper)	Implementation phase
		and 100,000 MT (for export from Atlantic coast)	No action
		Costa Rica: 18,000 MT (Kraft and corrugated medium)	
		and 50,000 MT (Kraft liner and corrugated medium)	No action
		Honduras: 170,000 MT ((Linerboard)	Project due to start 1972; then postponed indefinitely.

Tinbergen has argued, "assuming that an optimum pattern of heavy industry can be more or less estimated ... can it be expected that this pattern will automatically come into existence ...? It would seem doubtful. The first reason for doubting the effectiveness of a regime of free entrance to these industries is the relatively long construction period of the industrial projects. This invalidates the accuracy of the market mechanism ... (since prices are artificially high in the construction period and other firms enter to duplicate the production). The second reason to doubt the effectiveness of a regime of free investment is the existence of indivisibilities ... The third reason ... concerns the important question of location (due to externalities in certain places.)" (1)

An attempt has been made to justify in principle, a regional investment policy in order to prevent the wasteful use of scarce capital. The measures to be applied could cover a whole range of policies from strict multinational licensing to incentives and voluntary agreements; and also require parallel measures to prevent any abuse of monopoly power. But in any circumstances "the real choice ... lies between spontaneous monopolies and oligopolies on one hand and monopolies and oligopolies controlled by Union authorities on the other." (2)

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(1) J. Tinbergen: "Heavy Industry in the Latin American Common Market" Economic Bulletin for Latin America, March, 1960, pp.1-8.

(2) M. Wionczek: "Requisites for Viable Integration" in Wionczek (Ed.) "Latin American Economic Integration" op. cit. p.10

II Unequal Distribution of Benefits

In Ch. 3 it was shown that within Central America the distribution of gains was such as to offer least benefit to the initially poorest partner, Honduras. This process occurs in all geographical areas where there is industrialisation under largely laissez-faire conditions: "historical and recent experience both within countries (for instance Brazil and Italy) and within integrated groups of countries (for instance East Africa) strongly indicates that in the absence of measures to counteract the natural trend of market forces, the disparities between the more advanced and the less advanced developing countries within a unified regional market would, in all probability, become more pronounced." (1) There is a good deal of evidence to suggest that industrialisation in Latin American has led to spatial polarisation within and between countries; (2) and that this is a characteristic feature of developing even more than of mature economies. (3)

As far as common markets are concerned, several have produced evidence of unequally distributed benefits apart from Central America. In East Africa, for example, the Common Market was disrupted in 1965 by disputes over benefits despite the existence of a distributive pool for customs duty and an industry sharing arrangement. (4) Authorities are divided as to whether Tanzania and Uganda, the least industrialised partners, lost in absolute or merely relative

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(1) UNCTAD: "Trade Expansion and Economic Integration Among Developing Countries" op. cit. p.20.

(2) P. Odell: "Economic Integration and the Spatial Problems of Economic Development in Latin America" Journal of Common Market Studies, Vol. 6, 1967/8 pp. 262-286.

(3) J.G. Williamson: "Regional inequality and the process of national development" Economic Development & Cultural Change, 1965.

(4) See (inter alia) P. Robson: "Economic Integration in Africa" op. cit. Ch.4. Earlier signs of strain were evident: T. Kennedy: "The East African Economic Union: some features of its history and operation" Makerere Journal 1959.

(to Kenya) terms from membership. (1) The 1967 Treaty for East African Corporation incorporated (Article 2) an explicit commitment to "harmonious and balanced development and sustained expansion of economic activities, the benefit whereof shall be equitably shared". The Central African Customs Union(UDEAC) there was a considerable disparity in initial levels of industrialisation and income per head (Gabon and Congo (Br.) being much better placed than Chad or the CAR; with Cameroon being both larger and poorer than the rest): again, despite an element of fiscal re-distribution and industrial co-ordination there has been continuing tension between members with threats of withdrawal from the 'interior' and less developed members. (2) The West African Customs Union was never able to overcome the suspicion of the 'interior' and more backward states (like Upper Volta) have, that industrial development would polarise towards the coastal and more advanced cities in Senegal and Ivory Coast. (3) The Central African Federation disintegrated, at least in part, due to the effect which it had on the economic performance of Nyasaland. (4) While the other groupings have not existed long enough for cumulative disequilibrium effects to become apparent, they have been very careful to specify some form of 'balanced growth' commitment. (5) The rationale, then, for some

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(1) The former view, (gain from withdrawal) is taken by D. Ghai: "Territorial distribution of the benefits and costs of the East African Common Market" op. cit. W. Newlyn: "Gains and losses in the East African Common Market" op. cit. A more qualified view is taken in the works of Hazelwood, Robson, Brown and others, quoted elsewhere.

(2) B. Mutharika: "Toward Multi-national Economic Co-operation in Africa" Praeger, 1972, pp.279-286.

(3) B. Mutharika: ibid. pp.286-294.

(4) A. Hazelwood: "African Integration and Disintegration" op. cit. Ch.

(5) E.g. the Andean Group are committed to reduce differences between member countries (Acuardo de Integracion Subregional Andino (1969)) and the CARIFTA group is committed to an "equal" distribution of the benefits of free trade (Article 2 of the Agreement 1968). A major obstacle to the continuing development of LAFTA were differences in income levels between members and the possibility of these widening. W. Krauss & J. Mathis: "Latin America and Economic Integration" Iowa, 1970.

form of intervention to ensure an acceptable distribution of proceeds is quite simply that "the tendency for an automatic process of income equalisation is very weak." (1)

How is this problem to be solved? It is probably more difficult than amongst developed economies since the scope for transferring resources and making sacrifices is less; and as the disparities in income between regions and social classes is likely to be so much greater than that between partner states, that political priority may be lacking for the will to make concessions. It can also be argued that unequal development must be tolerated to enable the accumulation of inevitable surpluses. We shall, however, review the various methods that can and have been applied to maintain a satisfactory equilibrium, (2)

(a) a regional investment policy, i.e. control over industrial location, by licensing and restriction, either on a piecemeal basis or part of a comprehensive planning effort.

(b) fiscal compensation for the disadvantaged partners.

(c) export subsidies.

(d) restrictions on regional free trade

It is not self evident that a regional investment policy is either necessary or sufficient given other policy options. To what extent can the other policies be seen as alternatives?

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(1) M.C. Bos: "The Spatial Dispersion of Economic Activity" Rotterdam, 1964, p.3.

(2) This is an oversimplification. No mention is to be made, for example, of the use of complex exchange rate regimes. In general see UNCTAD: "Trade Expansion and Economic Integration among Developing Countries" New York, 1967.

(i) Fiscal Compensation: the attraction of fiscal compensation is that "it is possible to avoid the difficulties of an investment policy along the compensation principle of welfare economies" ... "the creation of a compensation fund with all its difficulties should be far simpler than the creation of an efficient planning machinery". (1) The use of fiscal compensation has been detailed elsewhere and requires only a short precis. The standard function of fiscal compensation is explained by Newlyn: "vigorous industrialisation policy will only be achieved on an area basis if there is complete fiscal integration ... The area government must control the fiscal machinery to the extent of being able to effect inter-unit transfers ... The industrialisation unit should compensate the other units by a direct fiscal payment for the loss of import duty resulting from import substitution". (2) This is economically justified in as much as the loss represents the "excess cost" in real income terms of the partners' imports (assuming away "water in the tariff") rather than direct revenue loss. Such a criteria was applied in the Central African Federation, (3) and was a large component of the national loss deemed to be compensated by the "distributable pool" in East Africa, though in the latter case, the "redistribution" from Kenya (variously calculated at £.5m to £1.1m p.a. in 1964/5) was widely regarded as inadequate, and not commensurate with the revenue losses of Tanzania and Uganda. (4)

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(1) A. Roddan : "Economic Integration in Latin America, its Benefits and Obstacles" in R. Hilton: "Economic Integration ..." op. cit. p.89.

(2) W. Newlyn: "The role of monetary and fiscal policy" in U. Hicks: "Federation and Economic Gorwth in Underdeveloped Countries" New York, 1967, pp.90 and 100.

(3) The Federation involved, however, distribution mainly from Zambia not Rhodesia.

(4) The "pool" consisted of 6% of all commonly collected customs duty and 40% of commonly collected company income tax. One half of the fund was allocated to common services and the other half to distribution.

The UDEAC scheme incorporated two elements of fiscal compensation. One was a Solidarity Fund which comprised 20% of common duties and was given almost entirely to Chad and CAR, though sums were not large even after 1966 when the new Treaty was effective. (1) A second instrument was the "tax unique" which was an excise tax on products sold in the regional market and credited to the consuming country. However, it has been argued that the device is "primarily to be considered as a means of restoring the domestic tax base, rather than as a means of providing fiscal compensation for the cost of integration." (2)

There are other arrangements which involve some degree of financial compensation as a subsidiary aspect of their operations, for example, in regional investment banks. In East Africa, for example, the contribution and receipt patterns of the Bank enable some redistribution to occur: loan allocations are made on a 38¾%: 38¾%: 22½% basis, (Kenya having the 22½%), while contributions are equal. (3) The Central American Integration Bank operates on similar if less formal criteria. However, this form of calculation does not compensate for income losses, particularly in respect of the loss for "shiftable" industries; and, indeed, it would be very difficult to do so since full compensation for this might involve the exporter nation paying more in compensation than it derives in benefits. Also the importer may well regard economic activity loss as not measurably solely in financial terms.

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(1) UNCTAD "Current problems of economic integration" (Peter Robson) 1971, p.34.

(2) Ibid. p.32.

(3) After 1967, there was also Central collection of revenue (20% of income tax and 3% of import duty) for a central fund to finance common services which were redistributed more equally.

Thus it is difficult to see how fiscal redistribution could be used for any other purpose than offsetting import duty losses and it must necessarily be, therefore, only a subsidiary element in any settlement. It has, however, a useful part to play and is blessed with the virtue of simplicity once magnitudes have been agreed, assuming that a common customs collection and tax policy is in existence (which it is not, in Central America).

The inability of fiscal compensation to deal with "backwash" effects has led to suggestions that restrictions of regional trade be permitted.

(ii) Trade restrictions are one way of protecting the interests of the weaker partners, by permitting quotas and tariffs on intra-regional trade. This cuts right against the traditional case for customs unions which is to maximise the degree of free trade and equally is inconsistent with the GATT terms of admissability of customs unions which is only when there is complete internal free trade. However, if the argument is accepted that integration is a mechanism for reducing the cost of new industry, given "industry-preference" in all countries, then free trade is irrelevant in these industries in which the "industry preference" of all countries is not satisfied. Thus the view arose in East African that "shiftable" industries which did not need any more than national markets, should be produced in national markets, protected if necessary: and in East Africa tariffs (or "transfer taxes") are permitted up to 50% of the external tariff, - for revenue as well as protective reasons - on those products in which Tanzania and Uganda run a deficit with Kenya, as long as these countries are no less than 20% out of overall trade balance and provided that the product are not of "regional" industries (in East Africa the tax could be seen, in a sense, as trade liberalising as it replaced restrictive quotas). (1) Something analagous

(1) Prior to the "transfer tax", quotas were permitted on regional trade under the Kampala Agreement.
A "liberal" principle behind the tax is also implied in the explicit 'infant industry' test. The tax is to disappear after eight years.

occurred in the West African Customs Union, where tariffs up to 50% of the external tariff were allowed on intra-regional trade. However, in this case there was no special bias to the less developed partners. The same principle applies somewhat more positively in LAFTA and the Andean group where trade restrictions are reduced proportionately more slowly in the transitional phase for those countries in South America, like Bolivia and Ecuador which would be unable to sustain competition with Argentina or Brazil, (though in both cases, a rigorous "infant-industry" approach is adopted and protection is strictly temporary).

One idea for ensuring full reciprocity is that of Elkan, who produced a "blue-print for an area of quantitatively and structurally balanced free trade" in which restrictions would be permitted when trade failed to balance (i.e. deviate from a balance by 20%) in sectors for which specialisation had not been planned.(1) This would operate through a failure to "drawback" customs duties on unbalanced intra-regional trade. However, excessive pedantry over the precise balancing of trade in the short term can be seriously misleading: industries induced by the common market may have an import-substituting or trade promoting role outwith the group (even for a deficit partner) and trade within the region may have marked differences in value added content and multiplier effects as well as being unpredictable. In practive also, little progress will be made towards integration when each partner is concerned only with narrow interpretations of reciprocity at each negotiating stage: Arab and LAFTA experience bears this out.

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(1) P. Elkan: "Blue-print for an area of quantitatively and structurally balanced free trade": Journal of Common Market Studies, Sept. 1966, see also,
P. Elkan: "How to beat backwash: the case for customs-drawback unions" Economic Journal, March, 1965.

However, more fundamentally, such measures are entirely negative and probably irrelevant since the individual states may well do better by total withdrawal, unless the restraints on trade are part of a total package involving agreement on the location of industries based on the regional market. Only if measures are taken to help the weaker partner expand its regional exports will the source of friction be removed. (1) Also as in East Africa, the definition of a "regional industry" must necessarily be vague and industries enjoying economies of scale could easily be inhibited or precluded by "transfer taxes". (2)

(iii) Subsidies: Fiscal compensation cannot effectively deal with "backwash": trade restrictions can, but only by constricting the integration process. Neither mechanism greatly helps to promote regional exports, especially of firms using the regional market, indeed, they raise both fiscal and tariff disincentives to the more successful partners to expand regional sales.

This has led to the suggestion that the exports of the less advanced partners be subsidised to the extent that is necessary to displace some potential production from other partners (or preferably attract additional activity from outside). (3) This would be most likely to be linked to fiscal compensation in as much as the fiscal transfers were used for subsidising regional exports.

While the use of export subsidies is more trade-expansionary then restrictions on regional trade, it does face serious practical questions.

(1) R. Bhambri: "Customs unions and less developed countries" Economia Internazionale, May 1962, pp.235-58.

(2) G.K. Helleiner: "Transfer taxes, tariffs and the East African Common Market" East African Economic Review 1967, pp.53-61. An example of a failure to develop a proper regional base for industries due in part to "transfer taxes" is tyres.

(3) R. Bhambri: ibid.

First, is the subsidy arrangement to be financed by fiscal compensation or by the exporter country (as, for example, in the Central American Fiscal Incentives System)? The latter would have very limited attractions for the backward country. Second, is the subsidy applied to regional exports only or to all the production of designated plants? The latter would lead to heavy costs and possibly abuse, the former to price discrimination. Third, we know from experiences elsewhere that it is not possible to influence investment decisions by small differences in tax rates and that as many of the advantages enjoyed by the favoured locations are 'external' to the firm it would be extremely difficult to quantify precisely the cost disadvantage of the less favoured locations. (1)

If this is the case then another way of making investment in the lagging areas more attractive is by improving the infrastructure (transport by road or rail, telecommunications energy supply, industrial training) in these areas weakest, such as Honduras in Central America, Tanzania in East Africa, Chad/C.A.R. in UDEAC and Paraguay/Bolivia in LAFTA, and for the better placed partners to help finance this. (2) Also, if the volume of intra-regional trade were great as a proportion of the total then currency devaluation would have the same effect as an export subsidy combined with a tariff (in intra-regional trade). This may be directly relevant for those cases where high labour costs are one of the main obstacles to successful trade as possibly with Costa Rica, which did in fact try a policy of multiple exchange rates, but which was prevented from devaluing against its partners

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(1) Clark Joel: "Tax incentives in Central American development" op. cit.

(2) One might also mention that in East Africa the dissatisfaction of Tanzania and Uganda with the East African group was partly met by decentralising common service institutions from Nairobi; and in Central America efforts were made to ensure that Honduras had some share in the administrative structure of the Common Market (in fact, the Regional Bank headquarters). However, there are certain economies of centralised decision making which might be lost in this way.

in 1968/69 on the grounds that this would be an obstacle to monetary integration as well as an unfair trading practice. The East African Economic Community almost disintegrated in 1971 when Tanzania and Kenya temporarily allowed their exchange rates to diverge (though this was quickly remedied).

The conclusions one would draw from a survey of alternative methods of dealing with the question of imbalance is that both fiscal compensation and restrictions on trade deal at best only with one aspect of gains and losses. Collectively financed export subsidies present serious practical problems. Furthermore, none of these approaches do anything very specific to induce the establishment of enterprises based on the regional market in the backward economies or indeed anywhere else. For these reasons attempts have been made to operate regional investment policies of various kinds. One researcher has gone further and tried to prove that in terms of 'industry preference' theory an investment policy is superior to the other alternatives,(1) but in practice a combination of regional investment policy and fiscal compensation (and possibly trade restrictions) is perhaps the best solution.

III Other Arguments for Regional Investment Policy

One argument for the regional planning of industrial development is quite simply the conventional argument for planning transplanted onto the regional plane; that in the absence of guidance or control, the wrong priorities will be established: "obviously there is a danger under a relative laissez-faire system of free trade ... (that projects) ... would be selected on rather a haphazard basis from the point of view of development .... . There is even a possibility that the industries established could conflict with the immediate priority needs of an area for industrial development." (2) And it is precisely industries of this type which Central

(1) R. Birmingham: "Inter-territorial Imbalance in Customs Unions and Developing Economies: Adjustment Mechanisms" PhD, 1967 (Pittsburg).

(2) S. Dell: in R. Hilton: (Ed.) "The Movement Towards Latin American Economic Integration" op. cit. p. 63.

America has tended to attract - "finishing touch" plants involving the assembly of cars, bottling of cosmetics, packing of fertilisers and insecticides. Of the effects of these industries Hanson has said: "it is ironic that a policy of import-substitution adopted in order to free underdeveloped countries from chronic balance of payments difficulties should exacerbate that very problem". (1) With no licensing of new investment, high tariffs and generous tax concessions on raw materials and imported machinery there is no incentive to develop industries based on local raw materials and importing technical know-how to the area. Instead, luxury goods are manufactured in small assembly units attracted by the regional markets, while "it would be better from the standpoint of development for the region to continue importing such luxury goods in the relatively limited quantities that would result from the imposition of a high tariff on finished goods instead of going into production itself and dissipating valuable exchange and capital resources". (2)

It might very well be argued that such distortions occur because of excessive and wrongly orientated systems of protection, which, for example, through duty drawbacks, offer no inducement to use local raw materials. If this is the case then tariff adjustments are required rather than government

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(1) R. Hansen: "Central America: Regional Integration and Economic Development" op. cit. pp.48-49.

(2) S. Dell: Ibid.

controls. It could be argued more positively, that this would not do anything to promote the formation of "growth points" or industries with the potentiality for developing linkages, forward and backward. (1) This is a problem outside of this thesis: suffice it to say that Italian and other experience raises questions as to the success of government sponsored (or any other) growth complex developments.(2) It is also crucial and frequently forgotten that the failure of regional markets such as Central America to develop in practice major 'building block' intermediate industries using local raw materials such as paper, iron and steel and glass, is more, due to technical difficulties rather than market size restrictions. (3) However, it is still probable that private initiative in pursuit of short term profit, may tend to lead to investment being overlooked in "high priority sectors" as defined by local plans and here a regional investment policy may become important in both an entrepreneurial sense and a promotional sense.

A regional investment policy might also be a means of ensuring that a proper balance between domestic and overseas capital is maintained, through regional supervision of investment, which, because of its character, is most unlikely to come spontaneously from domestic sources.

Regional Investment Policy-Previous Experience

A case for a regional investment policy has been made in qualified terms and as one part of a package as far as problems of 'duplication' and polarisation are concerned. This, in turn, implies a committment to 'planning' in the indsutrial sector. Skitovsky argues that whereas it

(1) K. Griffin: "Underdevelopment in Spanish America" op. cit.

(2) E.g. K. Allen: S. Holland (Ed.) in "The State as Entrepreneur" Weidenfeld & Nicolson, 1972 pp.165-182.

(3) H. Brewster & C. Thomas: "The Dynamics of West Indian Economic Integration" University of the West Indies, op. cit. Part I.

may not be permissible in the more "developed" economies it is here: "I feel that the case for the coordination of inter-related investment decisions is largely confined to the underdeveloped countries." (1) This "planned" formed of industrialisation can, alternatively, be controlled by mandatory assigment or inducement by incentive, or a combination of the two.

(a) the most direct way of dealing with the problem would be to abolish national licensing powers in those industries in which a regional market is of particular importance, and restricting free entry into the regional market. An example of this was the East African Industrial Licensing Ordnance. However, only 32 licences were allocated to regional industries in ten years (mostly in textiles but also steeldrums, glassware, metal windows) before Tanzania and Uganda refused to co-operate further because the system "became a means for preventing competition with plants already established in Kenya. In other words licensing became a means of arresting development in Tanzania and Uganda rather than promoting it." (2) The subsequent (1965) Kampala agreement tried to combine both licensing and restrictive functions. Agreement was reached on the allocation of certain industries to Uganda, nitrogenous fertilisers and bicycle assembly; to Kenya, glass bulbs and fluorescent tubes; to Tanzania, landrover assembly, tyres and tubes, radio assembly, and aluminium foil sheets; while several "regional" firms were instructed to delegate production of shoes, cigarettes and beer to a national level. However, the allocation agreement was part of a "package" involving trade quotas and methods to help Uganda and Tanganyika which ultimately proved unsatisfactory to all partners and the Kampala agreement was not implemented.

(1) T. Skitovsky: "Papers on Welfare and Growth" London, 1964, p.83.

(2) S. Dell: "Trade Blocks and Common Markets" op. cit. p.283.

One could also possibly classify under this head also the agreements reached between Iran, Pakistan and Turkey of the R.C.D. group, under which a substantial number of joint projects were being planned, and some are being implemented. (1) The advantage of multi-national licensing in this way is simplicity and directness: by allocating specific projects to specific locations the regional authority can attain the objectives of optimum scale and optimum location at the same time. The major defect of this approach is rigidity: it is claimed that negative controls would inhibit private investment which was not prepared to accept prescribed sites while giving no guarantee that projects would go ahead where allocated. (2) Another major problem is that by completely excluding market choice and replacing it with administrative control one needs some allocative framework within which to operate: "Channelling industry to an area where economic resources bring a lower return, results in inefficiency of resource use ... subsidising "lagging" sectors is a luxury underdeveloped countries cannot afford ...". (3) Massell's view is somewhat extreme and private operators probably ignore the diseconomies of agglomeration and long term factors, and exaggerate risk. However, there will be some inefficiency and if this is to be minimised, it fellows that there should be a framework of planning, "this measure, if short of a sophisticated planning discipline could prevent the displacement of the union towards it production possibility and utility frontiers. In the absence of careful planning there is no guarantee that such agreements would permit an efficient use of internal and external economies... The earmarking of industries would freeze the degree of monopoly, creating an atmosphere less favourable to undertake costly research to increase efficiency." (4)

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(1) See Ch. 2. These projects which are being implemented are; aluminium, banknote paper, jute mill, locomotives, wires and cables and ball bearings.

(2) E.g. B. Massell: "East African Economic Union: An Evaluation and Some Implications for Policy" Santa Monica; RAND, 1963.

(3) Ibid, pp.58-59.

(4) A. Roldan: "Economic Development in Latin America: its Benefits and Obstacles" in R. Hilton (Ed.): "The Movement Towards Latin American Unity" op. cit.

But, the weakness of previous national (let alone regional) planning has been clearly enough shown already and it may be that this is something for which "Latin America is ill-prepared either technically or politically ..." This dilemma is difficult to resolve, but has yet to be seriously confronted in Central America.

(b) The most permissive form of joint industrial policy would involve some form of joint consultation without commitment or control. Most of the regional arrangements agreed so far have a vague commitment to joint consultation: in East Africa and UDEAC there is an explicit commitment to discuss regional projects. (1) A very good example of this looser form of control is the use of regional development banks which are given guidelines but are otherwise left to operate on commercial or near-commercial criteria. In the East Africa case, redistributive bias was made explicit in the lending criteria but the Bank has only had a short history as yet.

The Central American Bank has been described in outline in Ch. 2. One of its main purposes has been to slant its investments towards Honduras and also to Nicaragua. In Diag. 4-3 an attempt is made to set out the status of loans made by CABEI from its inception in 1961 up to 1970, both in aggregate and by sector. It appears that in disbursements Honduras particularly, but also Nicaragua, has benefited slightly from such a process of active diversion, especially in respect of loans for roads and infrastructure. However, such a contrast is superficial and the actual 'diversion' of resources can only be estimated by contrasting flows of lending from the flows which have existed had they been proportional to GNP or to the actual flows of aid to the five countries which gives an indication of where external finance might have flowed in the absence of a Common Market. In Ch. 3 it

(1) B. Mutharika: "Towards Multinational Economic Co-operation in Africa" op. cit. p.275 and p.282.

Diag. 4-3 Loans Authorised Annually to Central American Countries from the Central American Integration Bank 1961-70 ($m)

	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Central America
1961	6.1	9.7	5.3	3.7	2.0	26.8
1962	8.5	6.1	8.8	9.5	7.7	40.6
1963	1.1	-	5.7	3.7	0.2	10.7
1964	9.0	4.4	3.3	0.6	16.7	34.0
1965	10.7	12.0	-	10.5	15.5	48.7
1966	0.4	-	16.3	9.7	8.3	34.7
1967	1.4	-	6.0	7.5	-	14.9
1968	-	3.0	-	2.8	7.2	13.0
1969	10.0	10.3	34.5	7.7	7.4	69.9
1970	15.6	3.8	-	-	12.4	31.8
	52.8	49.3	79.9	55.7	77.4	325.1

Loans disbursed and approved up to end 1968 (and by sector)

	Approved	Disbursed	Disbursed to Industry	Infrastructure	Housing
Costa Rica	37.2	23.9	7.1	14.8	2.0
El Salvador	35.2	28.3	12.6	13.7	2.0
Guatemala	45.4	27.5	8.8	16.4	2.25
Honduras	48.0	34.5	9.3	23.5	1.75
Nicaragua	57.6	33.6	14.7	16.9	2.0
	223.4	147.8	52.8	85.3	10.0

Industrial Loans Disbursed by Industrial Group up to end 1968 ($m)

	Number	Value
Food etc.	22	7.28
Drink	-	
Tobacco	-	
Textiles	25	16.76
Clothes	6	1.8
Timber	3	.33
Furniture	4	.97
Printing	4	.6
"Others"	13	1.6
Leather	2	.16
Paper	2	1.33
Rubber	-	-
Chemicals	14	4.93
Non-metal min.	12	6.75
Basic Metals	8	4.27
Metal Prod.	9	.97
Transport Eng.	1	.2
Elect. Eng.	4.	.2

Others: two to mining ($ .2m)
ten to personnel services($2.77m)
two to industrial promotion bodies ($1.35m)

Sources: SIECA, Indicatores Economicos Centroamericano Aug. 1969, Nos. 6 & 7, also Carta Informativa No. 116, June 1971.

was shown that, on average, Honduras was receiving $2m p.a. more than if the same aid had gone in proportion to recipient GNP, and Nicaragua $1.5m. However, it is doubtful if anyone "loses" in absolute terms as the Bank is financed by specific and probably irreplaceable aid. The transfer of resources through the Bank is thus quite considerable and Honduras also probably derives some benefit from having the headquarters.

The Bank is also expected to promote "regional" projects as well as balanced growth. The charter states that the Bank is to assist "infrastructure projects for completion of existing regional systems or which compensate for disparities in basic sectors which hinder the balanced developments of Central America ... and shall not finance infrastructural projects of purely local or national scope". (1) The Bank also lends to many industrial projects which rely mainly on the regional market - Phelps Dodge (copper and aluminium electrical conductors), CAVISA (glass), and the agreement specifically prohibited the Bank from lending to "essentially local enterprises". (2)

CABEI has also tried to promote one or two projects with Latin American capital ("Cavisa" and the Colombian owned "Fabrite" textile plant in Nicaragua) and prefers to lend to joint ventures, e.g. Hercules-Pennsalt with substantial INFONAC equity, Phelps-Dodge (50% government owned through INSAFI), Sherwin Williams. However, much of the credit goes to projects whose equity is owned by American enterprises; e.g. Bemis & Standard Fruit (textiles and edible oils in Honduras) and W. Grace in foodstuffs. Its main, and very considerable achievement, has been to multiply its Central American investment ($40m) by over eight-times by means of loans from U.S.-AID, , Mexico, Spain, France, Netherlands, Belgium, Switzerland, the U.K. and other countries. (3) Some of this finance would have come to the region . projects and to national "financieras", but a good

*Footnotes p243.

deal, especially from the smaller European countries, may be irreplaceable. The Bank has however been criticised for inefficiency and confused operating criteria, (2) and while CABEI would appear to be a useful supplement to other regional institutions, it is scarcely capable by itself of remedying the problems of imbalance and certainly of duplication. "There is no conclusive evidence that its loans have stimulated the establishment of regional industries ... Few of its projects have been genuinely multi-national ... It has not provided an alternative balancing mechanism to the integration industries scheme. It has not avoided the usual problems of international lending agencies: lack of trained personnel, inadequately designed projects, reluctance to assume exchange risks, debt service difficulties, disputes over the national distribution of benefits ... and of course, the usual lengthy delays and cumbersome administrative regulations." (4)

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(1) Constitutive Charter of the Central American Bank for Economic Integration (Managua, Dec. 13, 1960) Article 1.

(2) Ibid. Article 2.

(3) The Bank is treated here as incorporating the Central American Fund for Economic Integration (est. 1963) which is to finance infrastructure.

(4) P. Schmitter: "Central American Integration: Spillover, Spill-around or Encapsulation" Journal of Common Market Studies, 1970, op. cit. pp.9-10.

(c) A third intermediate possibility is to have agreements whereby regional free trade or incentives or protective tariffs, are conditional upon siting a plant in an agreed location but where there is no legal barrier to entry. An example of this is the Integration Industries Scheme which represents perhaps the nearest thing to a full Regional Investment Policy in Central America. This scheme tries to eliminate all the defects of an uncontrolled market situation simultaneously. First, it tries to deal with the "imbalance" problem by operating so that it "shall be effected on a reciprocal and equitable basis in order to ensure that each and every Central American state may progressively derive economic advantage." (1) This principle is enforced by a clause which states that no country should have more than one integration industry before the others have one each.(2) Second, it tries to prevent duplication and is largely concerned with attracting firms "the minimum capacity of which requires access to the CACM in order to operate under reasonably economic and competitive conditions".(3) These firms are offered what is intended to be regional monopoly status, by means of a free trade area in countries which accept Integretation Industry and by a ten year, regularly declining ("infant industry") tariff against any country which establishes its own industry in competition. In order to qualify as in Integration Industry a minimum capacity has to be established. Any monopoly established is then supervised by prices and quality control, by ensuring competition in the retail sector and by powers to permit imports and to designate other plants. Third, the question of ownership is dealt with by insistence on a certain percentage (usually 40%) of local equity capital.(4) The nature of the scheme ensures that its benefits, which include free trade and a common tariff, controls over dumping and duty raw materials and intermediate products, are conditional upon strict standards being met. In these ways the scheme seems ideally suited for policing the major industrial projects of the region.

* Footnotes on p.245.

(1) Article I, Treaty on Central American Integration Industries, 1958.

(2) ibid (Temporary Article)

(3) ibid, Article II.

(4) GINSA had 50/50 ownership composition; the caustic soda-insecticide industry had 40/60 (local/overseas) and the plate glass industry was to have 60/40.

However, the reality is very different. Although it could be claimed that a great advance was made in merely getting accepted the idea of joint decisions, in the twelve years since the introduction of the scheme, only two distinct industries have been established (tyres and caustic soda) and the former existed before 1958 without regional status; while one other has been approved (glass plate) and several others are being discussed.(1) It is necessary, therefore, to look at the reasons for the failure of the scheme in practice:

(i) the designation procedure was enormously complex and involved the need for ratification by national legislatives of each industry. The stages through which it was necessary to pass were; preliminary application; SIECA Executive Council approval in principle; ICAITI feasibility study; Executive Council approval and drafting of protocol (itself very complex, specifying location, ownership, quality, capacity, prices, customs duty, etc); signature by Economic Council; ratification by at least three legislatures. Even if all was agreed in principle, the delay of several years in ratification would kill the interest of most entrepreneurs if they could gain entry on any other basis. Furthermore, the scope for delaying tactics was demonstrated abundantly with the original treaty which took three years to ratify and the delays in signing the tyre and tube protocol.

(ii) a related point is that the nature of the designation procedure requires the continuous positive political support of all the partner states (though technically, only three ratifications are required to make a protocol effective). Honduras was able to use this position of "blackmail" to express its dissatisfaction with benefits received from the regional integration by refusing to ratify either Treaty or protocols until 1967. The lack of

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(1) SIECA: "Informe sobre los avances del programa de integracion economica centroamericano (1967-1969" Guatemala, p.8.

cooperation from Honduras may also be attributed to dissatisfaction with the "reciprocal" rather than "redistribution" nature of the scheme. However, in 1969-70 Honduras was fighting to strengthen the scheme against opposition from El Salvador.

(iii) the US government strongly opposed the Scheme and as a region aid donor this was possibly decisive. (1) "It is hoped that the Regime of Central American industries does not become a lasting feature of the regional economic integration programme". (2) The Americans thought the scheme was an unnecessary addition to CABEI, industrial incentives and market forces in general; was conducive to monopoly and arbitrary decision making, encouraging corruption and favouritism; and permitted tariffs in intra-regional trade. However, the dislike of the scheme felt by US investors because of its restrictions was probably a more likely source of motivation.

(iv) there was a general failure of direction with no attempt made to draw up a coherent priority list for "trading-off" one project against another, and in a context of regional planning. Projects have been considered on an entirely ad hoc basis with great divergencies in the levels of projects preparation. This defect was recognised in 1966 by subsequent reviews of progress. (3)

(v) in practice, the scheme has not proved to be a necessary condition for establishment of regionally based plants. Plants have been established in fertilisers, oil refining, insecticides, which ideally should have developed under the scheme. Generous treatment by fiscal incentives, tariff protection for example, under the Special System, ensure the benefit of the scheme without its problems. The one real asset of I-I status, a guaranteed regional monopoly, was shown to be hollow by the activities of Firestone in establishing

(1) Explained in J.D. Cochrane: "US attitudes to Central American Economic integration" Inter-American Economic Affairs, Nov. 1963.

(2) Letter from R.E. Simpson, Director of Office of International Regional Economics; Dept. of State, Washington, DC, published by USA I D as "Comments on the Integration Industries Scheme" (ROCAP, Guatemala). (United Nations ECLA).

(3) "Economic Committee for Econ. cooperation in the Central American Isthmus" 1966 Mexico.

in Costa Rica.

(vii) the experience of GINSA and Hercules-Pennsalt (Caustic soda and insecticides) has been unhappy and has probably discouraged other potential applicants. Although the GINSA plant was already in existence the firm had considerable difficulties both in getting Integration Industries status and subsequently. The company had to compete over tariffs in Honduras which did not ratify, and against Firestone which started operations in Costa Rica. Second, there was interference by SIECA in group marketing policy with distributors referring to handle more profitable imported tyres and reluctant to hold in store the volume of GINSA inventories required by SIECA. Third, the tariff has proved inadequate and there has been evasion of the tariff by prior stockpiling and importing cars complete with tyres. The plant had an agreement signed in 1963, ratified in 1965, and only operative in 1966. Thus "integration industry" status has not conferred on the industry the security and advantages that it anticipated. (1)

The Integration Industries system suffered its most serious blow, when a competitive system was introduced that was a great deal more permissive, while retaining the essential ingredient of giving a regional market (and special protection) to "regional" enterprises. This programme was introduced in Jan. 1963, in the 1st Protocol (San Salvador) to the Convention on Integration Industries, and became effective in February 1965, except in Honduras. Under it, the Economic Council of SIECA can give concessions - free trade and a common tariff - to industries which are "new" and "of particular interest" and planning to operate on more than a national

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(1) SIECA: "Problems of the Tyre Industry" SIECA/CE - XXX/DT2, 1eth Oct. 1967.

Diagram 4-4; Special Industries

Industry	Designated	Location	Annual Capacity	Regional Market for particular product range	Nominal Tariff-1968 prices (approx)
Light Bulbs	1965	San Salvador (INPELCA)	6,200,000 units (two shifts)- bulbs & lamps	(1968) 10,300,000 bulbs & lamps	40%
Glass Bottles	1967	Guatemala (VICASA)	78,000 units	(1970) 47,000 units	40%
Metal Cylinders (i)		Guatemala (CILCASA)	150,000 units	(1969) 75,000 units	25% (approx)
(ii)		Costa Rica (Tropigas)	135,000 units	(1969) 75,000 units	
Sulphuric Acid		El Salvador (FERTICA)	23,000 (1970)	(1969) 13,000 MT	15%
Agricultural Implements		El Salvador (Sta. Ana.) (also plants in Guatamala & Nicaragua	700,000 units	estimates vary from 500,000 to 825,000 units	35%
PVC		Nicaragua (Mitsui Shin-Etsu)	6,600 MT to 8,000	est. 6,300 MT to 7,150 MT	100%
Fluorescent tubes (i)	1969	El Salvador (INPELCA)	1,920,000 units	1,130,000 units	100%
(ii)		Costa Rica (PHILLIPS)	1,730,000 to 2,034,000 units		
Soft Paper		Costa Rica (Scott)	5,230 MT	7,600 MT	40%

market. Like "Integration Industries", "Special Industries" have to be embodied in a Protocol and endorsed by national legislatures. But the differences are greater:

(a) there is not attempt to control or even indicate optimum locations,

(b) there are no "barriers to entry" and no limit to the number of firms within an industry enjoying the same status provided that each plant's capacity is half that size of the regional market.

(c) there is no close or systematic control over prices and quality though the Executive reserves the right to lower duties to previous rates as a counter to excessive profits in the industry; and if local supplies are deficient to allow quotas of imports at previous prices.

(d) Status is easier to obtain because extensive preparatory study is not required - though in 1965, SIECA, on the insistence of Honduras, decided that in some cases studies could be ordered.

The attraction of the scheme is obvious to potential entrepreneurs who want a protected status without the controls and procedural problems of Integration Industries status. From the governments' point of view, too, there is no serious constraint on the number of plants established. However, the scheme fails to deal with any of the basic problems of the regional arrangement. There is no provision for 'balanced development'; the combination of tariff protection and minimum tariff capacity requirements encourage duplication by permitting plants to run at low rates of capacity utilisation; and the policing of prices is vague to a high degree. One way of demonstrating the inadequacy is to show diagramatically the location of 'special industries' the relationship between their capacity and the market; and the tariff (Diag.4-4).(1)

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(1) Information from SIECA: "Information sobre los avances del programa de integracion economica Centroamericana (July 1967-May 1969)" Sieca/69/S.G. 52 July 1969: "Estimate of regional demand for sulphuric acid relative to capacity installed in the sulphuric acid plant at FERTICA, El Salvador" SIECA/70/v. 5/25 25th May 1970: "Estimate of demand in relation to capacity installed in CILCASA - Guatemala" SIECA/SEPAP/0.1 1-69: "Estimates of regional demand for various agricultural instruments" SIECA/LE - XXV/DJ/22: "Estimates of regional demand for PVC and its relation to capacity installed in Polycasa, Nicaragua" and "Estimate of demand for glass in relation to capacity installed in VICASA".

Diagram 4-4; *Special Industries*

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Soft Paper		Costa Rica (Scott)	5,230 MT	7,600 MT	40%

The conclusions which emerge are:

(a) the "laissez-faire" approach has led to a polarisation of investment with the "underdeveloped" areas being neglected. Of the plants mentioned, El Salvador has attracted the largest number of industries (sulphuric acid; fluorescent tubes and bulbs; agricultural instruments and machetes) and Guatemala does quite well (bottles, machetes and metal cylinders). Honduras has none.

(b) the degree of control over capacity is low. In some cases there has already been duplication (fluorescent tubes, machetes and metal cyclinders) and in other cases (PVC, sulphuric acid and glass bottles) capacity has been installed well above the total regional market without consideration of competing projects that are currently being planned.

(c) Many of the industries scarcely deserve the tag "of particular interest to the region". There are several industries (fluorescent tubes, light bulbs, agricultural instruments), which are little more than assembly industries with low net foreign exchange saving. The chemical industries (PVC and sulphuric acid) both use imported raw materials. The cost of this type of processing is reflected in the high external tariff, and even higher effective protection.

The scheme has, in fact, evolved as little more than a mechanism for giving protection, though the minimum capacity constraint is some incentive to establishing regionally based plants.

Also within Central America has been the common textile policy described earlier; a voluntary agreement on the location of future or, expanded, textile installations within the framework of a common tariff. This policy incorporated redistributive measures to strengthen the textile industry in Honduras and Nicaragua.

The programme that was finally agreed was incorporated in the second protocol of Managua to the Agreement on an External Tariff.[1] It involved a substantial increase in tariff protection on finished textiles, a restructuring of the tariff to prevent cotton thread and crude textiles being imported duty free, and there was agreement on the installation of additional capacity in the region to 1970, unless any additional capacity was for extra-regional exports. Enforcement was left rather vague, but it was implicit that continued free trade and maintenance of the common tariff was conditional upon mutual respect for the agreement.

Three examples, of varying degrees of permissiveness, have been given of approaches to a regional investment policy in Central America which go beyond mere consultation yet stop short of mandatory control. In other areas similar techniques have been employed. In the Central African group (UDEAC), for example, the various governments have a commitment to plan the allocation of industry; and projects which require the regional market in which to operate have to be approved by all the partner countries.[2]

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(1) (i) to place restrictions on the expansion of spinning and weaving capacity,
(ii) that as Guatemala and El Salvador had an overwhelming dominance in the textile industry, especially in spinning, new capacity should be steered towards Honduras and Nicaragua especially.
(iii) that there was serious excess capacity in the painting and finishing departments, and for this reason, restraint in building completely integrated plants and the idea of pooling finishing sections was urged,
(iv) the part of the market so far not locally satisfied was that requiring long fibre cotton for fine cotton thread which is produced satisfactorily only in Guatemala, so that there was a supply constraint on further expansion of output.

(2) This is in addition to the terms of the "tax unique" where no account of location was involved in granting status to regional enterprises. Within UDEAC there are also bilateral agreements over the location of cement, match and battery factories.

The LAFTA group encompassed a scheme for intrasectoral "complementarity agreements" and sectoral agreements or "little common markets".(1) "Complementarity agreements" are free trade areas in specific products or groups of products between any group of LAFTA countries. The basic philosophy behind these agreements is "coordination ... with a view to establishing complementarity agreements which would avoid the duplication of projects".(2) The complementarity agreements started out as designated-product free trade area agreements incorporating the principles of the GATT "most favoured nation" agreement. This aroused little interest and only two agreements (calculating machines and electronic tubes) went ahead. (3) There was then a series of agreements which built in discrimination against other LAFTA countries but only two were finally ratified. Then came some more significant agreements; a major project covering the whole chemical industry (115 products), signed in 1968; and a petrochemical agreement between the Andean countries which incorporated special treatment for the less developed partners, a joint approach to foreign investment and specification of locations for new enterprises. In the last few years several agreements of all kinds have been signed (office machinery, electrical equipment, pharmaceuticals etc.).

The complementarity agreements have run into severe criticism and not only for the slow rate at which they have developed: "they can cause costly deviation from optimum resource allocation ... To avoid unemployment in the high cost countries, complementarity agreements might be entered into

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(1) N. Maritano: "A Latin American Economic Community" Notre Dame Press, 1970, pp.118-120. UNIDO: "Industrial Development Survey II" p.119.

(2) S. Dell: "Obstacles to Latin American Integration" op. cit.

(3) The progress of complementary agreements to data is set out in J. Sloan: "Lafta in the 1960's: Obstacles to progress" International Development Review, No. L. 1972, pp.16-26, and H. Bell: "Tariff Profiles in Latin America" Praeger, 1971, pp.135-136.

which would allow the high cost countries to continue production ... Thus complementarity agreements can freeze a trade pattern which could represent high social costs to the integration area". (1)

The LAFTA Countries also, unsuccessfully, have tried to launch sectoral programming of particular industries involving periodic conferences of businessmen and civil servants, discussing proposed multinational enterprises, involving exclusive allocations of plants under complementarity agreements and a regional development fund. (2) Despite considerable discussion of steel, automobiles, and other industries, nothing has, so far, been accomplished. Indeed "all in all, the record of industrial location policy within LAFTA makes depressing reading and gives scant encouragement for the near future". (3)

To conclude this section, what we have done is to summarise some of the approaches so far made to a "regional investment policy", starting with rigorous controls, then the "laxer" alternative of 'consultation' and the use of regional banks; finally arrangements which try to incorporate elements of both flexibility and rigour such as the "complementarity agreements" and the 'Integration Industries' scheme. Generally, and understandably, the laxer arrangements are more popular; and there is no really successful procedent of truly multinational, planned, allocation of industry.

Regional Investment Policy: Operational Questions

A review has been attempted of the rationale for a regional investment policy and of the various attempts to realise one. However, merely to

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(1) D. Baerresen, M. Carnoy & J. Grunwald: "Latin American Trade Patterns" Brookings (Washington) 1965, p.38.

(2) H. Bell: p.137. This approach stems from LAFTA Resolutions 100 (IV) 1965.

(3) Ibid, p.139.

discuss matters at this level of generality ignores some of the basic questions of implementation that such a policy would have to face. Should the policy operate at a project level, sectorally, or as part of an integrated plan? What form of inter-government bargaining is optimal? How are potential projects evaluated for joint promotion? Who owns the multinational enterprises? How are monopolies created by conscious policy to be controlled? What should be the optimum size of the region served?

(1) Project, Sectoral or Comprehensively Planned Investment: One can visualise a whole hierarchy of possibilities in terms of individual joint projects, to sector agreements, to fully integrated planning. Because governments are extremely reluctant to tolerate a large scale infringement on their national sovereignty, one would probably have to concede that a complementary structure could be engineered only for a few sectors. The major advantage of this 'partial' approach to planning is its simplicity. Its major disadvantage is the danger of a completely ad hoc system in which regional projects are chosen in an entirely unsystematic and unplanned manner; as one of the earliest advocates of comprehensive industrial planning put it: "a policy must be completed by formal agreements reached after negotiation, concerning what industries should be located in what countries. This implies the need for joint common planning." (1) This planning would involve a confrontation of plans to identify inconsistencies with mutual readjustments to take account of discrepancies. The absence of a framework of planning is serious from two additional points of view. First the question of gains and losses will be obscured if the regional market is simply parcelled out to dominant suppliers without regard either to comparative costs or to the interests of weaker countries.

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(1) S. Myrdal quoted in H. Lary: "Imports of Manufactures from Less-developed Countries" op. cit. p.12.

Second it could lead to the promotion of the wrong types of industry with high effective protection of small value added dissipating much of the 'gains' from economies of scale: "the danger of an unplanned industrial investment policy is that it may increase external vulnerability without adding very much to the underlying growth potential". (1) The example of the Special Industries System in Central America (and of some complementarity agreements) is clear enough evidence of this type of development.

On the other hand it has already been shown, that "comprehensive planning" is beyond the capacity of Central American countries even at a national level. National planning bodies were only established in 1963 and governments have delegated very little authority to them. (2) In Central America there has not been even a minimum of real supranational planning. The "confrontation" of plans by the Pan American Union resulted in no action to eliminate inconsistencies; nor has there been any prepublication coordination of plans; and there is no supranational authority with planning powers. (3)

This has led to the view that the best form of regional investment policy is one which avoids an excessively ambitious comprehensive planning exercise, yet also avoids the distortions that would result from parcelling out individual projects. This could be done by limited 'sectoral' planning

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(1) S. Dell: "A Latin American Common Market" op. cit. p.64.

(2) A. Fuentes Mohr: "Observaciones sobre el Desarrollo de la Planificacion en Centro-america" CIAP/116, 1964.

(3) Pan American Union (O.A.S.): "Report on the Central American Development Plans and the Process of Economic Integration" op. cit. This is not a problem unique to "common market" supranational planning. It has been also a difficulty in any national plans where federal authorities have a good deal of autonomy, e.g. Nigeria (see A. Hazelwood: "African Integration & Disintegration" op. cit. pp.18-19).

It is fair to mention the existence of JCPLAN (a joint advising regional planning body) incorporated into SIECA in 1965.

of key industries; the model for which would be the LAFTA/Andean agreements on chemical products, (1) and which are also suggested by ECA. (2) However, even in these limited terms relatively little has been done in Central America, despite efforts by SIECA officials to draw up a list of priority areas and to plan them. (3)

The crucial question is obviously one of sovereignty. Any attempt to give powers of allocation to a supranational planning body raises the question of loss of control over decision making. A major element in the concern is that the "procedure for allocation of investment may result in an inadequate share": "opposition ... (to joint planning) ... is based ... uncertainties of the indefinite maintenance of the political atmosphere during which the supranational planning effort has been initiated; the opposition of government groups jealous of their pre-regotives and fearful of a fall in prestige and power in the case of far reaching integration and idealogical arguments involving national sovereignty. At very least ... any country joining such a supranational planning effort will attempt to make very sure that it is receiving its proper share of the benefits of economic integration". (4) This leads on to the question of the bargaining procedure.

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(1) The basis of the agreement was a complex, programming solution suggested originally in T. Vietoritz & Z. Szabo: "La Industria Quimica en America Latina" United Nations (Economic Commission for Latin America) 1963.

(2) United Nations (Economic Commission for Africa): "Report of the Mission on Industrial Coordination in East and Central Africa" E/CN.14/247, 1964.

(3) United Nations (ECLA): "Los problemas de politica industrial Centro-americana" Economic Bulletin Latin America, March, 1964, pp.120-123.

(4) United Nations (UNIDO): "Techniques of Sectoral Planning: The Chemical Industries" UN, 66, II B 17, p.48.

(2) The Basis of Allocating Multinational Activities : The essence of a regional investment policy involves nations forgoing, even if temporarily, their right to (unilaterally) proceed with certain investments. Even if we confine ourselves to the limited form of sectoral planning outlined above, and were to draw up a list of industries which should be operated in the multinational market, there would still be difficulties in allocating them. The main question is one of reconciling equity and efficiency criteria; but one also needs to decide whether allocation should be on a sectoral product or subproduct basis, and how the allocation is to be realised in fact. The essence must be that each country feels it is deriving some benefit without insisting upon narrow reciprocity conditions.

Examples of schemes have been quoted which try to allocate specific plants to specific countries to achieve 'balance', for example the Kampala agreement or the R.C.D. arrangement. Such agreements would tend to be arbitrary, the product of horse-trading, so dissipating the gains of scale from operating in a regional market. As Balassa has put it "should governments enter into bargaining regarding the establishment of new industries? I think we can hardly expect government bargaining to lead to a desirable locational structure ...".(1) This could be avoided if there were a broadly based allocation system under which "after all the industries which are tied to specific locations have been allocated to their most desirable geographical zones, the footloose industries can be utilised for working out a pattern of mutually satisfactory regional compensations".(2) This requires a substantial list of potential industries to use for compensation purposes. However, "the difficulty with this solution is that allocation of a long list of industries is likely to be an exercise of some futility. Any list is

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(1) B. Balassa: "Economic Development and Integration" CEMLA, 1965, p.119.

(2) United Nations (UNIDO) "Techniques of Sectoral Economic Planning : the Chemical Industry" op. cit. p.49.

an expression of hope that the industries can be attracted at all, and that they can be attracted to the countries to which they have been allocated".(1) Partly, for this reason, the Central American Integration Industries Scheme tried to limit itself to specifying that no more than one industry should be allocated to any one country simultaneously without specifying ex ante what they should be.

Enforcement is also a problem, especially where equity considerations have over-ridden efficiency considerations. If one prohibits the establishment of enterprises in certain locations there is a real possibility that certain enterprises could be discouraged from investing in the region altogether. This could only in part be controlled by trying to ensure that cases where resource endowments or cost differences are important, are allocated by efficiency criteria. Even then, as long as investment was largely undertaken from private sources, mainly from overseas; preferences based on unquantifyable factors such as the 'political climate' are likely to be very important. It also follows that tax and exchange control (and for that matter all controls on overseas investment) should have first been harmonised to prevent any conflict between goals of the regional policy and of national interests.

The comprehensiveness of the policy is also important in trying to reach an agreed bargaining situation. The greater the number of sectors or projects being considered including possibly agriculture or infrastructure then the greater the possibility for a satisfactory 'package deal' being agreed, but the greater, in turn, the problems of preventing 'ad hoc', unplanned development.(2) The Eastern European countries have found that

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(1) A. Hazelwood: "African Integration and Disintegration" op.cit. p.19.

(2) It is also possible that there might be vertical as well as horizontal specialisation as part of a regional policy, with component or subsidicy activities dispersed to designated areas.

intra-industry specialisation has been more acceptable amongst the planned economies, since few countries are prepared to forego completely the establishment of basic industries like steel or petroleum, though they will accept horizontal subproduct and vertical specialisation. (1) In a Central American situation where basic capital intermediate industries are almost completely nonexistent this problem is likely to be less serious but even so it is doubtful if any Central American country would trade off industry against agriculture, or accept the loss of any basic industry already established, such as cement and petroleum, in the interests of economies of scale. We have to start from the assumption that an industrial investment policy would incorporate an 'industry preference' and apply to new industries only. (2)

(3) Evaluating and Quantifying the Results of a Regional Investment Policy: The original assumption underlying a regional investment policy is that there were net gains to the region in the form of capital savings and new enterprises that would otherwise not be established. However, it has been shown how a policy, especially if carelessly applied, could lead to the capital savings being dissipated from investment in sub-optimal locations and from the loss of external economies as an inevitable consequence of decentralisation, (3) and to prospective investment being lost to the region altogether. For this reason it is important that any regional investment policy should be subject to finer quantification than a crude barter of projects.

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(1) United Nations: "Economic Integration and Industrial Specialisation among the Member Countries of the Council for Mutual Economic Assistance" 1966, pp. 21-27.

(2) The basis of a satisfactory package deal is discussed in United Nations; "Trade Expansion and Economic Integration among Developing countries" op. cit.

(3) In some industries, external economies from central industrial locations, may outweigh internal economies. On the other hand there are external diseconomies of agglomeration; and excessive discounting of risk by private investors in unpopular locations.

Attempts have been made to suggest a framework for this by Schydlowsky.(1) First, agreement is reached on which industries are to be subject to regional policy. Second, a 'programming' analysis is done to assess the discounted net benefit at world prices (2) of establishment of different sized plants at different locations. The gains and losses to partner states can easily be calculated: the "losses" to the importer being the additional foreign exchange payed above world market cif prices, for local products. Third, when a set of gains and losses has been assigned for each product and each set of locations, the overall optimum can be calculated by linear programming. If a "distributional" constraint is required (e.g. equal per capita benefits) then this can be accommodated by a distributional constraint in the model or (more efficiently) by side payments. The question of projects at different states of preparedness could be accommodated by having a sequential assignment procedure which would be taken into account that cumulative effects over time, using appropriate discounting. Within this general framework, there have been refinements in terms of the optimising calculation using geometic(3) and algebraic models (4) and one of these models will, in fact, form the basis of subsequent case studies.

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(1) D. Schydlowsky: "Analytical basis for a National policy on Regional Economic Integration in Latin America" Journal of Common Market Studies Dec. 1967, pp.79-96.

(2) This is done by taking the net foreign exchange saved (gross value - foreign imports) and deducting the opportunity cost (in foreign exchange terms) of local factor use; all discounted to present value. This form of calculation is virtually identical to the 'Little method' (I. Little: "A Manual of Project Evaluation" OECD, 1966).

(3) E.g. D. Baerrensen: "A Method for Planning Economic Integration for Specified Industries" Journal of Common Market Studies, Vol.6, 1968/69. pp.1-23.

(4) See Ch. 5.

A very different approach has been suggested as a basis for rationalising the bargaining procedure. It has been argued that the situation is comparable to that of a 'game' and its solution can be resolved using game theory. A hypothetical scheme was sketched out by Isard and Smith for a multi-country regional investment policy involving the 'trading off' of a petrochemicals works and a steel complex. (1) Segal has tried to show how 'game theory' could be used to resolve a bargaining conflict between East African states over gains and losses though the approach is suggestive rather than operational. (2) A recent study of strategies for allocating electricity generating installations amongst Indian states uses a similar method. (3) However, it does appear that this approach is adding another dimension of sophistication (by explicitly incorporating uncertainty) into a quantification exercise which is already, perhaps, excessively refined; and it is not yet clear that the 'game theory' approach can be made operational to cover a large group of products and countries.

(4) Ownership: The requirement that agreed plans be enforced would be easier if industrial investment was made from public funds but in the circumstances of Central America it is very unlikely that local entrepreneurs or state bureaucracies could pioneer difficult industrial projects. On the other hand, there are, for reasons already indicated, strong local objections to total external equity ownership. The insistence of the Integration Industries Scheme on a minimum local equity participation was indicative of local priorities. One way of reconciling these conflicting

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(1) W. Isard & T. Smith: "Game theory, location theory and industrial agglomeration" Papers of the Regional Science Association (18), 1967, also Nos. 19 and 20.

(2) D. Segal: "East African Common Market: inequities in the 1960's: an Arbitration Scheme" (Ph.D.) op. cit.

(3) F. Gately: "Inter-state planning of the urban electricity supply industry: a mixed integer programming approach" Ph.D. (University of North Carolina) 1971- microfilm.

pressures while also enabling the distribution of gains from a regional investment policy to be precisely quantified, was set out by Little.(1) He proposed regional international companies partly owned by local governments or their nationals. Shares are available in proportion to consumption by non-host countries and as there would be a commitment to a low retention ratio; the "dividend" would be a form of compensation both for non-production and for higher prices paid. The proposal was formulated in precise terms and has been criticised on that basis, (2) but the critical assumption behind the idea is that the non-host country shareholding should be aid financed removing the cost of compensation from the host country. This is a somewhat heroic assumption when one recalls the hostility of the United States government to the "regional monopolies" created by the Central American Integration Industries system.

The whole notion of multinational cooperation in industrial enterprise is as yet underdeveloped - the Latin America Adela Investment Company (of private Latin American shareholders) (3) and the small stake of UDEAC governments in the Gabon oil refinery being about the only cases so far (though one RCD project is also on these lines).

One very indirect

(1) I.M.D. Little: "Regional International Companies as an Approach to Economic Integration" Journal of Common Market Studies, Dec. 1966.

(2) United Nations (UNCTAD): "Current Problems of Economic Integration" op. cit. pp.27-28. R. Robson: "Project evaluation of multinational plants in Africa" Journal of Industrial Economics, pp.105-111.

(3) Inter-American Development Bank: "Multi-national Investment, Public & Private in the Economic Development and Integration of Latin America" 1968, pp.311-325.

way of retaining local participation is to use regional development banks as in Central America, the Andean Group, or East Africa, to promote regional ventures: though we have seen, with the Central American bank, how this central objective easily becomes lost sight of.

One implication of private ownership is that abuse of private monopoly power would have to be prevented, possibly by declining protection or gradually requiring exclusive access along the line of the Integration Industries. Actual direct control of monopoly would be more difficult as it presumes a central authority with expert knowledge.

(5) Choice of Industry: One of the basic reasons for developing a more planned approach to industrial development was to develop an industrial structure based rationally on cheap local raw materials, local power supplies or other factor endowment, which offered the prospect of comparative advantage. In a West Indian study it was argued integration that "the production of a small range of materials can lead to a high degree of economic maturity (e.g. paper, glass, plastics, rubber, cement textiles, iron and steel, fuels and chemicals notably alkalis and sulphuric acid)" and "in the production of foodstuffs with high IED and the manufacture of base materials of iron and steel, plastics, paper, rubber, natural and synthetic fibres .. is the basis for prosperity. It seems to us that success in economic development and transformation is crucially dependent on the ability to produce these commodities which are heavily used in the production of other commodities". (1) E.C.A. have adopted a similar approach: "real

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(1) H. Brewster and C. Thomas: "The Dynamics of West Indian Integration" op. cit. p.77 and p. 353.

industrial growth depends on stimulating activity at a number of key growth points. This means the installing now of modern industries strategic for economic development". (1) However, the need for industries with high multiplier and linkage effects should not blind one to the danger of dis-economies arising from its establishment of plants in previously non-industrial locations.

While most arguments in favour of regional investment policies tend to stress the role of these strategic manufacturing sectors (2) it must be stressed that other criteria could equally well be employed to give different priorities.

(6) Supra-national Institutions: It has already been made very clear the determination of the Central American governments to control the Integration Industries scheme even in its minor details. In all integration schemes so far established there has, in practice, been virtually no delegation to supranational bodies. In LAFTA, CACM, UDEAC, the Mahgreb, RCD (also CARIFTA and Andean group) the chief decision making body is a body of Heads of State or ministers, assisted by a permanent Secretariat with limited power.

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(1) Report of the West African Industrial Coordination Mission: E/CN.14/246 1964, p.14. Also, R. Green & A. Seidman: "Unity or Poverty" Penguin, 1968.

(2) J. Cardenas: "Latin American Activity in the Multinational Investment Field" in Inter-American Development Bank: "Multinational Investments in the Economic Development and Integration of Latin America" op. cit. p.359.

However, "an equalising mechanism is difficult to establish without the creation of a supranational authority with discretionary powers and independent means" (1) and "the continuous renunciation of national sovereignty is the price that countries must pay to achieve successful integration". (2) This, in its extreme form, must involve the right of a supranational body to write or vet national plans, to levy revenue and control industrial location. In the absence of such delegation to a higher authority there is need for continuous and positive bargaining. In either case the problem is political: "the building of the Common Market is an exercise in politics and it is a question of the most delicate kind involving, as it does, the ultimate question of national sovereignty". (3)

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(1) C. Franck: "East African Unity Through the Law" Newhaven, 1964, pp.69-70.

(2) F. Kahnert: et al "Economic Integration among Developing Countries" op. cit. p.42.

(3) R. Hansen: "Central America: Regional Integration and Economic Development" op. cit. p.62.

Conclusions

A review has been made of the rationale for a regional investment policy. Other methods of rectifying the tendencies to wasteful duplication of capacity and disequilising tendencies have been discussed and all had inherent limitations. So however, did the regional investment policy approach, but even its critics have been prepared to concede "that industrial allocation is not a device which should be dismissed as a possible ingredient of a regulated customs union ... (even though) ... it would be wrong to think of (it) as the simple and complete answer ...". (1)

A more commonly agreed position is that "an effective regional investment policy is both an essential condition for a regional integration scheme among developing countries and the sure sign of the scheme's success". (2)

A review of attempts at regional investment policy showed the dangers of excessive rigidity, complexity and unrealistic expectations of planning on one hand, and permissiveness on the other. Consideration of previous experience and general operational questions indicated that a regional investment policy was most likely to succeed if:

(a) 'industry preference' was recognised as a starting premise for all countries,

(b) if it could be confined to a few sectors which would otherwise probably not be developed; preferably key sectors of strategic importance.

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(1) A. Hazelwood (Ed.): "African Integration and Disintegration" op. cit. p.21.

(2) F. Kahnert et al op. cit. p.46.

(c) if aid finance could be available to cushion losses to non-host countries,

(d) while recognising the "partial" approach - as in (b) - the range of the policy should be as comprehensive as possible to give bargaining flexibility which means that it is necessary for some kind of planning exercise to ensure consistency,

(e) the policy should be properly costed and programmed so that diseconomies from misallocation of resources could be estimated and the costs and benefits to individual partner states made clear.

The latter point seems a particularly crucial factor and so the rest of the thesis will be devoted to showing how a regional investment policy in several key sectors might be costed and programmed.

The relevance of such a policy should not be underestimated even if the history of previous efforts in Central America has not been very successful. For example, periodically, proposals have been put forward for reviving the Integration Industries Scheme in a more flexible and potent form; (1) and with the benefit of hind-sight one says that: "many of the difficulties prior to the El Salvador - Honduras war were due largely to an over-emphasis on regional trade liberalisation on one hand, and, on the other, to a neglect of joint industrial policies ...". (2)

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(1) SIECA Carta Information No. 52 and 61, 1966.

(2) W. Wionczek: "Latin American Economic Cooperation" Journal of Common Market Studies, Sept. 1970, p.64.

Chapter 5. Economies of Scale: Transport Costs and an Optimal Distribution of Production Units

We start from the assumption, justified in Ch. 4, that a regional investment policy on a product or sector basis is the basic policy instrument required within a Common Market to realise economies of scale, and also avoid the problems of 'duplication'. But this, in turn, raises locational problems in as much as markets are geographically dispersed and economies of scale consequently limited by transportation costs.

In this Chapter an attempt will be made to be more precise about what we mean by 'economies of scale' in this context, and to quantify its significance and that of limiting factors such as transport costs. A model is described which can be applied to particular industries and the limitations of the model are analysed prior to its use in several case studies.

Economies of scale: It is not intended to describe in detail much of the existing secondary source material on economies of scale but some attention must be paid to the meaning and sources of economies of scale first, and then to problems of measurement.

We should start with a definition; that economies of scale occur when average costs fall with increased output (of a plant usually, but possibly of a firm). Distinctions are normally made between "short-run" economies of scale - the relationship between output and average cost for a given capacity - and "long-run" economies of scale - the relationship between output and average cost with variable capacity. (1) This in itself a

(1) Confusions also arise: "Economies of scale" referring only to "short run" economies are described in D. Ramsett: "Regional Industrial Development in Central America" Praeger, 1969, Appendix A.

distinction of limited value as long run average costs themselves change over time with new technology and production techniques and the results of experience of learning, but it is a useful starting point. It enables us to distinguish between economies in respect of plant size as opposed to utilisation of capacity (though the two are not separate problems as we shall see in the discussion on time phasing). (1) It should also be stressed that one cannot assume a homogenous output and economies of scale may apply differently to the different 'dimensions' of scale, which may, for example, be a batch of a sub-product, produced over a limited period of time.

Much has been written on the sources of economies of scale but one can briefly summarise them in terms of those factors which reduce the role of inputs in physical terms per unit of output. (2)

(i) there are economies in the input of capital because of indivisibilities. Certain items of overhead capital (roads and railways, power lines etc.) are likely to be constant for varying outputs. This applies also to certain managerial and skilled labour inputs. Only raw material inputs are likely to be unaffected (3) (except possibly in respect of handling economies).

(ii) there are continuous economies of scale because of engineering processes requiring relatively smaller quantities of metal inputs as capacity increases: the "•6 rule" has been frequently quoted in this respect, and is important for tanks and process equipment in the oil and chemical industries. (4)

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(1) With demand growing over time, an "optimum size" will not be technically determined but also influenced by the rate of time preference, the rate of growth of demand for the product, and of possibilities for phasing in imports.

(2) Various types of economies of scale are described in . Krainin: "On the dynamic market effects of customs unions" Journal of Political Economy, 1964. . Pratten: "Economies of scale in manufacturing industry" Cambridge Dept. of Applied Economics, Occasional Papers, No. 28, 1971, pp. 5-10 and in many other references.

(3) J. Haldin & D. Whitcombe: "Economies of Scale in Industrial Plants" Journal of Political Economy 1967, pp.373-85. United Nations: "Plant size and economies

P.T.O.

(iii) "stochastic economies" or "economies of massed resources" because of the need to stock less by way of raw materials and spare parts.(1)

(iv) specialisation of labour, management, maintenance staff and equipment (and overheads generally) becomes practicable at larger scales of operation. One could include here economies in research.

(v) "learning behaviour" is believed to have a considerable effect in lowering the cost of production as production runs are lengthened.(2)

There is now a good deal of "micro" and "macro" economic evidence which puts quantitative flesh on the theoretical bones. (3) There are the "macro-economic" studies of Chenery and others, dealt with in some detail in Ch. 1 and Appendix 2 which "explain" the advantages of large countries in developing manufactures and indicate that certain sectors notably petroleum products, metals and chemicals are particularly 'scale sensitive'. We have already discussed the limitations of this approach and the findings are too aggregated anyway. Of the various "micro" methods of calculation - using engineering, accounting and 'survivor test' methods - the engineering method is generally regarded as the least unsatisfactory though there are considerable difficulties in as much as plants at different sizes may be of different vintage and function and there may also be non-technical economies in respect of labour and management input. (4)

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(1) T. Skitovsky: "Economies of scale in spare parts" American Economic Review, 1956.

(2) Learning behaviour is best described in the classic text of K. Arrow: "The economic implications of learning by doing" Review of Economic Studies, 1962.

(3) J.J. Johnston: "Statistical Cost Determination"; F.T. Moore: "Economies of scale: some statistical evidence" Quarterly Journal of Economics, 1959 J. Haldi & D. Whitcombe, op. cit.; United Nations: "Seminar on Industrial Programming" Sao Paulo, 1964.

(4) The "engineering method" is preferred by C. Pratten: "Economies of Scale in Manufacturing Industry" op. cit. pp.20-28, and by J.S. Bain: "Barriers to New Competition" op. cit. in two classic works on the subject. The different methods are critically reviewed in B. Gold: "New perspectives on cost theory and empirical findings" Journal of Industrial Economics, April, 1966.

Economies of scale have been shown empirically to vary in importance at different parts of the cost curve. Eventually, diseconomies of scale can be manifested: efficiency of factor use declines as the quantity of the factor applied increases. There may be technical reasons why large sizes become uneconomic; such as managerial difficulties and problems of alienation amongst the labour force (1) (however, there is a considerable difference between diseconomies to the firm and to the plant). Most empirical research has tended to indicate that long run average cost curves have an L-shaped rather than U-shaped with a minimum economic size (mes) which represents the lowest size for the realisation of full plant economies.(2) The actual size of any plant will not solely by guided by the minimum economic size as technically defined. It is also necessary to take into account the factor mix of different processes, the size of the market and growth of demand; and the cost of competing imports. Even in industries where economies of scale are important small plant sizes may be encouraged by small markets, by a desire to avoid the risk of obsolescence from technical progress, by the local availability of (bulky) raw materials and water supply, by the abundance of cheap labour encouraging labour-intensive techniques, and in some industries (e.g. cotton spinning and weaving) by technical factors.

The particular diseconomy which we are immediately concerned with is that of transport costs. As the scale of a plant increases, the geographic spread of markets is increased (unless

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(1) C. Pratten: op. cit. pp.14-16; E.A.G. Robinson: "The Structure of Competitive Industry" Cambridge, 1953, pp.182-183.

(2) J. Bain: "Barriers to New Competition" op. cit. V.K. Gupta: "Cost Functions of Industry in India" Journal of Industrial Economies, 1968-69, pp.57-73. J.Johnson: op. cit. Ch. 5. J. Blair: "Relation between size and efficiency of business" Review of Economics & Statistics, 1942.

increased sales can be accomplished by greater sales to existing customers) and the average unit costs of transport will rise. If transport costs are heavy, then optimum sizes will be smaller. There are a great many possibilities depending upon the weight of the final product, the weight of raw materials, the geographical distribution (and growth) of demand, distribution services, economies of scale and transport costs. Generally, it will be possible to achieve a determinate optimum spread of production points which minimises production and transport costs. (1) There will be points where transport costs of either raw materials or final products are very high relative to the value of a product and economies of scale and conversely where economies of scale are substantial relative to transport costs. The relationship between raw material and final product transport costs is important in determining the extent to which production is 'market-orientated' or 'footloose' or 'rooted'. The case where transport costs are sufficiently large to affect the optimum capacity is to some degree a special case but nevertheless one which embraces most goods transported in LDC's including fuels, minerals, building materials, fertilisers and agricultural products. Clearly there is a need to relate trade theory to transport costs. (2)

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(1) E.g. for a theoretical discussion L. Lefeber: "Location and Regional Planning" North Holland, 1966.

(2) W. Isard & M. Peck: "Location Theory and International and Inter-regional Trade Theory" Quarterly Journal of Economics, 1954, pp.97-114.

Evidence of Economics of Scale.

In order to demonstrate the role which economies of scale might play in quantitative terms, a review is made of some of the main quantitative surveys of economies of scale in manufacturing. Before discussing the figures, a brief review of the studies will be made:

(i) Numerous attempts have been made to apply the results of Bain's work in the U.S. based on engineering and economists' estimates, and already described in Ch. 4.(1) The drawback is that estimates of costs made by engineers are for levels of output which have never been experienced and are hypothetical. Another particular disadvantage of working directly with Bain's twenty industrial cost curves is that they are now somewhat dated and also open to the criticism that data obtained from rich industrialised countries are of doubtful relevance to underdeveloped countries.

(ii) Efforts have been made to update and extend the results in Western countries and an important study by Pratten of twenty-five industrial categories in the last few years provides a good deal of additional information.(2) For steel and cement, estimates diverge greatly from Bain's estimates, but the rest are compatible.

(iii) The UN. and other organisations have tried to adapt these figures to the costs and techniques of developing countries. Attention will also be given to studies such as that of Metawally using Egyptian data.(3)

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(1) J.S. Bain: "Barriers to New Competition" Harvard, 1956, esp. Appendix B.

(2) C. F. Pratten: "Economies of Scale in Manufacturing Industry" op. cit.

(3) M. M.Metawally: "The Effect of Market Limitations on Industrialisation in Egypt" Yorkshire Bulletin of Economics & Social Research, May, 1967, pp. 37-49.

What we get from this data is first of all some measure of the "minimum efficient scale" (or "minimum optimal scale") which is the lowest scale where minimum cost is realised. To Bain, this was measured by the average plant size in the largest size group. Second we can obtain some measure of the sensitivity of changes in unit cost to changes in scale. Third we can obtain some measure of the sensitivity of investment costs in particular to changes in scale (Diag. 5-1). (1) Inferences have been made, on the basis of medium or average sizes in richer countries to suggest (in an analogous way to the survivor technique), what is a suitable size for beginning production. (2)

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(1) E.g. T. Victoritz: "Programming Data Summary for the Chemical Industry": (United Nations) Industrialistic and Productivity Bulletin 10, 1966. The relationship between investment costs and scale of production is presented in the following formula:

$$\frac{K_1}{K_2} = \frac{(X_1)^{\alpha}}{(X_2)}$$

where K_1 and K_2 stand for the capital requirements of plants 1 + 2, and X_1 and X_2 are the corresponding output levels. α is an empirical coefficient which varies from one industry to another and which would hold true only within a certain range beyond which it would tend to vary.

(2) A. J. Brown: "Economic separation versus a common market in developing Countries" Part I, Yorkshire Bulletin of Economic and Social Research, May, 1961.

Diag. 5-1 Coefficients of Economies of Scale in Investment

Product	Coefficient	Range in which economies of scale are important
Chemicals:		
PVC	•55	2,500 - 40,000 Tpa
Ethylene	•54	10,000 - 60,000 Tpa
Urea	•67	16,000 -165,000 Tpa
Acetylene (from natural gas)	•67	10,000 - 45,000 Tpa
Polyethylene	•87	6,000 - 12,000 Tpa
Caustic Soda	•76 - •80	6,000 - 35,000 Tpa
Methanol	•78	5,000 - 60,000 Tpa
Ammonia	•81 (Mo) •73	18,000 -180,000 Tpa
Sulphuric Acid	•8 (Mo) •80	10,000- 100,000 Tpa
Butadiene	•59	5,000- 60,000 Tpa
Iso-propanol	•50	2,000- 30,000 Tpa
Aluminium	•9 (Mo)	
Petroleum Refinery	•75 (Mo)	
Cement	•77 (Mo)	

Notes: See footnote on p.374

Sources: (Mo), F. Moore: "Economies of Scale: some statistical evidence" Quarterly Journal of Economics, May 1959.
United Nations: "Programming Data for the Chemical Industry" Industrialisation and Productivity, Bulletin No. 10, 1966, pp.7-57.

One must also qualify any report on specific economies of scale relationship in various ways:(1)

(i) where production processes embrace a heterogenous range of outputs as with a steel mill or a petroleum refinery. There is a problem of deciding at what level of aggregation to deal.

(ii) economies of scale looked at here are entirely "internal" and exclude externalities which may be an important element in the savings. A related point is that only one process is considered at a time - in practice certain industries such as chemicals as developed on a 'complex' basis taking advantage of input-output relationships,

(iii) products can be made in several cases by different processes which will have different scale coefficients: steel and acetylene are examples.

(iv) the use of monetary measures of investments and other factor inputs is open to the obvious objection that price levels vary considerably over time and between countries and prices may not reflect true relative costs.

(v) the relationships do not necessarily hold over time due to technical progress influencing optimal scales. However, notwithstanding these qualifications, the figures in Diag. 4-2 and 5-1, if treated with caution, do give a rough idea of the importance of scale effects in different industries.

One might also point out other aspects of economies of scale (in the short run) by illustrating the degree of underutilisation of capacity. Unfortunately, Central American data is poor but for many industries the utilisation rate is on average well below a "good" rate (over 70% roughly) It should be stated however, that there are serious questions of definitions where capacity utilisation is concerned - depending upon whether capacity

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(1) The problems of using technical coefficients in specific contexts is discussed in T. Vietorisz: "Programming Data Summary for the Chemical Industry" Industrialisation & Productivity Bulletin 10, (United Nations). 1966, pp.7-57.

is defined in terms of one shift or more; a concept which, in turn, is not very meaningful in process industries or in very small units. Also, the effect of increased capacity use will vary according to whether it results from better use of equipment or a greater number of shifts. The high levels of capacity under-utilisation in Central America can be explained in many cases by the small size of market relative to the minimum size of plant.

Diseconomies of Scale: Transport Costs.

It is even more difficult to be precise about transportation costs for which comparative data cannot be used, only direct information. The rate structure is enormously complex depending on the route, the road surface, the mode of travel, and the extent of discounts for large and regular and long distance consignments and for return journeys. Rail freights are relatively straightforward and advertised by the companies. Road freights are a great deal more complex and unpredictable. Rail services do not, however, service intra-regional trade, which is carried - 80% by road and 20% by coastal shipping. (1)

An example of the dispersion of average transportation costs was given in a recent transport study (for goods). (2)

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(1) SIECA: "Incidencia del costo del transporte en los precios de los productos agricolas y industriales de intercambio dentro del mercado comun" SIECA/68/VII-5/28, Guatemala, 1968, p.2.

(2) Central American Bank for Economic Integration: "Central American Transportation Study, 1964-65," p.229.

Type of Road	Terrain: Mountain	Rolling	Plain
Trails	20·0	15·0	10·0
Good-weather (Passable) dirt roads	10·0	8·5	7·0
Poor	7·0	6·1	5·3
Average (all weather and paved)	6·1	5·3	4·4
Good	5·3	4·4	3·6
Excellent	4·4	3·6	2·8

Notes: cost is given in cents per MT-Kilometer.

An ECLA Study also indicated the degree of dispersion of road costs on the basis of information from hauliers, on main regional routes. (1) The range was roughly 2·5 c to 7·5 c per ton-kilometer: return journeys gave approximately a 25% discount, and smaller loads were, naturally, somewhat more heavily charged. Generally, for trade of more than 100 km, for busy routes in both directions and for good loads, rates of 2·0 c to 3·0 c per ton kilometer are generally levied where straightforward bulk goods are concerned. Border crossing procedures (even without tariffs) add to costs and risks. It has been estimated that even on the single-leg journey from Guatemala to El Salvador, border-checking and delay can add about 10% to the cif price for bulky products like cement, timber and fertilisers, and may account for low regional trade in these products. (2) This

(1) Economic Commission for Latin America, E/CN-12/CCE/325; (TAO/LAT 48), 1966, pp.50-55.

(2) K. Huber: "Central American Road-User Charges Study" World Bank 1969. (Unpublished).

problem can be eliminated by bonding but this is costly. Generally though the role of transport costs as a limiting factor has been widely recognised in the realisation of economies of scale in the Central American region and in Latin America generally, (1) especially for those industries where the upper limit of economies of scale is greater than the constraints of national markets.

"Trading-off" Economies of Scale against Transport Costs: We have isolated two main non-proportional costs which influence in contrasting ways the delivered cost of products. Perhaps the best way of introducing a theoretical framework is to look at what location theory can contribute. (2) The first point of reference is the work of Weber who tried to establish optimal minimum-cost industrial location with reference to labour costs in different locations and transport costs, of raw materials and products.

Weber's work has been built upon in many ways to predict the market area boundaries for complex patterns by deriving points of minimum transport (and total) cost in a plane. Modified models have included realistic transport costs structures including terminal

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(1) E.S. Carpenter: "Probelmas generales del transportes en America Latina" Inter-American Review of Economics, Vol. I, No. 1 & 2, 1963. J. De Kock: "Los Transportes y las Communicaciones y la Integracion Economica de Centro-america" ESAPAC; Costa Rica 1961 (Seminar Papers on the Organisation and Administration of Roads). R. Brown: "Transport and Economic Integration of South America" Brookings, 1966. H. Snell: "Transportation integration: a variety of problems" in R. Hilton (Ed.): "The Movement Toward Latin American Unity" op. cit.

(2) In this the author has drawn heavily on the main works of W. Isard, notably "Methods of Regional Analysis" M.I.T. Press, 1960, and D. Smith: "Industrial Location - an economic geographical analysis" Illinois, 1970.

charges.(1)

The major weakness with the Weberian "least-average cost" approach is partly that it ignored the interdependence of firms which derives from imperfect competition of which economies of scale may be an ingredient; also, that it ignores variations of demand in space, as will inevitably occur with population concentrations: "as soon as demand is allowed to vary in space the least (average) cost location does not necessarily yield maximum profits ... a new location may have higher unit costs but greater sales will increase total profits ... also a low total cost may simply indicate a low volume of output in a badly situated location relative to the market." (2)

Dealing with interdependence between a small number of producers is a difficult problem and Isard and Smith have shown how it may be necessary to invoke "game theory" to reconcile the conflicting interests of producers in an optimal manner. (3) However, like so many other locational theories it has been suggestive of a possible approach rather than explicitly directed to the foundation of an operational model.

It is perhaps easiest to show diagramatically the nature of the problem. One could start by showing what would be the effect if there were no economies of scale. AB represents a linear market, the vertical axis represents unit costs.

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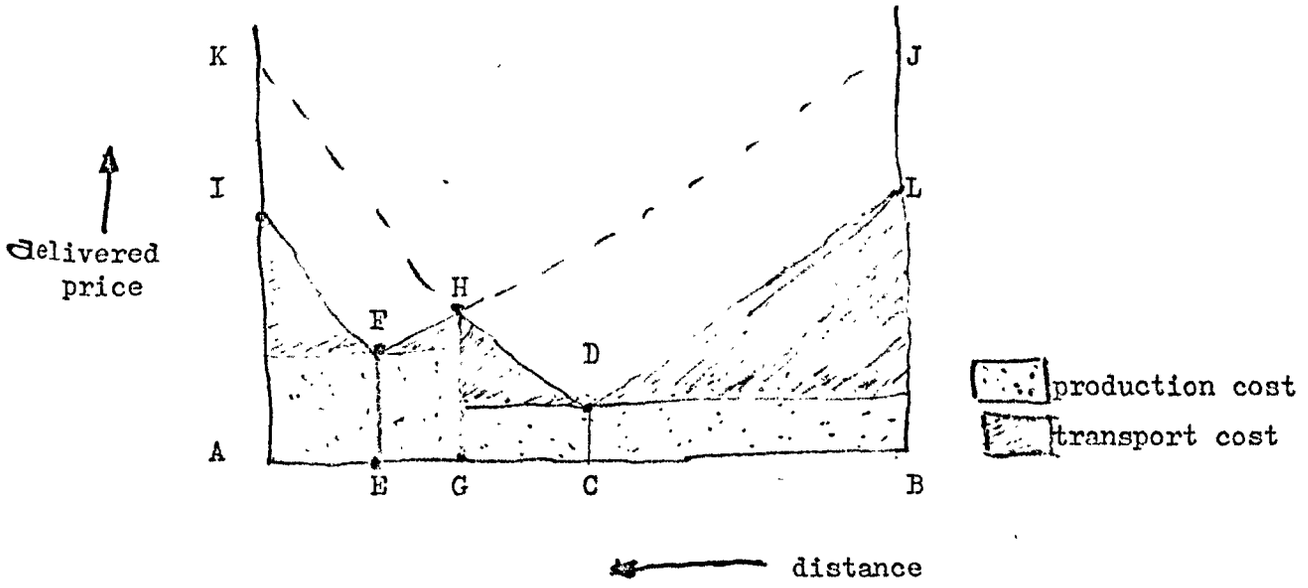
(1) R. Morrill: "The Spatial Organisation of Society" Duxbury Press, Washington, 1970, p.90. The only cost of distance is not only the direct transport cost; there is the use of time involved in journeys, and the indirect social or psychological effect of distance. Transport cost itself may be a complex function of distance usually decreasing exponentially if terminal costs are included; and other factors will influence the cost such as the route, the characteristics of the carrier, and non-competitive rate fixing, e.g. C. Clark: "Industrial Location and economic potential" Lloyds Bank Review, Oct. 1966, also on the motion of "economic distance" is W. Beckerman: "Distance and the pattern of intra-European trade" Review of Economics & Statistics, Feb. 1956.

(2) T. Smith: "Industrial location: an economic geographical analysis" op. cit. p.137.

(3) W. Isard & T. Smith: "Location games: with applications to classic location problems" Papers of Regional Science Association, 19, 1967, pp.45-80. W. Isard: "Game theory, location theory and industrial agglomeration" Papers of the Regional Science Association, 18, 1967, pp.1-11. W. Isard & T. Smith: "Coalition games: Paper 3" Papers etc. 20, 1968, pp.95-107. M. Greenhut: "Games, capitalism and general location theory" Manchester School of Economics and Social Studies, Jan. 1957.



In this very simple case there are two producers whose unit costs are EF and CD. With a linear transport cost function, (BJ, AI) and (AK, BL) represent delivered costs for the two locations. An optimal least-cost solution is where HG represents the market boundary served by the two plants. This is of course, absurdly over-simplified (the linear demand, constant costs etc.). An equally simple set of circumstances based on constant costs can be represented in a linear programming "transportation problem" when complex problems involving large numbers of production and consumption points (with demand assumed to be represented at a point) can be solved to minimise transportation costs and (constant) variable costs. Theoretical models of this kind have been evolved by Lefeber and others. (1) Practical application has also been sought. Ghosh, for example, used this linear programming approach to compute the optimum inter-regional flows for the entire Indian cement industry based on a matrix of nine states. (2) A similar approach has been used for the East African sugar industry (minimising the cost of transport from fields to refinery; (3) and for a very much larger number of

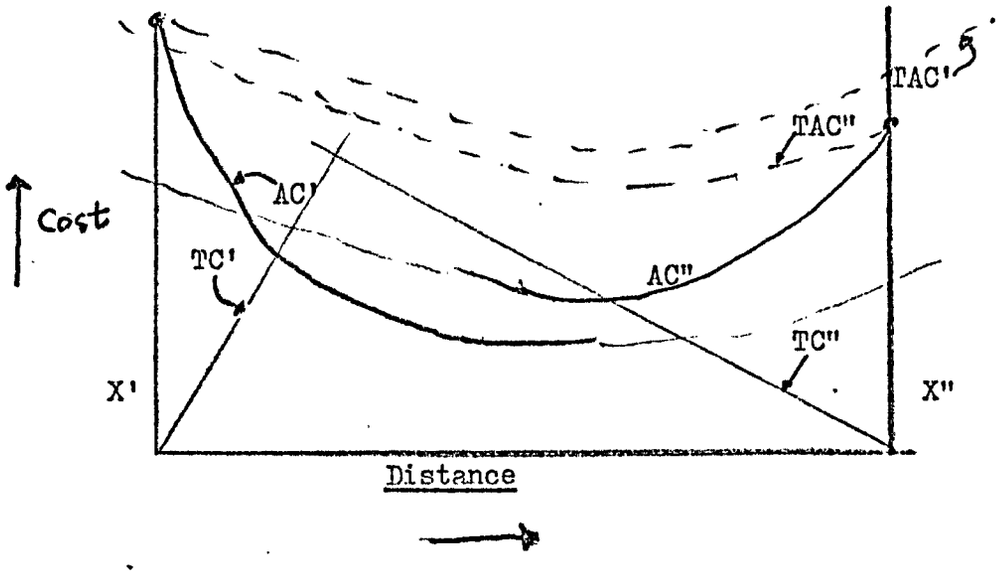
(1) M.C. Bos: "Spatial Dispersion of Economic Activity" Rotterdam, 1965. L. Lefeber: "Allocation in Space" North Holland, 1958.

(2) A. Ghosh: "Efficiency in Location and Inter-regional Flows: The Indian Cement Industry During the Five Year Plans 1950-59" North Holland, 1965.

(3) G. Frank: "The Sugar Industry in East Africa" East African Institute of Social Research, 1965, Ch. 4.

potential locations as in the Russian cement industry.(1)

If economies of scale are considered then there are two conflicting influences on plant location; (2) a larger scale of production is tending to reduce average costs and transportation cost are rising with increased distance from the point of production.



TC' and TC" are transport costs

AC' and AC" are average production costs

TAC' and TAC" are total costs per unit (delivered)

In the case shown above the combination of average cost and transport cost is such that in all cases a plant at X"; operating as a monopoly, would be preferable to two plants. In other cases, rising total costs may make a split market more economic.

The question then arises of how it is possible to operationalise a model which enables us to trade off economies of scale against transport costs. Linear programming is precluded since by definition the formal requirement of conventional optimising techniques from a mathematical point of view is that there should be no non-convesities and indivisibilities, i.e. variables should be continuous. Where non-convesities occur it is difficult to approach an optimal solution and impossible in the case of indivisibilities.(3)

(1) Mints and Finkelstein: "Uses of Mathematical Models in solving problems of Inter-industry/Inter-regional Planning in the USSR" UN Seminar in Planning Techniques at Minsk, 1964, pp.167.

(2) We are, of course, concerned here solely with internal economies of scale. If externalities are important then big undertakings in areas of high growth

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may have additional advantages. However, there are probably insoluble problems of measurement here unless we try to deal with the problem by 'complex analysis'.

(3) T. Victoritz: "Industrial Development Planning Models with Economies of Scale and Indivisibilities" Journal of Regional Science Association, 1963, Papers of Lund Conference, p.1.

It is possible to circumvent the problem of convex production functions by a variety of methods none of which are entirely satisfactory. (1)

(i) one is the 'comparative cost' method i.e. to compare the relative costs of various locations assuming that all plants have equal scale. (2) This approach is just too simple and does not help us to answer the question of how many plants should operate and at what scale.

(ii) a second and more realistic approach is to compare absolute costs for a specified number of realistic programmes, or combinations of factory sizes. Vietoritz & Szabo do this in a study of the Latin American chemical industry involving sites in five countries, twelve market areas and sixty production activities. Formal optimisation was avoided and a series of alternative programmes which looked attractive a priori were explored by means of detailed computations. (3)

Detailed industrial complexes in which economies of scale inhere, have also been dealt with in this manner, by contrasting the cost of one or two likely industrial complexes. In this way, input-output linkages can be accommodated to some extent. In the classic study of this kind a refinery - fertiliser - synthetic fibre complex on Puerto Rico was favourably contrasted to another hypothetical project in the US by comparing absolute costs. (4)

(iii) a useful simplification employed by Vietoritz and Manne was to approximate non-proportional cost items by a fixed cost and a linear variable cost. (5) The particular problem which they investigated was the optimum

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(1) There is a good review in T. Vietoritz: "Programming Data Summary for the Chemical Industry" in Industrialisation & Productivity, Bulletin 10, United Nations, 1966.

(2) E.g. W. Isard & J. Cumberland (Eds.): "Regional Economic Planning: Techniques and Analysis for Less Developed Areas" OECD, Paris, 1961. W. Isard: "Methods of Regional Analysis" M.I.T. Press, 1960, Ch. 9.

(3) United Nations: " La Industria Quimica en America Latina" 1963.

(4) W. Isand, E. Schooler & T. Vietorisz: "Industrial Complex Analysis & Regional Development" New York, 1959.

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(5) T. Vietoritz & A. Manne: "Chemical Processes, Plant Location & Economies of Scale" in A. Manne & H. Markowitz: "Studies in Process Analysis" Cowles Foundations, 1961. T. Vietoritz: "Industrial Development Planning Models with Economies of Scale & Indivisibilities" Regional Science Association: Papers of the Lund Congress, op. cit.

location, at a given point of time, of an ammonia/nitric acid/sulphuric acid/ ammonium sulphate cum ammonium nitrate complex. They simplified the complex process to two stages; ammonia at one stage and fertiliser at the second, by making a series of approximating assumptions. The computer run a complete enumeration of 1024 combinations of ammonia and fertiliser locations to find the lowest production cost/transport cost solution, each locational alternative being represented by a zero/one variable to indicate whether the fixed charge be incurred at that point. This approach has been referred to as a "fixed charge transport problem", as it could be treated as a linear programming problem once the convex function had been linearised.

This fixed-charge (or mixed integer) programming approach has specifically been used for problems of plant location within common markets. The Brookings Institute has endeavoured to show how joint supra-national planning would produce a more efficient distribution of plant than has occurred with national decisions. (1) Other studies have incorporated several stages of production; multiple and joint products, imports and exports. (2)

Eastern European planning exercises have independently evolved to similar approach to the problem; one of the more famous using non-linear programming techniques without the approximation techniques referred to above. (3)

(1) J. Grunwald: "Un projecto conjunto de investigacion sobre la integracion industrial en America Latina" El Trimestre Economico, 1966, pp.435-449. M. Carnoy "A Welfare analysis of Latin American Economic Union: six industry studies" Journal of Political Economy, 1970, pp.626-654, and "Industrialisation in a Latin American Common Market"(E.C.I.E.L. Studies) 1972.

(2) E.g. D. Kendrick: "Investment planning and economic integration" Economics of Planning, 1967, or "Programming Investment in the Process Industry" MIT, 1970. Ana. M. Martirena de Martel: "Integracion y de economicos de escala" El Trimestre Economico, Vol. 123, (1964) pp.412-422 and "Integracion y desarrollo economico" Trimestre Economico Vol. 142 (1969) pp.169-185.

(3) J. Kornai et al.: "Mathematical Programming of the Development of Hungarian Synthetic Fibre Production" Budapest, 1963 (extracts only, seen by author). G. Jandy: "Problems of Location in Operations Research" Regional Science Association Papers (Budapest Conference) 1968. I. Knessic: "Techniques of Industrial Location Programming": V. Meducdeur & V. Kagan: "Economic-Mathematical models & methods of locating industrial enterprises": W. Endicher, I. Klebanov & V. Komlik: "Possibilities of using electronic computers & methods of mathematical programming for solving problems of production location" all mimeographed in "Papers of the UNIDO Inter-regional

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(iv) Finally, attempts have also been made to lift the above model from the static or comparative static confines and to generalise it to cover the best pattern of capacity expansion which is feasible, so that advantage might be derived from staggering investment in such a way that when a deficit occurs at one point there is a surplus at the other. Such an application of mixed-integer programming has been in operation in India.(1)

It was felt that application of methods (iii) and (iv) to the situation of the Central American Common Market could give sufficient flexibility and choice of alternatives to enable us to arrive at something approaching an optimal size/location decision in several industries; and to contrast autarchic with more decentralised solutions.

We are thus able to determine, under certain assumptions, which country in the Common Market has an absolute advantage in producing the products studied. The cost to each partner country of buying from the optimum (or minimum cost) alternative is compared with the cost of importing from third countries or producing the good domestically and the gain or loss to each country from purchasing from the customs unions can be estimated.

An attempt will be made to set out a model using an integer programming approach which is basically the same as that used by Vietorisz & Manne, and Cabay, referred to earlier. There is a series of consumption points, j, (1, 2 ... n) into which a given (price inelastic) demand R_j is assumed to be concentrated, and production points i (1, 2 ... m) at which a uniformly produced homogenous good are manufactured. The cost of transporting the finished product from i to j is Cij. The number of units produced (and thus transported) for market is xij. The costs of production

(1) A. Manne: "Investments for Capacity Expansion: Size, location and Time Planning" Allen & Unwin, 1967. D. Erkenlotter: "Pre-investment Planning for Capacity: a Multi-location Dynamic Model" USAID, New Delhi, 1969.

are divided into those elements which are proportional and nonproportional to output. The proportional costs can simply be added to cij. The non-proportional costs are important with economies of scale, where there is a fractional exponent:

Capital or labour input (K or L) = $a \cdot x^{\alpha}$; $0 \leq \alpha \leq 1$ (α = scale coefficient)

x: capacity

This function can be linearised;

If $\alpha = 0$, K or L = 0

If $\alpha > 0$ K or L = $a + \gamma x$

What this implies is that the non-linear function can be broken down to two components. One is a fixed charge in which is incurred wherever a plant is built at i and the other is a proportional cost which can be added to cij.(1) Wi is the fraction of the fixed cost incurred (0 or 1).

The model can be set out as follows:

Minimise $\sum_i ai\ wi + \sum_i \sum_j cij \times Xij$ ..... (1)

subject to $\sum_i xij = \sum_j Rj$ (all j) ..... (2)

If $Wi \begin{bmatrix} =0 \\ =1 \end{bmatrix}$ then $\sum_i xij \begin{bmatrix} =0 \\ >0 \end{bmatrix}$ ..... (3)

$Wi = 0$ or 1 ..... (4)

$xij \geq 0$ ..... (5)

Equation (1) represents the objective function: it defines the sum of costs to be minimised. While the model is implicitly assumed to be closed it would be quite easy to introduce imports by assuming another source which supplies the good at a given price (the region being a price taker for the world's goods): there would be no fixed charge for imports. Equation (2) implies that demand is met by output, leaving no surplus/or shortfall. Equation (3) is of an either/or type. If a plant is established at i then wi is set to

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(1) In other words, marginal cost is constant while average costs fall with increased scale.

unity and a fixed charge is incurred: if it is not established then wi is zero and there is no fixed charge (equation 4): Equation (5) is formal, eliminating the theoretical possibility of negative output. The model is solved by incentive zero and ones to the zero-one variables, the remaining variables being related in a linear programming trans-shipment problem. For each combination of zeros and ones (or local optima)(1) a separate trans-shipment problem has to be solved.

Hitherto, we have detailed the treatment to be given to one homogenous good involving only one production stage. In fact, many of the more useful studies, of Vietoritz and Manne, Carroy and the Brookings team, and Kendrick operated with two stage production processes, or multiple products. This does not alter the fundamental nature of the problem but involves consideration of interplant shipment costs to final markets; and requires a linearised production cost estimate for each stage of production.

The minimisation of cost model is, therefore, more complex but similar to that indicated before. The model can be set out as follows:

x_{ik} is the number of units of x (an intermediate good) produced at i (a first stage production point) and shipped to k (a "second stage" production point)

y_{ik} is the number of units of y (a final product) produced at k and shipped to j (the product market)

w_i is the fraction of fixed charge incurred for an x plant at i where $w_1 = 0$ or 1.

z_k is the fraction of a fixed charge consumed for a y plant at K where 2k = 0 or 1

a_1 is the fixed annual charge for the construction and operation of an x plant at i

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(1) The "local optimum" is the minimum variable cost for a given combination of plant locations.

b_k is the fixed annual charge for the construction and operation of a y plant at k

c_{ik} is the variable construction, operating and transport costs per unit of x at i plus transport costs from i to k

d_{kj} is the variable construction, operating and transport costs per unit of y at k plus transport costs from k to j

R_j is the market at j

Minimise:

$$\sum_i a_i \cdot w_i + \sum_k b_k z_k + \sum_i \sum_k cik \cdot xik + \sum_k \sum_j dkj \cdot ykj \quad \ldots.(1)$$

subject to $$\sum_i xik = \sum_k yjk \quad \text{(all k)} \quad \ldots. (2)$$

$$\sum_k yjk = \sum_j R_j \quad \text{(all j)} \quad \ldots. (3)$$

If $w_1 \begin{cases} = 1 \\ = 0 \end{cases}$ then $\sum_k xik \begin{cases} 0 \\ = 0 \end{cases}$ (all i) $\ldots. (4)$

$z_k \begin{cases} = 1 \\ = 0 \end{cases}$ then $\sum_j yik \begin{cases} 0 \\ = 0 \end{cases}$ (all k) $\ldots. (5)$

where $xij : yjk \geq 0$

$w_i : zk = 0 \text{ or } 1$

This modification is an important one in dealing with any industry where production may be vertically disintegrated; steel, fertilisers, car production, etc.

The numbers of possible permutations is likely to be very great and complete enumeration may not be possible to find the optimum solution and the distribution of costs of alternative solutions. For this reason, alogarithms specially written for the computer incorporate approximations to the exact optimum solution. (1)

(1) This subject was beyond the author's mathematical ability but attempts were made to follow the logic behind attempts to develop Rawistic methods which could give approximate answers to complex problems. In his own examples the author was able to confine the scope of the exercise to complete enumeration problems.

At this stage it is necessary to review some of the assumptions and simplifications that have been introduced. The whole exercise is of partial equilibrium analysis and rests on ceteris paribus assumptions.

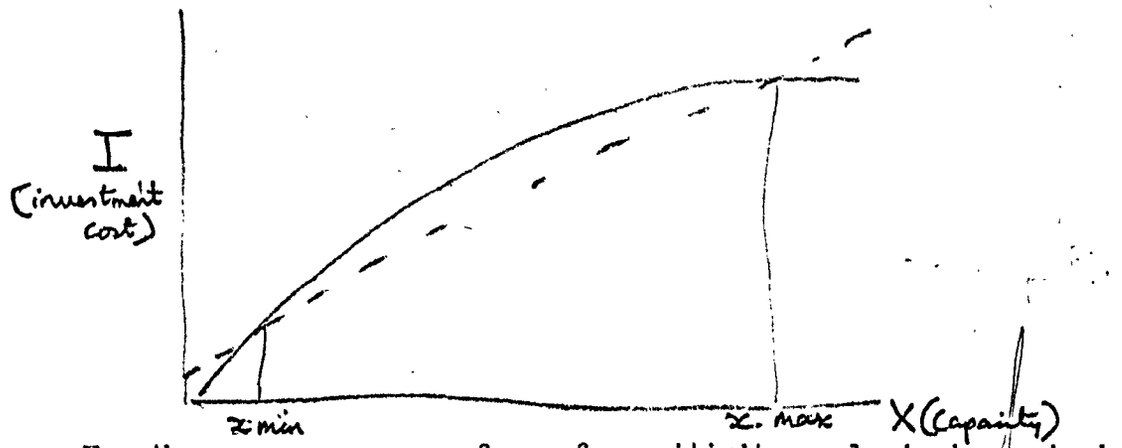
(1) We made several sweeping assumptions about the nature of demand. We have assumed it to be given for a fixed time, price inelastic and concentrated at a point, and projected on the basis of uncertain income levels. These assumptions are obviously open to question. Heavy transport costs will have a considerable effect on delivered costs in peripheral locations and, consequently, reduce the demand in those locations for products which have a positive price elasticity of demand. Also, even with the high degree of urbanisation into Latin American cities the scattered rural population may have to be served, incurring transport costs.

In addition, there is the basic problem of lack of data and the difficulties of making projections. Demand estimates, therefore, would have to be subject to sensitivity testing of some kind.

(2) Economies of scale are subject to even greater simplifications. We are dependent on hypothetical engineering estimates for long run average cost curves, which are applicable primarily to developed economies and tend to embody more advanced and recent technology than will be used locally. We are also having to assume, statically, that technology is unchanged in the foreseeable future.

The linearisation procedure is subject to errors, possibly of considerable magnitude. The Vietoritz and Manne study involved drawing a segment which cut the curve at the points representing "minimum" and "maximum" scale, which data is separately obtained from empirical data.(1) Another possibility is to draw a tangent to the curve at the technical optimum if such data is available. Even assuming that one of these procedures is feasible, more likely the first, the linearisation procedure

does incorporate errors especially at extreme ends of the range of scales. At zero scale there is a fixed investment charge when there should be no charge and so the cost is <u>overestimated</u> at low scales: similarly at very high scales. At scales between the minimum and maximum the linear approximation <u>underestimates</u> the true scale.



For these reasons, some form of sensitivity analysis is again imperative.

(3) <u>Transport Costs</u>: these must be estimated empirically on the basis of locally available information. This becomes complex where port costs are involved as well as land journeys and in practice it was found advisable to calculate with "high" and "low" estimates.

(4) <u>Prices in general</u>: the whole price structure is assumed to be static and constant but the process of transformation may drastically effect the level of wages and import costs over time.

(5) <u>Uniform objective function</u>: it is implicitly assumed that all countries have the same goal (cost minimisation, growth maximisation etc.) though, in fact, some may ascribe greater importance to employment per se, stability etc.

(6) <u>An "Open" Economy</u>: imports and exports from outside the region can be introduced without a great deal of difficulty. Imports solve the function in the model of supplying final product requirements or intermediate products requirements thereby easing the capacity constraint. Exports

remove the limitations of a specified market. In practice it makes the problem more manageable to assume that 'the rest of the world' is a homogenous market or source which takes products at a given price, or supplies at a given price.

(7) Static or Dynamic Assumptions: the basic framework of the models described so far has been to look at the spatial aspect by excluding the time factor. We have been concerned to minimise the cost of serving a market given at a point in time. The dynamic problem in a closed economic system (as defined above) is simply described: to what extent is it desirable to select a capacity for a proposed plant above present requirements in anticipation of the growth of the market? (1) A large plant, of larger capacity than present demand, will enjoy economies of scale, but will operate below full capacity initially, when heavy fixed charges will have to be carried. Conversely a plant which is relatively small will have better capacity utilisation but less economies of scale, and will require earlier supplementation. Time phasing thus presents a problem with or without the possibility of trade between regions of a country or with the outside world.

Trade has the effect of permitting imports from neighbouring plants when domestic plants have reached full capacity; and, by exports, of allowing better utilisation of capacity in large plants which is in excess of domestic needs. In this way better economies of scale and plant utilisation can be achieved (with a transport penalty) if investment is staggered to accommodate the intentions of neighbours as well as the domestic producer.

The object of this study is to develop a capacity planning model which encompasses three factors: dynamic changes, spatial patterns and the structure of costs, coordinated simultaneously. There have been various attempts to

(1) A. Manne: "Investment for Capacity Expansion" op. cit. Ch. 1 & 2.

relate these different dimensions.(1) Non-linear models with a dynamic aspect present several problems which do not exist for static problems:

(i) it is necessary to compare future streams of expenditure and receipts to present values (or terminal values if a fixed point of comparison is envisaged). For this purpose time discounting has considerable advantages.(2) However, there is likely to be uncertainty over the rate of discount to be used.

(ii) cost and demand estimates need to be projected under conditions of uncertainty in demand and of technical change in supply. Uncertainty is of necessity assumed away and this limitation can only be partially rectified by sensitivity analysis.

(iii) time periods need to be specified, as a basis for comparison. It is necessary, within these time periods, to specify discrete intervals, within which all activities are assumed to remain constant. Time being infinitely divisible, this assumption is inescapable and we would normally take a year as the minimum indivisible time period. The maximum time horizon needs to be sufficiently large to allow consideration of a reasonable array of different plant sizes but not too large to make projections totally meaningless.

Victoritz and Manne showed how, of the various attempts to deal with these problems, a comparative static approach could be employed, using essentially the same static model described above but analysing the effects of increases of demand for given future points in time.(3) Another relevant study was that by Ghosh of the Indian cement industry.(4) By excluding

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(1) Reviewed in D. Enkenlotter: "Pre-investment Planning for Capacity Expansion: a Multi-location Dynamic Model" op.cit. Ch. 1.

(2) E.g. S. Marglin: "The Social rate of discount and the optimal rate of savings" Quarterly Journal of Economics, Feb. 1963, .

(3) T. Victoritz and A. Manne: "Chemical Processes: Plant Location and Economies of Scale" op.cit.

(4) A. Ghosh: "Efficiency in Location and Inter-regional flows: the Indian Cement Industry During the Five Year Plans 1950-59" op.cit.

economies of scale, Ghosh was able to employ a conventional linear programming approach with demand rising through time to obtain a solution which minimised the present value (discounted) of proportional manufacturing and transport costs.

Kendrick, studying the Brazilian steel industry, incorporated non-convexities into a model which was concerned with the output and investment decisions needing to be faced by three steel mills, with seven major production units, each making four steel products.(1) He tried, first of all, a linear programming model run over time (similar to that of Ghosh) and assumed away indivisible capital investment as a sunk cost. He then used an integer programming approach to compare the costs of meeting a given demand, using different combinations of twenty-three "investment opportunities" each referring to a specific size, location, time period of initiation and completion, considering a total time horizon of 7½ years divided into three discreet periods.

The basic problem we encounter in these various models is what Erkenlotter calls the "curse of dimensionality";(2) that it is impossible to deal with the multiple aspects of a model which approaches the real world situation without making solutions computationally impossible even with an electronic computer. With each additional producer location, for example, the number of possibilities increases exponentially.

One is forced back, therefore, on simplifications and approximation techniques. One of the most relevant appeared to be that of Manne. He made the simplification that there was a constant cycle length between investments in a given location, with an arithmetically growing demand in a single location model this cycle length is in fact the optimal solution. Where

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(1) D. Kendrick: "Programming Investment in the Process Industry" op.cit. p. 7.

(2) D. Erkenlotter: "Pre-Investment Planning for Capacity Expansion: a Multi-Location Dynamic Model" p. 9.

multiple production points are considered, cycle lengths vary as between locations. Manne made the further simplification of taking a twenty-four year "major" cycle within which the minor cycles were contained, each multiples of one year. The model called SLOT was solved by zero-one integer programming, by assigning zero-one variables to each combination of minor cycle lengths and initial starting times, and finding the combination which gave the minimum discounted costs over a "major cycle". The solution was Reuristic, not guaranteed to give optimal results but sufficiently close to optimal solutions, otherwise arrived at, to be regarded as a reasonable approximation. Manne considered that errors of simplification and methodology were small compared with the degree of error in the data.

The model can be summarised as possible:

(i) We take a producing area in which there are several producing sites (i_1 i_2 i_3 ... i_n) and several consuming areas (j_1 j_2 ... j_n).

(ii) the discount rate is r, a constant.

(iii) as in the static model, proportional (including transport) unit costs can be represented as cij and the number of units transported is xij.

(iv) the investment costs at any plant are characterised by economies of scale such that $I_i = K (A_i)^{\alpha}$

or

$I_i = B + \alpha A_i$, where A_i is the plant capacity (not necessarily equal to output), and where $1 > \alpha > 0$. Note that it is not necessary to linearise the economies of scale function.

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(1) This meant that the following possible cycle lengths could be evaluated; 1, 2, 3, 4, 6, 8, 12 years, each of which is divisible into 24.

(v) plant life can be assumed to have constant or infinite life. Replacement complicates matters slightly but not fundamentally. Similarly extensions from additions to existing plant rather than greenfield site development are excluded but present no fundamental difficulty.

(vi) demand in the consuming area j grows by equal annual increments of D_j or D_i in the case where the market at the producing location is being considered.

(vii) there is no excess capacity at time (t) = 0 or where t = T, where T is the length of the major cycle. T = 24 years in the Manne study. 24 Years was considered long enough to consider a variety of cycle lengths, but not too long, such that the constants (r, cij and D_j) should become unrealistic.

(viii) each producing region has a constant time cycle for the phasing in of new plants, q, and the first construction is started after year p. P_i and q_i are integers representing discreet time periods: one year or a multiple thereof. The number of plants existing at any point in time at i is w_i; such that

$W_i = 0$ from $t = 0$ to $t = q$
$W_i = 1$ from $t = q$ to $t = q + p$
$W_i = 2$ from $t = q + p$ to $t = q + 2p$ .....
$W_i = \frac{T}{p}$ where $24 = T$

(ix) it is also necessary to introduce an integer variable ϕ_{ik} where k is an index representing every combination of cycle lengths and on stream dates.

The objective function to minimise then is

$$\sum_t r \left(\sum_i w_i I_i \cdot \phi_{ik}\right) + \sum_i \sum_j cij \cdot xij \quad \ldots\ldots (1)$$

where $xij \geq 0$ ..... (2)

and where capacity is always adequate to meet peak demand at time t. $\sum_i w_i A_i > t \sum_j D_j$ .... (3)

ϕ_{ik} and w are integer variables .... (4)

r and cij are constant .... (5)

CASE STUDIES

Choice of cases:

It was decided to concentrate on two already established industries, cement and petrol refining, which receive a detailed case study treatment in special appendices. What follows is an abbreviated summary of the studies. The reasons for choosing the two countries are the following:

(a) they are well established industries with a good body of data to draw upon both in terms of production costs and from the regional experience of intraregional trade.

It could be argued that the issue is academic as each of the five countries have now 'gone it alone' in developing their own refining and cement production capacity. However it is necessary to isolate two quite different questions. First, there is the "static" question of whether, given the existence of high fixed capital costs in cement production, there should be 1, 2, 3, 4, 5 .... or producers. Second, there is the "dynamic" question of whether, given a group of 'national' producers, any expansion of capacity can be phased to give a better degree of utilisation taking into account the possibilities for regional trade and a planned staggering of investment.

(b) both industries are key 'building block' industries. The cement industry has a high 'local content' and refining has important 'forward linkages' to petrochemicals; while both have a significant role in import substitution.

(c) both manifest important economies of scale but in both cases also the centrifugal forces of high transport costs are sufficiently substantial to balance the centripetal forces of scale economies in labour and capital costs. So, centralisation is not a self evident solution as it would be with high unit value products.

Hypothesis

The specific hypothesis to be tested by the model is that 'national' rather than 'regional' development has produced an inefficient and costly distribution of excessively small sized and underutilised plant. There is a priori evidence of several kinds.

First, there are five cement plants in Central America with a combined capacity of about 1·2 m tons p.a. (1972) for a market of about 800,000 tons. There are about 15 kilns in total. Yet most modern plants in industrialised countries would now install single kilns of 500,000 tons capacity or more. The oil refineries are even more glaringly suboptimal in scale. There are six, with a total capacity of 80,000 barrels a day, while the most popular range for single refineries is 40,000 to 60,000 bs. in most developing countries and the best economies if scale are obtained over 100,000 bs. (see map.)

Second, capacity utilisation is very low. For cement, utilisation rates rarely exceed 70% taken year by year and are usually below. This is for a continuous process industry where there is little peaking problem. 90% utilisation of capacity is considered normal in industrialised countries. For the oil refineries, the average use of the six refineries since their start-up has been about 50%, as compared with the 95% use of overall refining capacity by a major company (Shell). This is not merely a transitional phenomenon: estimates made in the appendix indicate that if present plans are carried through, the situation will deteriorate rather than improve, especially in oil refining.

Third, prices are high by international standards although labour and many other costs are lower. The average market price per bag of cement was until recently around $1·50 as compared with Mexico City (circa 90c),

Map showing the distribution of oil refineries in Central America

in India (circa 65c in the main cities) and much lower levels in industrialised countries (circa 65c in the U.K.). Cement is protected by a nominal tariff of 50% which is exceedingly large considering that imported cement carries a high transport cost penalty. The 'protection' of petroleum products is more difficult to prove because of the transfer pricing practices of the multinational oil companies. As we show in the appendix part of the 'cost' of duplication is carried in reduced local refining profit margins (profit continuing to be made on the crude oil), and partly in lower government tax revenues. There are however tariffs on gasoline of up to 10%, losses of discounts on fuel oil and quantity controls. The hypothesis was then tested, using the model described above, with the intention of establishing whether some or all of the observed inefficiency of the industry, was due to a serious duplication of plant.

Data Used

The special appendices spell out in considerable detail the methods used in compiling usable data. The following data simplifications had to be made:

(1) Demand: we had to assume that markets were concentrated in a fixed number of discreet points (usually six or seven) in order to reduce the problem to manageable proportions. The way in which demand for basic materials is concentrated in fact in a few industrial complexes (the capital cities plus San Pedro Sula) tends to validate this assumption. Demand was also assumed to be price inelastic. This must be substantially true since substitutes are not easily available for cement and petroleum products and these goods are, furthermore, usually a small part of the total current or capital cost of a project.

Projections of demand were made for 1970 (now confirmed by current data) and 1975. Simple regression methods were used involving G.N.P. as an

independent variable or a time trend projection. Because of the likely range of error, a "maximum" and "minimum" estimate was used.

(II) Transport Costs: data here is patchy and varies considerably depending upon different vehicle sizes, on particular road quality, and on the contractual agreement with the transporters (for single or return journey etc.). An attempt was made to find out from local agencies the various 'least cost' alternatives and a matrix of journey costs between all the possible production sites and markets was compiled. Again "high" and "low" estimates were obtained.

There was one major complicating factor in that there was an option for long distance journeys of using sea rather than road transport. This involved separately calculating port and sea transport costs from rather unreliable sources.

(III) Sources of Supply: because of the existing facilities it was felt useful to use present production sites as representing the range of possible alternatives. Imports were also included as another source of supply at constant proportional costs. We assumed that exports to the world market did not represent a feasible option.

(IV) Proportional Costs: each site has different, albeit constant, costs of production, for raw materials, elasticity fuel etc. Interviews with the firms in question usually produced the information sought.

(V) Economies of Scale (non-proportional costs): for reasons already set out in some detail economies of scale are difficult to quantify precisely, even before the linearisation procedure; especially so as there is a profileration of engineering and economic data for each industry which is not mutually consistent.

Diagrams 5-1 and 5-2 summarise the main data sources for economies of scale in investment costs. In practice alternative functions need to

Diagram 5-1

Refinery Size and Investment Cost

Size of Refinery	McLean + Haigh[1] (1950)	Garner[2] (1962)	Manne[4] (circa 1960)	Pratten[5] (1971) (a) Index	(b)	Shell[6] (1971) Index	Hubbard[3] (1962)
5,000 bd.	$12.5m.	-	$ 7.3m				$18m.
10,000 bd.	-	5 m.	10 m.			130	-
20,000 bd.	-	9.3 m.	15.5m.	100	100	100	-
30,000 bd.	25 m.	14 m.	-				-
40,000 bd.	-	16.5 m.	-	85	75	77	40m.
50,000 bd.	-	21.5 m.	27 m.				-
60,000 bd.	40 m.	25 m.	-				-
70,000 bd.	-		-				-
80,000 bd.	-		-			58	62m.
90,000 bd.	-		-				-
100,000 bd.	60 m.	39 m.	40 m;	66	56	53	-
120,000 bd.	-		-				80m.
150,000 bd.	-		-				-
200,000 bd.	110 m.		-	52	44		-
400,000 bd.	-		-		40		-
Scale Coefficient	.71	.80	.66	.66	.59	.57	.58

1. McLean & Haigh: "The Growth of Integrated Oil Companies" op.cit.
2. Garner in United Nations Seminar: "Techniques of Petroleum Development" op.cit. p.192.
3. Hubbard in " " " " " " " p.218.
4. A. Manne: "Programming Data for the Petroleum Refining Industry" in "Industrialisation and Productivity" Bulletin No. 10, pp.57-74.
5. C. Pratten: "Economies of Scale in Manufacturing Industry" op.cit. Ch.4, and Pratten and Dean "The Economies of Scale in British Industry (Introductory)" 1965.
6. Shell Oil Company: unpublished estimates.

Table 5-2

Investment Costs in $m (1963)

Capacity T.p.a.	W. Germany[a]	U.S.A.[b]	India[c]	"Typical" LDC[d]	
				I	II
33,000	1.6				
66,000	2.3			2/2.5	
100,000	3.0	6.5	3.6	3.5/4	4/4.7
200,000	4.8	10.8	6.4	6/7	8.5
300,000			9.0		
400,000	7.6	18.0	10.8	10/12	14
500,000		21.5			
1,000,000		30.0			

Central American fixed investment figures are:

Guatemala:	140,000 T (1962) - $6m.	310,000 T - $10m. (1969)
El Salvador:	90,000 T (1962) = $3m.	
Honduras:	210,000 T (1968) = $10m.	
Nicaragua:	235,000 T (1968) = $11.6m.	
Costa Rica:	115,000 T (1968) = $6m.	

From U.N. "Studies in the Economics of Industry; Cement" etc." op. cit

(a) Dry process: excl. clearing land etc.

(b) Wet process - includes elaborate buildings; covers large amount of quantity control equipment, dust control equipment and electrical machinery

(c) 1963 Prices - United Nations "Industrial Development in Asia and the Far East". op.cit. p.63.

(d) "Minimum costs" for developing countries (I) based on estimates of major companies. (II) based on a sampling of firms in LDC's.

be taken to cover the various estimates of the scale function. This was somewhat easier for cement since the U.N. has provided a 'standard' profile for LDC's, but for oil refining the possible variations in the complexity even of simple, non-cracking refineries makes the standardisation of estimates difficult. The technique used to ensure that the scale function represented Central America costs was to assume that while the function (or the linear approximation to the scale function) had the same gradient, it passed through a point representing Central American data.(1)

In both models it was necessary to reduce the investment cost to an annual charge which involved making assumptions about likely depreciation, maintenance and rate of return. And the static model required linear approximation of the function. Both of these procedures involved a margin of error and required a further spread from a "high" to a "low" estimate of capital costs.

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(1) This technique is used by Ana Martirena de Martel: "Integracion y el economico de escala" op. cit. Also used in M. Carnoy (ECIEL Study) "Industrialisation in a Latin American Common Market" op. cit. Ch. 9.

As regards the size of establishments, we variously assume full use of capacity and a given degree of underutilisation.

Labour costs are even more difficult since there is no 'standard' cost relationship: too much depends on the manning and productivity of each plant. Fortunately, labour costs are a trivial proportion of total refining costs and not too high for the cement case: in the cement example an attempt was made to derive a scale function, linearise it and include it in the calculation.

Results.

1. First let us take the "static" example. In the cement (refining) case the model was run on six (eight) different sets of assumptions; for economies of scale, degree of plant utilisation, transport costs and demand. Clearly this does not exhaust the possibilities for sensitivity analysis but it does give some basis for evaluating the significance of different types of error.

The type of print-out obtained for each estimation is summarised for cement in Diagran 5-3, in a highly appreviated form, giving some of the more interesting configurations. The "saving" of optimal over present plant distribution in case I is £2·1m. p.a. or 10% over delivered costs.

The overall results signify the following. In neither industry is the present near-autarchy optimal. However the "optimal" solution represents an overall improvement in cost of production and transportation of 5 to 15% in the cement case; and a similar amount (with a slightly greater range of error) in the petroleum refining case. This may not seem high but one should remember that in both industries a high proportion of the

Diagram 53

Results

Assumption I

Configuration	Cost in $m.
*01001	17.95
*11001	18.00
10001	18.275
10101	18.375
01101	18.60
*11101	18.835
01011	19.065
10011	19.116
11011	19.275
10111	19.60
01111	19.80
*11111	20.05
01010	20.255
10010	20.40
11010	20.50
10110	20.755
01110	20.975
11110	21.225
00101	21.975
*01000<u>1</u>	22.160
*01000	22.3
00111	22.335
01000	22.35
11000<u>1</u>	22.40
10100<u>1</u>	22.47
11000	22.56
10100	22.79
10000<u>1</u>	22.91
11100<u>1</u>	23.00
11100	23.06

Assumption II

Configuration		Cost in $m.
*11001		19.475
*11101		19.60
*11111		20.05
10111		20.45
*01001		20.74
.....		.....
.....		.....
11100<u>1</u>	(Best imports)	23.00
.....		.....
.....		.....
01000	(Best single location)	27.78

Assumption III

*11001	22.50
*11101	22.95
*01001	23.42
10001	23.535
10101	23.84
*11111	23.85
01101	23.885
10111	23.90
10011	23.925
.....	.....
.....	.....
11100<u>1</u>	27.0
10100<u>1</u>	27.0
11000<u>1</u>	27.15
.....	.....
01000	30.03

Cont'd.

00110	23.51
10000	23.57
00011	24.35
00010	24.89
001001	25.15
000101	25.53
00100	25.88
000011	26.36
00001	26.71
000001	35.34

Assumption IV

*11001	22.755
*01001	23.000
*11101	23.195
10101	23.195
01101	23.435
*11111	23.88
.....	.....
.....	.....
110001	26.3
.....	.....
*01000	27.27

Assumption V

*01001	20.425
10001	20.75
*11001	20.825
10101	21.175
01011	21.89
.....	.....
*11011	22.56
.....	.....
*11111	23.65
.....	.....
010001	24.31
01000	24.46

Assumption VI

11001	22.755
01001	23.00
100011	23.145
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
000001	28.1

cost is proportional to output - notably crude oil in refining.

In the petroleum refining case the "best" solution was a single refinery on the Atlantic side in Costa Rica but if assumptions were changed to give a lower weight to capital costs then a two refinery solution was optimal. For the cement industry case, on all assumptions, a single plant would be grossly sub optimal and the best solutions was a two plant set-up (in Salvador and Costa Rica) with a third in the case where capital costs are given a lower weighting. If the tariff could be lowered to 15% for cement then imports could be more attractive in the peripheral areas and this would make the single plant option less costly.

In an attempt to narrow the range of error the bias introduced by linearisation of the economies of scale function was correct and for one or two of the examples. The effect of the bias is to exaggerate the capital costs of the centralised and autarchic solutions and to understate the capital costs of the two/three/four plant solutions.

The main implications of the study is that notwithstanding the range of error in estimations, there is unambiguously a loss in efficiency from the autarchic solution which probably is about 10% of the average delivered price of the commodities (excluding tax and distributors markup). The advantages of centralisation seem more obvious in oil refining since bulk transportation of products by sea means there is not such a transport cost diseconomy as for cement.

In practice the closure of existing plant in the interest of rationalisation is not likely to appeal and so for this reason the time-planning model is employed as means of establishing the benefits from future rationalisation.

2. This involved slightly different use of data, and a different set of

assumptions. A discount rate of 10% is assumed; 15% for sensitivity purposes. The annual demand in cement, is constant, based on an arithmetic increase. We also assume that every second investment is an additional kiln (or refining unit). As before, a series of estimates was made based on "high" and "low" investment and transport costs.

An example will be taken from the various runs for the cement industry. If we take initially a discount rate of 10% and low transport costs, and, take the best of three ordering combinations and compare it with the 'closed' solution, we get:

	Open Solution – with trade		Closed Solution	
Total Discounted Costs ($m.)				
Terminal Value	80·463		85·034	
Of which manufacturing costs are	62·275		74·68	
Of which transport costs are	18·187	(intraregional trading costs)	10·350	(costs within national boundaries)

The following combination of time cycles and phasing was indicated:

	Open			Closed		
	cycle	start	size	cycle	start	size
Location 1	24yrs.	yr. 1	600,000	4 yrs.	1st yr.	100,000 tons
2	24 "	" 15	408,000	4 yrs.	" "	68,000 "
3	12 "	" 10	168,000	4 "	" "	56,000 "
4	12 "	" 6	144,000	4 "	" "	48,000 "
5	6 "	" 2	108,000	4 "	" "	72,000 "

It can be seen that there are advantages to be derived from a coordinated approach. Optimum time cycles are considerably lengthened by allowing the possibility of trade and the optimum kiln size very substantially increased in several cases (quadrupled or quintupled) to permit economies of scale in

manufacturing and labour costs. However, transport costs rise rapidly too with increased interchange and almost offset the potential gains, though on balance, deferring construction and incurring a transport cost penalty is beneficial. There are small proportional costs to be considered too, but on the assumptions chosen about 5 - 7% of cement costs could be saved, with a time phasing policy. As we have only considered a very small number of ordering sequences (6) it is very likely that a better sequence could be found.

What this "optimum" solution implies is that Guatemala effectively becomes the main regional producer of cement for the next five years planning period, with Costa Rica supplying itself and Nicaragua. In the sixth year Nicaragua produces initially for export, but later for self-sufficiency apart from some supplies to Tegucigalpa.

In the following diagram one can see the importance of international trade under the "optimum" system.

	Trade	Production (over year 0)
Year I	61,000T	86,000T
2	86,000T	172,000T
3	129,000T	258,000T
4	172,000T	344,000T
5	215,000T	430,000T
6	186,000T	516,000T
7	235,000T	602,000T
8	240,000T	630,000T
9	280,000T	774,000T
10	170,000T	860,000T
11	187,000T	946,000T
12	204,000T	1,032,600T
13	265,000T	1,118,000T
14	290,000T	1,204,000T
15	78,000T	1,290,000T
16	102,000T	1,376,000T
17	130,000T	1,462,000T
18	84,000T	1,548,000T
19	116,000T	1,634,000T
20	112,000T	1,716,000T
21	126,000T	1,798,000T
22	-	1,880,000T
23	-	1,962,000T
24	-	2,044,000T

The level of trade rises to a peak of nearly 300,000T declining towards the end of the cycle (the fixed cycle concept artificially deflates the later predictions of trade). Certainly, far more trade is envisaged than at present or in the recent past - and this excludes border or seasonal traffic.

However, it is worth looking at some of the simplifications that have been made to see how the results would be affected. One of the significant features, and weaknesses of the exercise, is that the results

are susceptible to the influence of whatever sequence is used for examining the regions. Six sequences were examined giving the following total costs:

	(£'000)	
1, 2, 3, 4, 5	83·505	
5, 4, 3, 2, 1	80·463	(chosen)
4, 1, 3, 5, 2	82·871	
3, 2, 5, 1, 4	83·544	
5, 1, 4, 3, 2	84·389	
2, 1, 4, 5, 3	83·768	

Had a more exhaustive analysis been carried out a lower "optimum" might have been reached. If a discount rate of 15% is taken, this does not greatly affect the relative advantage/disadvantage of centralised/decentralised solutions but the overall magnitude of costs is considerably affected. If a higher set of transport costs are taken a more decentralised pattern is made to look slightly more attractive. On the other hand a higher estimate of economies of scale would make the centralised pattern more attractive.

These results, and similar results for oil refining indicate the type of gains that could be obtained from a staggering of investment.

However, this still leaves the question of how individual states might be affected.

The distribution of gains.

An effort has been made to show the type of magnitude of gains from rationalisation. What might this mean for individual partner states? If we take first of all the "static" example and calculate straightforward income gains and losses, ignoring for the moment foreign exchange savings

and employment effects. In the case where there are unemployed resources the countries which do specialise have an income gain and the countries which surrender production lose; their loss being offset by gains from cheaper products assuming that a pricing system is to distribute gains from more economical production. Let us take just one example, cement, where the optimal solution produces gains of about $3m. p.a. in straight cost reduction, on the basis of production in a 560,000 Ton per annum factory in El Salvador and 270,000 Ton p.a. in Costa Rica.

However, the turnover of production is not a measure of "income gains" which is perhaps more appropriately measured by local (i.e. Central American) value added plus the value of local raw materials (and any subsequent multiplier). If the consumption gains were spread in proportion to the market and appropriate assumptions made on costs the following picture emerged.

	Welfare (Consumption) Gain	Gain/loss to National Income (in production and transport)
Guatemala	+1·0m	$ - 3·0m
El Salvador	+ ·75m	$ + 4·0m
Honduras	+ · 3m	$ - 1,85m
Nicaragua	+ · 3m	$ - 1·75m
Costa Rica	+ · 6m	$ + 1·20m

It can be seen that gains are of a smaller magnitude altogether than the losses from totally ceasing production in one or two countries and for this reason above it is difficult to see how this solution could commend itself in practical terms. A similar table could constructed for all the possible assumptions; but the same type of result would be likely to emerge.

In the oil refining case, the 'national income' content in production is very much less, since refining consists largely of the use of imported raw materials and capital equipment. In this case, if we take the example of the "optimal" single refinery at Costa Rica and contrast it with the case

where there are national refineries under the set of assumptions where overall gain is about 10% (sales $8·5m p.a.), the following picture emerges:

	Welfare (Consumption) Gain	Gain/loss to National Income
Guatemala	$2·8m	$ - .9m
El Salvador	1·30m	- ·45m
Honduras	1·85m	- ·5m
Nicaragua	1·30m	- ·45m
Costa Rica	1·25m	+2·3m

In this case the "gains" are much more evident than the loss to national income from winding upon existing plant.

Another way to look at the problem is entirely in terms of foreign exchange saving. This will depend largely upon 'import content' of production. In the above (cement) example about ½ of all costs are 'local' which correspondingly reduces the value of the 'savings', relative to'national' production, but for petroleum products almost all costs of production and transportation are 'foreign', so raising the magnitude of net foreign exchange savings.

From a practical point of view, employment considerations are likely to loom large and it can be seen that rationalisation will inevitably lead to a net contraction of employment in the industry; and of substantial magnitude in individual countries. This is unlikely to be politically acceptable in any event especially for major employers like cement works.

For this last reason in particular it is perhaps reasonable to assume that the cost of reconstructing are likely to be sufficiently large, especially in employment terms, to outweigh the gains; certainly in the cement case. For this reason there is practical virtue in looking at future planning. The method of assessing the distribution of gains would be the same albeit more complex when considered as a flow of future returns.

The basis of a regional investment policy

Assuming that it is possible to calculate gains and losses satisfactorily this still leaves us with the need for a basis for 'trading off' these gains and losses over a substantial number of projects.

Though no attempt is made here to work out the results of a full investment policy involving several industries, it is clear that a good deal more is involved than combining the optima of individual sectors:(1)

(i) such a solution ignores the 'equity' objective of the investment policy. A constraint would need to be introduced to ensure at least a minimum pay-off for all the partners. While this would not give us a global optimum; at very least, the 'second best' solutions could be quantified, in overall income terms or foreign exchange savings.

(ii) a major problem would present itself with the pricing of products. Hitherto we have rather blandly assumed that trans-national pricing would distribute the benefits of increased efficiency between the consuming states. This is just a little too cavalier an assumption given that most of the firms are probably owned by overseas investors. These firms are concerned with maximising global profits not with any Central American welfare criterion; and under the investment policy their degree of monopoly power in Central America is increased. Yet, unless a 'controlled' pricing system is introduced this could drastically effect the distribution of benefits and the trado balance between states. It is unavoidable therefore that the type of pricing control operated under the Integration Industries Agreement be enforced, based on cost guidelines.(2) This could create difficulties in as much as it circumscribes the potential profitability of overseas investors and for this reason a substantial government stake might be necessary in these key industries.(3)

(1) There is a good deal of useful discussion of the problems of an investment policy in this context by J. Baranson: "The Role of Multinational Companies in Latin American Integration" Heath 1972.

(2) One effort to work through the implications of such an exercise is contained in R. Robson: "Project Evaluation of Multinational Plants in Africa" Journal

P.T.O.

of Industrial Economics 1971, pp.105-111.

(3) There is a whole variety of organisational possibilities from purely privately owned multinational companies, to multinational state enterprises, and multinational joint ventures which are being explored in the Andean group and have been discussed in J. Baranson ibid and I.M.D. Little: "Regional International Companies as an Approach to Economic Integration" Journal of Common Market Studies, Dec. 1966.

This pricing problem would be further complicated if exchange rates were allowed to fluctuate in the region. This is not a completely insurmountable problem (the EEC agricultural policy has survived despite several parity changes) and it could serve as an impetus to closer monetary integration, already fairly well advanced in Central America.

(iii) so far we have been concerned with rather simplified industrial structures, ignoring input-output connections and the possibilities for 'external economies'. In petroleum refining in particular the gains from centralisation are greater than this simplified analysis might indicate. The construction of six refineries has stifled the emergence of a petrochemicals industry based on local feedstock, which would have been possible for a 40,000 or 50,000 bd. refinery based, say, in Costa Rica. This has gravely impaired the prospects for plants producing PVC, polyethylene and ammonia using local naptha and generating considerable value added for the region.

Conclusion.

The two cases chosen, most notably the oil refining case, demonstrate the diseconomies of the present unplanned policy and the advantages of rationalisation. Even given the questionable nature of some of the assumptions, positive conclusions emerge and it is inferred that a policy could be devised quantifying the gains and losses in particular sectors and trading them off.

General Conclusions and Policy Implications of the Case Studies

Much of the basic argument of the thesis has been developed and summarised on a chapter-by-chapter basis. However, it is worth trying to draw some general conclusions, and particularly from the case studies.

In Chapter 4, it was argued that a regional investment policy involving the planned location and time phasing of investment was a necessary condition for the development of basic intermediate and capital goods industry given the existence of substantial economies of scale and very small markets. Such a regional investment policy would focus on a few sectors or industries at a time rather than at all aspects of possible trade.

If a purely ad hoc allocation and bargaining procedure were to be used, economies of scale might well be outweighed by uneconomic locational choice and little would be gained unless these locations were chosen explicitly to compensate the 'backward' parts of the Common Market to compensate for other losses from membership.

Various attempts were made to see how precisely the gains from a planned allocation could be quantified. The use of both static and dynamic models was employed. For the cement industry where the centrifugal influence of transport costs is powerful it was still found after a detailed consideration of likely costs, that cost savings (overall) of about 10 per cent might be achieved, by either reducing the number of plants or else staggering expansions from existing plants. For oil refining, the refining cost is a small element of the wholesale (let alone retail) price but even then a significant saving (5-10 per cent) could be made if a single refinery were used at Limón (Costa Rica) or in Panama; also there would be savings

in respect of petrochemical feedstock. In both cases the 'status quo' would have to be taken as given and time phasing is, in practice, the only way in which practical savings could be made at this stage.

Further Research

Further work could be done both by extending the scope of the case studies and adapting the methodology.

1. The more industries that could be studied and costs quantified, the more a meaningful picture could emerge, and the greater the prospects for successful 'bargaining' and trading-off of alternative projects. Ultimately it would be necessary to programme a cost minimisation solution for a whole set of local -(industry-wide)- optima, taking into account vertical linkages as well as possibilities for inter-industry specialisation.

An attempt to broaden the range of industries studied was made, for caustic soda, paper, iron and steel and plate glass. Most of those industries do not presently exist and the information is hypothetical - except for the caustic soda plant. For this reason they were not incorporated in the main thesis, though provisional results lend considerable support to the argument for joint phasing to rationalise future industrial investment.

2. The programming exercise could easily be modified and improved. Sensitivity analysis was a little crude, and it could be argued that the variability of results did not justify the precision obtained by using an electronic computer. Within the framework of the models employed, it would be interesting to look at

(i) the effect of increasing the number of discrete markets and therefore of potential journeys,

(ii) the effect of incorporating geometric market growth in the capacity expansion model.

However, it was considered that the cost and time involved in reprogramming the model for the computer was unjustified in view of the inherent uncertainty over data and particularly over the elusive economies of scale function.

3. Very little was done to experiment with different 'sharing arrangements' or bargaining solutions. To do this would involve consideration possibly of 'game theory' or less formal techniques designed to obtain a maximum benefit solution subject to constraints. It is out of this that a comprehensive regional investment policy might emerge.

The management of the 'trade-off' process could be a very complex one. Also, in addition to 'gains' and 'losses' being assessed in income terms there might also be a call to achieve balance in respect of employment creation, technology transfer or foreign exchange saving.

Policy Implications

In both aggregated and disaggregated - industry by industry - terms it has been shown that unplanned and uncoordinated industrial development in economies of scale industries would be most likely to lead to a wastage of scarce capital (and of foreign exchange) and an unsatisfactory agglomeration of activity in already favoured locations. It is difficult to see how any other solution than a 'regional investment policy' could be effective.

The major criticism of my conclusion would be that it is "politically

unrealistic": governments will not accept such a loss of sovereignity, and those that do are of doubtful longevity. That could be true. But governments who find it "politically unrealistic" to accept a regional investment policy would in all probability find it equally difficult to accept substantial fiscal transfers to countries only marginally poorer than themselves; or to accept the loss of sovereignity which is involved in any economic union which goes further than tariff reduction. It may well be that economic integration between developing countries in general is unrealistic if the participants are unwilling to accept its implications. If that is the case, then a great deal of effort is being expended in vain. This in turn raises once again the whole question of the rationale for integration and the (very limited) options.

Where this thesis tries to break new ground is to take the case of the Central American Common Market not in its optimistic, burgeoning, phase as others have done, but after a serious crisis; and it tries to explain how unequal gains generated by market forces quickly lead to disintegration.

The moral would appear to be that 'economic nationalism' which the modern theory of customs unions takes as its starting point, is also the reason why customs unions founder. The effort of small countries to establish their own industrial base can only be done conjointly with other nations with similar characteristics, and in a manner that requires a higher degree of cooperative effort and planned resource allocation than has been evolved in Central America or in any other regional arrangement yet devised. If this response is not forthcoming then the Central Americans, and most other small nations, will have to rid themselves of the illusion that they can industrialize meaningfully by substituting imports of manufactures.

Appendix I.

Deficiencies in Central American Statistical Data

Economic researchers in developing countries need to be mindful not only of the normal hazards of using economic data, as outlined by Morgenstern;[1] but of the additional problems which arise when working in countries where statistical services are weak, much of the economy is non-monetised, and communications poor.[2] Central American Governments are if anything more inefficient, inexpert and corrupt than most others and this will inevitably be reflected in the data. The fact that in some countries statistical offices and Central Banks (let alone planning bodies) have only been created in the last decade or so, has not helped in getting continuity over time.

Wherever possible the author has tried to check official data with primary sources, but this is difficult. Generally, trade statistics are fairly reliable; population and national income statistics less so; unemployment and agricultural production figures very poor.

(a) Trade Statistics: even in advanced industrial countries such as the U.K., miscalculation of imports and exports has been serious in recent years and there are in all situations problems over such transactions as intra-company trade. Nevertheless, Central American official sources have indicated that they have additional problems in calculating imports, which are important for revenue as well as general statistical purposes:[3]

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1. O. Morgenstern: "On the Accuracy of Economic Observation", Princeton 1963.
2. W. Stolper: "Planning without Facts", Cambridge (Mass) 1966.
3. "Causes of error in external trade in the countries of Central America", Direction General de Estadisticas, Guatemala (Min. de Economia) 1966.

1. Over-rapid rotation of staff leads to inefficiency (rapid rotation is an anti-corruption device).

2. Many forms are not completed properly and others are illegible; attributable partly to general illiteracy and poor quality staff.

3. There is large-scale false declaration, especially under-invoicing of imports, though the predominance of "specific" rather than ad valorum tariffs helps to mitigate the effect of this.

4. There is confusion because of differences between NAUCA, the Central American tariff code, and NUECA, the international goods.

5. Confusion over origin is a problem especially in intra-regional trade.

6. Smuggling is a major industry. Borders are long and poorly guarded and heavy protection of consumer goods provides an incentive. Army officers and senior officials are known to widely abuse their duty-free allowances. Another good example was recent 'cotton-scandal' in Nicaragua when millions of dollars worth of cotton were smuggled out through Costa Rica to avoid export duty while false returns were submitted for exports under the national quota. [1]

One way of illustrating these discrepancies is to take a random sample of items figuring in trade between contiguous countries. There should be no disparity in weight and a small disparity in value reflecting any difference in transport cost between the last point of valuation of exports (f.o.b.) and the first check on import values (c.i.f.). However, the following tables are illustrative.

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1. Economist Intelligence Unit, Quarterly Economic Review, January 1972.

Item	Nicaragua c.i.f. imports from (Costa Rica)		Costa Rica f.o.b. exports (to Nicaragua)			
	A	B	C	D		
	Weight (MT)	Value ($)	Weight	Value	$\frac{A}{C}$	$\frac{B}{D}$
021-01-01-01	1,094	57,816	1,017	50,955	1·07	1·11
042-02-00	1,407	195,900	1,220	156,000	1·09	1·20
044-01-00	2,024	165,500	1,802	124,500	1·12	1·32
051-01-01	13,055	459,123	11,951	294,000	1·05	1·56
091-02-02	2,231	1,142,000	1,886	897,000	1·19	1·27
561-01-07	1,861	149,840	2,067	176,200	·90	·85
02-00)						
03-00)	5,918	588,750	10,318	1,042,000	·57	·56
09-00)						
681-07-00	2m395	648,500	2,513	618,000	·95	1·05

	El Salvador c.i.f. imports (from Honduras)		Honduras f.o.b. exports (to El Salvador)			
	A	B	C	D		
	Weight (MT)	Value ($)	Weight	Value	$\frac{A}{C}$	$\frac{B}{D}$
661-02-00	23,741	801,000	24,490	558,000	·96	1·4
552-02-03	3,445	980,000	2,344	776,000	1·45	1·26
243-02-00	43,074	1,530,000	43,925	990,900	·98	1·56
061-04-00	1,393,000	23,400	1,342,000	18,725	1·04	1·26
121-01-00	1,531,000	488,000	1,443,000	439,500	1·06	1·08
054-62-01	13,990	2,700,000	13,706	2,525,000	1·02	1·07
044-01-00	26,944	5,909,000	26,040	1,967,000	1·04	3·1
001-03-00	2,690	880,000	2,213	821,100	1·21	1·97

Sources: "Commerio Exterior de Nicaragua" 1968.

"Annuario de Commerio Exterior de Costa Rica" 1968.

"Annuario Estadistico" El Salvador 1968.

In practice, there are divergencies of 5 per cent in weight valuation and much more of monetary value. In some cases discrepancies are very large.

While import statistics are more likely to be reliable than export statistics, the latter are important and even the import statistics are far from reliable.

(b) National Income Statistics. These are subject to much greater errors than trade statistics especially when conversion to common currencies and constant prices is involved. An attempt was made by the Joint Planning Mission in 1962 to produce a "corrected" and continuous series for 1950-62 with all countries gives on a comparable basis for comparison, and where possible this series is used. [1]

An estimation of the range of error likely to be encountered can be obtained by looking at the statistics of Guatemala. In 196- there was a revision of the data resulting in a 50-60 per cent "increase" in the G.N.P. (data from U.N. National Accounts Yearbook).

G.N.P. at current market prices (M. quetzales)	1953	1954	1955	1956	1957	1958	1959	1960
I (original)		493	563	623	646	638	651	679
II (revised)	728		807			962	984	1,010

The sources of error in national accounts are likely to occur as follows:
(i) Agriculture: agricultural value added is difficult to calculate because

1. Joint Planning Mission: Historical Statistical Series 1962 (Guatemala).

of the existence of a substantial subsistence sector. [1] Subsistence production can be calculated on an extensive or restrictive basis, and consistency is very difficult to achieve. A recent survey of agricultural statistics in Central America concluded: "the problem of obtaining data plagued the researchers throughout the study. Except for a few years, information on consumption is very scarce in Central America". [2]

No attempt is made to separate agricultural production for export and domestic use, because of statistical difficulties. There are also anomolies because of discrepancies between crop and calendar year.

(ii) Industry: the problem here is also due to the lack of census data, and the proliferation of small units of artisans including many Indians making handicrafts. Censuses have been few and far between (Guatemala three, the last in 1958; El Salvador 1951, 1956, 1961; Nicaragua 1958; Honduras 1966; Costa Rica 1951, 1957, 1964; and a Central American Industrial Survey in 1962) and series are connected by volume indices of dubious reliability and whose relative weighting is likely to change as industrial structure changes. Industrial statistics frequently exclude the large artisan sector. Guatemala's 1958 Census excluded all urban establishment of under five men, and all rural establishments. The Nicaraguan census of 1958 excluded small artisan firms with a value added under $200. The 1962 Central American census excluded firms with under five men.

Commercial, industrial (and agricultural) censuses are subject to large errors due to fiscal fraud when profits are being concealed.

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1. L. Fletcher, E. Graber, W. Merrill and E. Thorbecke: "Guatemala's Economic Development: the role of agriculture". University of Iowa 1970, p.23. This study estimates that the subsistence sector contributes 20 per cent G.N.P. approximately.
Underestimation of subsistence production may lead to errors of substantial

(Footnotes continued on page 6)

With the service sector there are particular difficulties involved in calculating the effect of the partially employed street vendors and others who may have good reason to avoid investigation by the authorities. Capacity utilisation is difficult to calculate meaningfully, and the value of fixed assets. There are problems involved in deciding whether to include in "manufacturing" items such as the processing of coffee, which account for 20% or more of manufacturing value added in some countries.

(iii) Price Indices: in converting to real terms we need good price indices. Most of the countries have consumer price indices, but wholesale price indices are less reliable. Guatemala has comprehensive and multiple price indices,[3] as do El Salvador and Costa Rica. Until recently Honduras and Nicaragua did not appear to have anything more satisfactory as G.D.P. deflators than cost of living indices. Errors are compounded at a sectoral level.

However, the rate of inflation is very small in all countries and small changes are easier to monitor than large ones. This is not an area where errors are serious.

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magnitude. United Nations : "World Economic Survery 1969-70" p.8; S. Kuznets: "Modern Economic Growth" 1966.

2. Batelle Institute U.S. Department of Agriculture: "Projections of supply and demand for selected agricultural products in Central America through 1980", pp.1-3.

3. "Numeros indices de precios en la republica de Guatemala" Direccion General de Estadistica, 1961.

(iv) Exchange Rates: official exchange rates are not entirely suitable for calculating the value of G.D.P. in a common currency such as dollars, even though the Central American currencies are nearly fully convertible. Studies carried out in the 1960's on a "purchasing power parity" basis indicated the following conversion factors. [1]

	ECLA-PPP study	Official Rate (units of currency per $)
Guatemala	•83 quetzales	1•0
El Salvador	1•85 colones	2•5
Honduras	1•69 lempiras	2•0
Nicaragua	5•77 cordobas	7•0
Costa Rica	4•35 colones	(6•66)

Conversion factors of this kind are themselves misleading, given the difference in economic structures. Nonetheless the infrequency of exchange rate charges and the "openness" of the economies means that we can regard the exchange rate as approximating to the equilibrium price for foreign exchange.

(v) Population: per capita measures depend upon good, reliable, and frequent population censuses, which are of mixed quality.

(c) Social Indicators: Macro-economic data is not only unreliable but disguises facts which may be of great relevance in evaluating living standards especially when the income distribution is highly skewed

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1. United Nations: "A Measurement of Latin American Real Incomes in $U.S.", Economic Bulletin for Latin America, 1957 (October).
S. N. Braithwaite: "Real income levels in Latin America", Review of Income and Wealth, Newhaven, U.S.A., 1968 (June).

Diag. 1 in the text (Introduction and Synopsis) shows how for example the income per capita in Honduras, which is not greatly lower that that of El Salvador, understates the "backwardness" of that economy as measured by urbanisation and industrialisation. Equally the relatively high income per capita in Guatemala obscures the fact that illiteracy, school enrolment and infant mortality are the lowest in the region and possibly in all Latin America. Costa Rica's superiority in living standards (literacy, housing, infant survival,-doctors per 1,000 inhabitants, nutrition etc.) is understated by conventional economic indicators. Note also how the "growth" of El Salvador's GDP is accompanied by falling nutrition in an already underfed economy: a fact which squares with documentation of the declining living standards of the rural masses in El Salvador and Guatemala.

Wherever possible this kind of cross-check will be made.

Appendix II "Normal" Levels of Industrialisation

There have been various attempts to make quantitative generalisations about the size of the industrial sector, its changes over time and variations between countries. The relationships between the size of the industrial sector and various explanatory variables has tended to take the following form:

(i) historical studies of advanced industrial countries,[1]
(ii) X-section studies of countries at different income levels,
(iii) time series of "underdeveloped" countries.

The third is the most directly relevant from our point of view but the paucity of data makes its application difficult except for richer countries, though this approach has been used by Kusnetz.[2] X-section analysis has been used more commonly, as in the Chenery study.[3] He is primarily concerned with the relative importance of manufacturing and its sub-sectors as economic growth proceeds. The 1960 Chenery study estimates a basic linear logarithmic regression equation, in which per capita value added depends on per capita income and upon population:

$$\log Vi = \alpha + \beta \log Y + \gamma \log N;$$

where Vi is the per capita value added in industry or sector i, Y is national income per head, N is population, β is the "growth elasticity" and γ is "size elasticity". The regressions produced good correlation

(1) W. Hoffman: "The Growth of Industrial Economies" Manchester, 1958. He was concerned with analysing the shift from consumer goods to capital goods production as nations industrialise.

(3) S. Kusnetz: "Quantitative aspects of the economic growth of nations" Part II. Economic Development and Cultural Change, July, 1957. He was concerned with changes in share of labour in various sectors over time. The basic finding for his sample - which included few developing countries - is that agriculture consistently loses manpower while services, and to a lesser extent manufacturing, gain it.

(3) B. Chenery: "Patterns of industrial growth" American Economic Review, Sept. 1960.

	UN β_1	Chenery β_2	Chenery and Taylor (L) β_3	Chenery and Taylor (SM) β_4	Chenery and Taylor (SP) β_4	UN γ_1	Chenery γ_2	Chenery and Taylor (L) γ_3	Chenery and Taylor (S) γ_3	UN δ_1
20-39 Total manufacturing	1.369	1.620				1.124	.83			
20-21 Food and beverages	.978	1.129	.616	.690	1.034	.862	.001	—.165	—.208	.884
22 Tobacco		.928					.234			
23 Textiles	1.205	1.444	2.250	.549	1.08	1.329	.401	—.215	.265	.964
24 Footwear and clothing	1.361	1.687	2.788	.898	1.333	.962	.065	—.514	—.237	.877
25 Wood and cork manufactures	1.531	1.765	—1.056	.758	1.600	1.030	.080	—.748	—.302	1.008
26 Furniture and fixtures										
27 Paper and paper products	2.035	2.692	3.197	1.703	1.941	1.116	.518	—.001	—.325	1.699
28 Printing and publishing	1.718	1.703	4.524	1.461	1.440	1.041	.177	—.156	—.271	.873
29 Leather products	.893	1.642	.578	.398	1.282	.857	—.026	—.198	—.666	1.251
30 Rubber products	1.582	1.998	4.943	1.516	1.395	1.201	.438	—.261	—.040	.281
31 Chemicals	1.547	1.655	3.021	1.110	1.630	1.395	.257	—.017	.225	.712
32 Petroleum and coal products		2.223					1.040			
33 Non-metallic mineral products	1.157	1.617	5.203	1.178	1.322	1.014	.164	.152	—.058	1.116
34 Basic metal industries	1.991	2.143	6.463	.817	1.474	1.649	.419	.565	.271	1.915
35 Metal products	1.984	2.799	4.135	1.78	1.630	1.312	.315	.532	—.449	1.566
36 Machinery exc. electricity										
37 Electrical machinery										
38 Transport equipment		2.327					.256			
39 Miscellaneous manufacturing	1.847					1.333				1.053

Sources: UN, *A Study of Industrial Growth;* H. B. Chenery, "Patterns of Industrial Growth", *American Economic Review*, 1960; H. B. Chenery and L. Taylor, "Development Patterns: Among Countries and Over Time", *Review of Economics and Statistics*, November 1968.

Notes: $\beta_{1 \ldots 4}$ are income coefficients

$\gamma_{1 \ldots 3}$ are population coefficients

δ_1 is the sectoral coefficient "0" – the degree of industrialisation

L : Large country sample

SM : Small Manufacturing country sample

SP : Small Primary producer sample

S : Small country sample.

coefficients and were used for making generalisations about the "pattern of growth". The major finding was evidence of an increasing share of manufacturing in the economy as it grows (the "growth elasticity" was 1·36 for industry); but on a disaggregated level there was evidence of substantial differences in growth elasticities and "size" (or scale) elasticities between sectors (see Diag. A2-1). The study "explains" 70% of industrial growth through the regression, in terms of changes in levels of income per head, and scale effects. The main implications of the study are as follows:

(i) there is a well-defined "normal" pattern of growth,

(ii) lagging sectors, in which the industrial structure deviates from normal, are likely to grow more quickly to catch up,

(iii) economies of scale are probably highly important,

(iv) the study also recognises substantial variations as well as similarities based on particular national factors. (1)

A U.N. study used newer and fuller data than Chenery, but a similar method.(2) The study experimented with eight groups of candidate proxy variables for various explanatory factors and produced statistically significant multiple regression equations which explained the variations in the normal level and pattern of manufacturing in terms of the average experience of countries studied. A total of 53 countries were studied for 1953 and 46 for 1958; the data being pooled. The final

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(1) Ibid p.650-51; also B.B. Sutcliffe: "Industry and Development" op. cit. pp.48-49.

(2) United Nations, Department of Economic and Social Affairs: "A Study of Industrial Growth" New York, 1963.

general equation is similar to that of Chenery and the income and "population" elasticities, both for the aggregate sample and for industrial sectors, are set out in Diag. A2-1. There is an elasticity of greater than one in respect of income per capita income; a 1% increase to be associated with a 1·37% increase in industrial output per capita and a 1% increase in population to be associated with a 1·12% increase in industrial output per capita. The sectoral equations are also of importance and here a new variable "D" enters. "D" is the ratio between actual value added and the "calculated" value added in the whole manufacturing sector.(2) The sectoral equations enable us to predict changes in industrial structure as income and population rise: textiles, leather products, food, beverages and tobacco tend to decline in importance; paper and paper products, chemicals, rubber products and metal products to rise.

The sectoral equations are thus of the form:

$$\log V_o = \alpha + \beta \log Y + \gamma \log N + \delta \log d$$

where d is the "degree of industrialisation"; Y is the income per head in 1953 per capita dollars; N is the population in millions. The coefficients are significantly different from the Chenery general equations particularly in respect of 'size', but the sectoral ranking is similar and orders of magnitude are closer for the "income" coefficient.

Another important study seeking to corroborate the Chenery findings was that of Chenery and Taylor which extends the analysis to a time series over 13 years and produces coefficients similar to those found in the X-section study.(1) They also divide the sample into three categories:

(1) H.B. Chenery and L. Taylor: "Development patterns among countries and over time" Review of Economics and Statistics, November, 1968.

(2) The ratio "D" has some correspondence to the "coefficient of localisation" used in regional economics though it is measured not in employment terms, and more crude averaging is not involved in defining the "normal" level of activity

large, small industry-orientated, and small primary-orientated countries.

These different studies have been used for looking at the "normality" of the industrial growth pattern of individual countries or groups of countries. A great deal of any deviation from the normal pattern can be explained by resource endowment, e.g. one would expect a small closely packed country with limited land area to have a high "D" and a country with a strong natural resource endowment the opposite. Countries with a traditional bias to exporting agricultural products would be expected to have a low "D". The U.N. study gave considerable prominence to the role of government policy, or lack of it. Government control of the composition of demand, the structure of national product, and the pattern of trade, seems to have led to a higher level of manufacturing for given per capita incomes. It was shown that there was a considerate "above-normal" degree of industrialisation in Eastern Europe and this was a direct result of government policy. A considerable degree of government intervention in some of the "mixed" economies also appears to lead to a higher rate of industrialisation.

However, there are considerable reservations that one might have about using a study of "D"'s to tell us about significant development features of particular economies:

(a) at a logical level, it is incorrect to argue that because there is a correlation between degrees of development and industrialisation that there must be a casual connection: post hoc, ergo propter hoc. The x-section studies traced general patterns of significance and correlation. The relations are not normative, but the best fit of a

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(1) United Nations: "A Study of Industrial Growth" op. cit. p.14.

large sample, and relationships between "normal" and "actual" value-added can only be explained by a complex of political geographic and economic factors in each case. For this reason a simplistic policy of basing a more intensive industrialisation programme on findings of this kind cannot strictly be justified. "It is unfortunate that this pioneering study associates growth with industrial patterns in its title because planners are often tempted to interpret the regression equations as a blue print for a strategy of industrialisation". (1) For example, merely to increase the share of manufacturing value added could be done either at enormous or small cost in terms of opportunities foregone and use of the equations tells us nothing about the "cost" of industrialisation.

(b) The application of the results of X-section analysis to time series projection is a familiar criticism. Temin criticised in principle the logical assumption behind this extrapolation and found that empirical testing of the Chenery and U.N. coefficients over time showed only limited comparability with the X-section coefficients: "the existence of time-series patterns of the same form as X-section patterns is still more an assumption than a conclusion". (2) Steuer and Voividas also found that the X-section coefficients failed to hold-up for time series: "Quite pervasive X-section evidence of the existence of a fairly uniform pattern of industrialisation of the kind found by Chenery

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(1) W. Hong: "A study in the changes in the structure of manufacturing industry and the trade patterns of manufacturing production in Korea, Taiwan and Japan", Ph.D. (Colombia), 1966, (microfilm) p.22.

(2). P. Temin: "A time series test of patterns of industrial growth" Economic Development and Cultural Change, Jan. 1967, pp.174-81.

is consistent with a lack of temporal stability of the pattern." (1) Steuer and Voicidas also indicate that there is good reason not to expect stability over time as many fundamental conditions of the world economy - the existence of planning, the emergence of new technology, new trade relationships - act to prevent the conditions, which were present when European countries industrialised, reproducing themselves. However, other time series studies provide more sympathetic evidence based on larger samples and larger time series than the Steuer-Voividas study. (2) Chenery himself defended the idea of using the data for projection purposes and the U.N. study produced results, stable over five years, though they were guarded as to the use the projections might be put to:" the model based on the standard equations is not intended to be used as a coin-in-the-slot machine which would turn out projected output levels by mechanical computation." (3) One might summarise by saying: "on the whole the question of the applicability of X-section results to time series considerations must be approached with caution from the stand-point of individual countries." (4)

(c) The relationships in the very simplified models comprise only a limited number of the most important variable. It was found in Latin America that there was a persistent tendency to "under-industrialisation", and a separate regression analysis gave different elasticities from the larger sample. A normal equation incorporating "urbanisation" and "import coefficients" (measuring the scope for import substitution) gave a substantially better fit than the other normal equations.(5)

(1) M. Steuer & C. Voividas: "Import substitution and Chenery's patterns of industrial growth" Economia Internazionale, 1965, pp.56-65.

(2) H.B. Chenery & L. Taylor: "Development Patterns, etc." op. cit.

(3) United Nations: "A Study of Industrial Growth" op. cit. p.29.

(4) R. Stern: "Quantitative International Economies" 1970, pp.152-157.

(5) United Nations (ECLA): "The Process of Industrial Development in Latin America" op. cit. pp.51-54.

(d) All five countries are small, low income countries and as such are unrepresentative of the general sample, and incorporate any bias which is implicit in this part of the sample.

(e) Statistical deficiences are considerable (Appendix 1), especially the highly suspect estimates of manufacturing value added. In several cases this involves inclusion of coffee processing, which is only tenuously "manufacturing" in any meaningful sense: this accounts for 20% of the total in El Salvador and 10-15% in Honduras and Costa Rica. Also figures should be reduced to 1953 U.S. dollars which puts considerable strain on Central American sources of data.

Application to Central America

The defects of using the findings of the X-section studies to make inferences regarding the "normality" of a given industrial structure, especially at a sectoral level, have been set out. If these objectives are not considered overwhelming then there are still serious problems of managing the statistical material.

(i) "D" was calculated for each country separately; and for the region as a whole for 1953 to 1969. This involved computing the national income (at 1953 prices) from GDP at current prices. Where GDP was not automatically deflated a price index was used - being the average of wholesale and retail prices. National income is obtained fron the GDP figures. Industrial value added was obtained from the GDP statistics (and deflated by the same factors) and population from the U.N. Demographic Yearbook.

(ii) For a sectoral analysis "D" was used (in 1953, 1960, 1965) to calculate the relationship between "normal" and "actual" value added.

Both of these exercises, especially the second, are fraught with dificulty. Statistical deficiencies are considerable, as explained in Appendix I. The use of price indices to deflate 1953 prices is not altogether satisfactory / as price indices are unrealistic and are certainly not as precisely applicable to individual industrial sectors as they are to the aggregate figures. The original study data was also expressed in U.S. dollars and currencies elsewhere are, in varying degrees, over-valued: an ECLA study in 1960 indicated that freely floating exchange rates would be 35-15% down against the dollar from the fixed parity.(1) However, in most Central American countries, inflation has been modest; and this problem is, therefore, not serious. The Costa Rica currency was probably the most over-valued and in 1971 the colon floated down by 20% against the dollar.

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(1) See Appendix I, p.4.

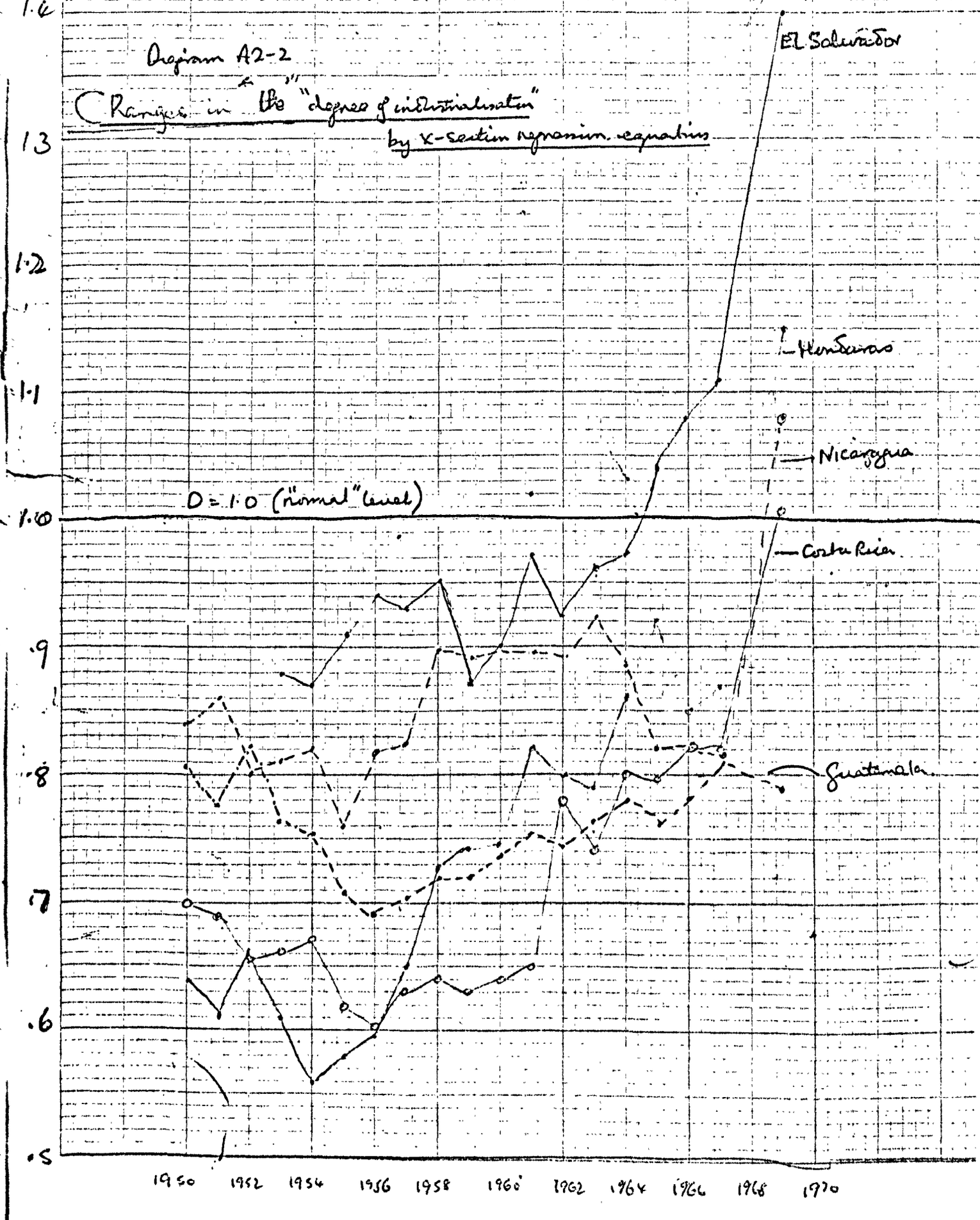
Results

1. The first result, the calculation of "D", is shown on the Graph (Diag.A2-2). Except for 1969 (in all cases except Guatemala) there has generally been "under-industrialisation" in all countries, El Salvador is an exception to this pattern as one might expect from a relatively urbanised country which has spawned an entrepreneurial class ready to develop investment openings. In all five countries there is a generally an upward trend of "D"; as import substituting industrialisation has proceded. Exceptional is Nicaragua, where growth in the 1960's has tended to come from cotton exports rather than manufacturing. Guatemala has a low "D", generally, despite Guatemala City having the status of an industrial centre. With its larger population, much of it outside the money sector, the industrial value added is less than one would expect for a country of that average income level and population.

2. On a sectoral level, there is a pronounced tendency for positive deviations to appear most strongly in the 'traditional' industries (food, tobacco, textiles, clothes and timber) and strong negative deviations elsewhere, especially in the chemicals and metal products sectors./ (statistical tables). There are some exceptions - Salvador does not have a timber products industry (no trees!) and in 1965 the construction of an oil refinery had raised its 'chemicals' and petroleum products category to an 'above normal' level. Honduras has a strong positive deviation for timber products while appearing to be deficient in other 'traditional' industries. There is a strong positive deviation for chemicals (from the big vegetable oils industry). Nicaragua has had a strong positive deviation in the clothing industry; Costa Rica also in chemicals. Considered regionally the pattern is similar; a strong positive trend in all traditional products

Diagram A2-2

Ranges in the "degree of industrialization" by x-section regression equations



(except textiles) and a negative trend in all chemical and metal based industry. Over the 1953-1965 period there was no marked shift, except towards the building up of a textile industry.

An analysis of the sum of deviations from the "normal" in absolute terms and regardless of sign, (expressed in percentage terms) is given below:

average for countries under U.S. $150	37.7
Asia	31.9
Latin America	16.4
Europe	33.9
Africa	36.0

Central America	1953	1960	1965
Region	58	51	51
Guatemala	52	42	47
Honduras	38	32	n.e
Nicaragua	49	39	30
Costa Rica	n.e	13	22
El Salvador	35	29	40

As can be seen, most of the deviations are of the same order as the average for poorer countries in the U.N. study, but there are some very large deviations (for Guatemala). The sum of deviations for the region as a whole is much more, which indicates that in regional terms Central America conforms much less closely to the 'normal' pattern of the sectoral distribution of manufacturing output then a "typical" country of 13 million people and the same average income. The deviations are due to a very large "above normal" traditional sector and below normal modern sector.

Statistical Tables for Appendix 2 (Value added = $ m.)

Guatemala (1953, 1960 and 1965).

	1953					1960					1965				
	Value Added ($m.)		%		Dev.	Value Added				Dev.	Value Added				Dev.
	Actual	Normal	A.	N.		Actual	Normal	A.	N.		Actual	Normal	A.	N.	
Food Beverage & Tobacco	56.0	35.0	60.0	46.0	14.0	73.7	50.0	55.0	40.0	15.0	82.2	66.7	42.5	38.0	4.5
Textiles	7.6	5.9	8.0	8.0	-	11.9	8.7	9.0	7.0	12.0	38.6	14.3	17.5	8.0	9.5
Shoes & Clothes	11.2	6.5	12.0	8.5	3.5	17.3	9.6	13.0	8.0	5.0	39.6	14.0	18.0	8.0	10.0
Wood & Furniture	5.9	4.4	6.1	5.8	0.3	7.3	6.2	5.5	5.0	0.5	9.4	10.4	4.3	6.0	1.7
Paper	-	1.1	-	1.5	1.5	0.6	1.7	0.4	1.3	0.9	2.6	3.3	1.2	1.8	0.6
Printing	2.2	2.9	2.5	3.0	0.5	3.4	4.2	2.5	3.4	0.9	9.0	7.2	1.6	4.1	2.5
Leather	1.9	1.5	0.2	1.9	1.7	2.3	1.9	1.8	1.5	0.3	1.6	2.8	0.7	1.6	0.9
Rubber	0.2	1.1	0.3	1.5	1.2	1.6	1.7	1.2	1.3	0.1	2.2	2.7	1.0	1.5	0.5
Chemicals & Petrol	3.0	6.5	3.4	8.5	5.1	4.7	7.6	3.6	6.1	2.5	10.0	13.5	5.0	7.7	2.7
Non-metallic Minerals	3.5	6.0	3.7	7.8	4.1	5.3	9.6	4.0	7.8	3.8	9.9	12.9	4.5	6.3	1.8
Basic Metals	-	-	-	-	-	-	1.3	-	1.1	1.1	-	2.9	-	2.6	2.6
Metal Products	1.8	7.5	2.0	9.7	7.7	1.5	11.6	1.1	9.4	8.3	8.8	22.9	4.0	13.0	9.0
Other Manufacture	-	-	-	-	-	-	1.4	-	1.1	1.1	2.8	1.8	1.3	1.5	0.2
	93.4	Σ76.5	100.0	100.0	39.6	133.0	Σ123.0	100.0	100.0	41.5	219.7	175.3	100.0	100.0	45.6

Vo = "Normal" Values added is 126.5
Arrived at directly.

Vo = 181

Vo = 276

El Salvador

	Value Added		%		Dev.	Value Added		%		Dev.	Value Added		%		Dev.
	Actual	Normal	A.	N.		Actual	Normal	A.	N.		Actual	Normal	A.	N.	
Food Beverage & Tobacco	33.0	24.6	61.0	49.2	11.8	47.0	34.3	59.0	44.5	14.5	67.1	49.1	49.0	45.5	3.5
Textiles	3.0	3.4	5.4	6.6	1.2	7.0	5.3	9.0	7.0	2.0	12.0	8.5	9.0	7.7	1.3
Shoes & Furniture	8.3	4.0	14.6	8.0	6.6	14.2	6.0	17.5	8.0	9.5	18.8	9.3	0.15	8.5	6.5
Wood & Furniture	2.7	2.6	5.0	5.3	0.3	1.7	4.1	2.1	5.5	3.4	2.7	6.7	1.6	6.0	4.4
Paper	-	-	-	-	-	0.2	1.2	0.25	1.5	1.3	1.5	2.2	1.2	2.0	0.8
Printing	0.7	1.6	1.3	3.5	2.0	2.0	2.4	2.5	3.2	0.7	2.6	4.3	2.0	4.0	2.0
Leather	1.1	1.2	2.1	2.3	0.2	1.2	1.2	1.5	1.5	-	1.0	1.9	0.9	1.7	0.8
Rubber	-	-	-	-	-	-	-	-	-	-	1.2	1.4	0.6	1.25	0.65
Chemicals & Petrol	1.4	2.5	2.5	4.9	2.4	3.0	4.1	3.75	5.5	1.75	12.3	7.0	0.1	6.5	5.5
Non-metallic Minerals	1.9	4.1	3.6	8.1	4.5	2.2	6.0	2.75	8.0	5.25	-	9.2	3.9	8.3	5.4
Basic Metals	-	-	-	-	-	-	-	-	-	-	0.4	1.7	0.6	1.6	1.0
Metal Products	1.6	4.2	3.0	8.3	5.3	4.3	7.4	5.25	10.0	4.75	5.2	14.0	5.6	12.6	7.0
Other Manufactures	-	-	-	-		-	-	-		-	-	1.3	2.4	1.2	1.2
	55.0	Σ 48.2	100.0	100.0	34.6	82.7	Σ 72.0	100.0	100.0	43.0	136.1	109.6	100.0	100.0	39.7

Vo = 59.4 Vo = 90 Vo = 136.7

Honduras (1953, 1960, 1965)

	1953					1960					1965			
	Value Added		%	%	Dev.	Value Added		%	%	Dev.	Value Added		%	%	Dev.
	Actual	Normal	A.	N.		Actual	Normal	A.	N.		Actual	Normal	A.	N.	
Food, Beverage & Tobacco	11.0	17.0	44.0	56.0	12.0	21.0	22.4	50.0	52.0	2.0		24.8			
Textiles	0.4	2.0	1.5	66.0	5.1	0.45	2.8	1.2	7.0	5.8		4.0			
Shoes & Clothes	4.7	2.6	18.0	8.7	9.3	7.2	3.5	17.4	8.2	9.2		5.2			
Wood & Furniture	3.1	1.9	12.0	6.3	5.7	2.9	2.6	7.0	6.2	0.8		3.5			
Paper	-	-	-	-	-	-	-	-	-	-		-			
Printing	0.6	-	2.0	-	2.0	1.1	1.4	2.4	3.5	1.1		2.2			
Leather	0.3	-	1.0	-	1.0	-	-	1.6	-	1.6		1.4			
Rubber	-	-	-	-	-	-	-	-	-	-		-			
Chemicals & Petrol	3.1	1.45	12.0	4.8	7.2	2.8	2.1	4.6	5.0	0.4		3.3			
Non-metallic minerals	2.0	2.6	8.0	8.6	0.6	1.8	3.9	4.2	9.2	5.0		5.1			
Basic Metals	-	-	-	-	-	-	-	-	-	-		-			
Metal Products	1.6	2.3	6.0	7.4	1.4	1.7	3.4	3.9	8.2	4.3		6.0			
Other Manufacturers	-	-	-	-	-	0.8	-	1.4	-	1.4		1.0			
	26.0	Σ 29.7	100.0	100.0	38.0	40.0	Σ 42.0	100.0	100.0	31.7		Σ 55.5			

Vo = 39.6

Vo = 56.1

	1953					1960					1965				
Nicaragua	Actual	Normal	%A	%N	Dev.	A	N	%A	%N	Dev.	A	N	%A	%N	Dev.
Food Beverage and Tobacco	13	13.3	50	62	12	23.4	18.7	54	43	1	37.7	26.2	55.8	43.4	12.4
Textiles	.9	1.35	3.5	6.3	3.1	2.6	2.2	6	6.3	.3	4.5	3.9	6.6	6.4	.2
Shoes and Clothes	6	2.0	24	8.0	14.5	9.9	3.1	22.6	8	13.6	10.8	5.5	14	9	5
Wood and Furniture	1.75	1.25	7	4.6	1	2.2	2.0	5	7.5	2.5	2.5	3.8	1.5	1.5	-
Paper	-	-	-	-	-	.5	-	1.1	-	1.1	1	1	-	-	-
Printing	.9	-	3.5	-	3.5	.9	1.3	2.1	3.4	1.3	.4	2.6	1.4	4.3	2.9
Leather	.45	-	1.7	-	1.7	.2	-	5	-	.5	1.0	1.02	1.4	1.6	.2
Rubber	-	-	-	-	-	1.5	-	3.3	-	3.3	3	-	-	-	-
Chemicals and Petrol	.9	-	3.5	-	3.5	1.4	1.7	3.1	4.8	1.7	6.4	3.5	5.75	5.8	.05
Non metallic minerals	.9	1.95	3.5	9	5.5	-	2.9	-	8	8	3.0	4.7	3.5	8	5.5
Basic metals	-	-	-	-	-	.6	-	1.5	-	1.5	-	-	-	-	-
Metal products	.8	1.55	3.2	7.5	4.3	.2	2.8	.5	8	7.5	2.4	6.3	6.0	1	5
Other manufactures	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.5
	26	22.3	100	100	49	43.3	35.4	100	100	42.5	68.9	58.5	100	100	34.6
		Vo = 28.7					Vo = 50.0					Vo = 92.3			
Costa Rica															
Food Beverage etc.	14	15.3	47.5	54	6.5	24	23.1	50	47	3	32	32.1	42	44	.2
Textiles	.7	1.5	2.3	5.3	3	2.4	2.7	5	6	1	4.8	4.3	6.0	5.7	.3
Shoes and Clothes	3.75	2.65	12.5	9.4	3.1	4.8	4.45	10	9.25	.75	4.9	6.6	8.6	8.8	.2
Wood and Furniture	5.5	1.75	18.3	6.2	12.1	4.2	3.1	8.8	6.5	2.3	8.3	4.7	10.4	6.3	4.1
Paper	.1	-	.25	-	.25	.15	-	-	.3	.3	1.0	1.5	1.2	2.0	.8
Printing	.75	1	2.5	3.5	1.0	1.9	1.95	4.0	4.2	.2	2.4	3.3	3.1	4.4	1.3
Leather	.7	-	2.3	-	2.3	.95	-	2	-	2	.9	1.35	1.1	1.8	.7
Rubber	.2	-	.6	-	.6	.33	-	.65	-	.65	.6	1	.8	1.3	.5
Chemicals and Petrol	1	1.25	3.5	4.4	.9	2.75	2.42	5.6	4.9	1.7	8	4.1	9.9	5.3	4.4
Non metallic minerals	.6	2.3	2.0	8.2	6.2	1.55	3.7	3.2	3.3	.1	3.4	5.5	4.5	7.3	2.8
Basic metals	-	-	-	-	-	-	-	-	-	-	.6	-	.8	-	.8
Metal Products	1.95	2.35	5.8	8.6	2.8	3.35	4.9	6.8	10.3	3.5	7.2	8.5	8.9	11.3	2.4
Other manufactures	.3	-	1.0	-	-	-	-	-	-	.9	1.6	-	2.0	-	2.0
	30	27.9	100	100	38.8	47.5	47.5	100	100	14	80.3	.76	100	100	22.3
		Vo = 39					Vo = 68.7					Vo = 103.8			

Appendix II(b) The effects of economic integration.

Ch. 1 dealt with (on p. 49) the potential usefulness of the x-section data in calculating the effect of economic integration by illustrating the rule of economies of scale. The Elkan and Stoutjesdjk studies have already been described.

"D" was calculated for various years for the region as a whole and the "normal" value added contrasted with the sum of "normal" value added for the countries separately. In 1953 the regional "normal" was 40% greater than the sum of the fragmented parts: in 1960 and 1965 the factor was 50%. The potential gains from integration are thus very large if seen in terms the relative importance of manufacturing output. As a proportion of GDP this would indicate a gain of 5% in 1965, (exclusive of secondary effects resulting from the expansion of manufacturing).

There are however certain points of qualification in addition to the general doubts about the applicability of the x-section regressions expressed earlier;

(i) the sum of "normal" sectoral value added does not necessarily equal the overall "normal" value added for any one country: "the linear form of the logarithmic equations precluded consistent compliance with the additivity condition: that is, the condition that the sum of predictive values from the thirteen sectors in a given country should equal the value added of the total manufacturing in the same country. This, however, does not materially effect the practical usefulness of the equations."(1) Direct comparisons are made, therefore, by percentaging.

(1) United Nations: "A Study of industrial growth" op. cit. p.6.

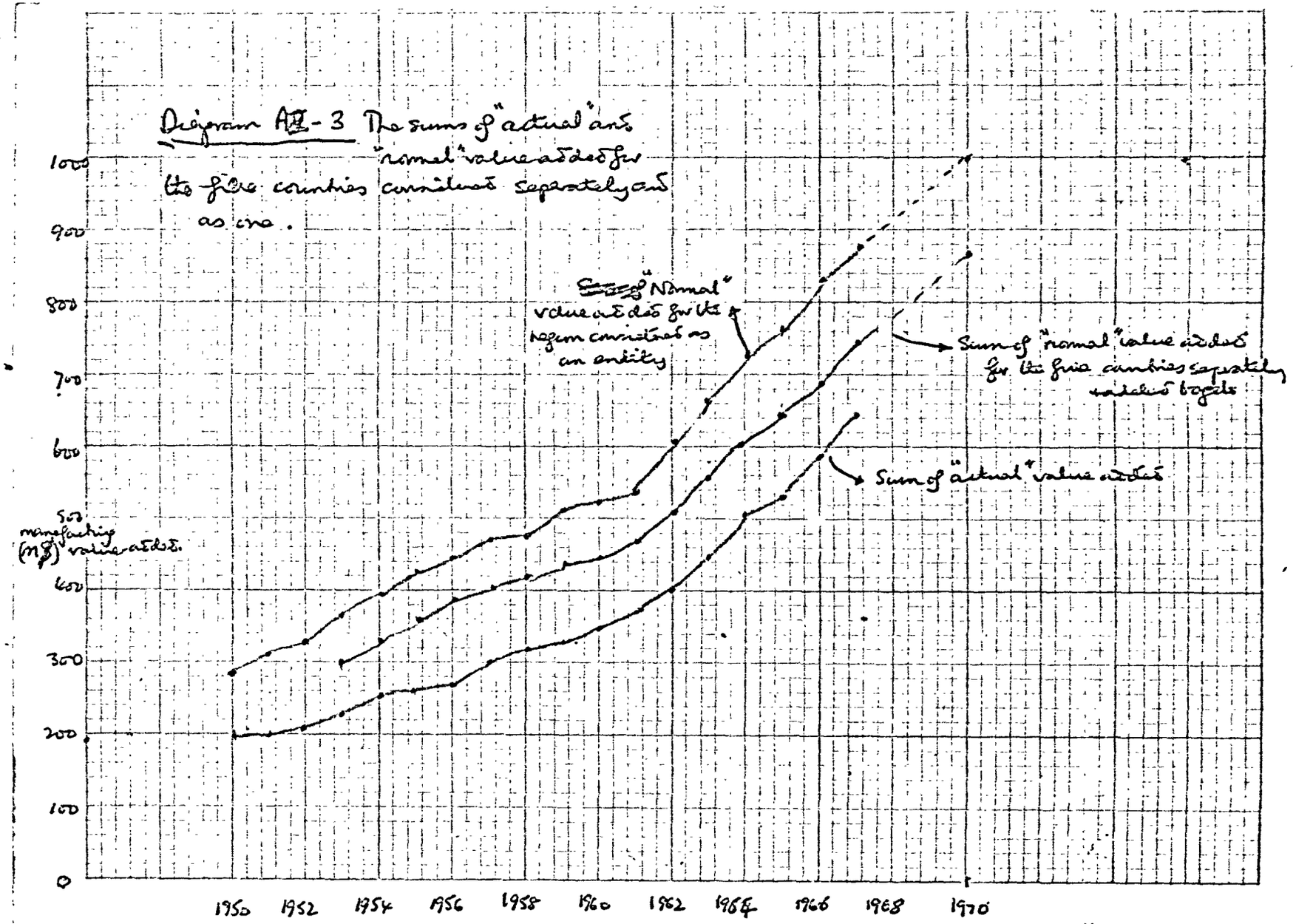


Diagram A2-3 The sums of "actual" and "normal" value added for the five countries considered separately and as one.
1000
900
800
700
600
500
400
300
200
100
0
manufacturing (MVA) value added.
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
"Normal" value added for the region considered as an entity
Sum of "normal" value added for the five countries separately added together
Sum of "actual" value added

(ii) as Sakomoto explains, the sectoral implication of integration depend upon the value assumed for "D" after integration. (1) "D" will presumably increase in value as the region begins to realise some of the dynamic benefits of integration in the long term. The effect on different sectors will depend on whether the regional "degree of industrialisation" is assumed to be the weighted average of national "D" pre-integration, or greater or less. However, in relative terms the sectors which show the greatest gain from integration are chemicals, rubber products, basic metals diverse manufactures, pulp and paper and textiles.

(iii) It is unreasonable to assume that a common market arrangement is equivalent to the partner states becoming one homogeneous state from the point of view of industrial investment. In practice, imperfect integration, uncertainty, suspicion and transport costs, partially negate the effect of the larger market.

(iv) population size is a poor proxy for "size". (2) Two thirds of the population in Central America is rural, much of it outside the money economy altogether. The fact that much of a market may be scattered rather than compact has led to the notion of "purchasing power density" as a better measure of market size. (3) Inclusion of income per capita in the regression equations means that inter-national differences are taken into account as far as that is concerned.

Just as it can be shown that a larger market will tend to create more favourable conditions for manufacturing industry, so the Chenery analysis showed a significant correlation between "size" and the overall import ratio. A "bigger" unit therefore would expect to have a smaller "trade-gap" problem.

(1) W. Sakamoto: "Industrial Development & Integration of Underdeveloped Countries" Journal of Common Market Studies, 1968/69, pp.243.

(2) This problem is discussed at some length in W.G. Demas: "The Economics of Development of Small Countries with Special Reference to the Caribbean" McGill University 1965.

P.T.O.

Appendix III Income Distribution or Regional Integration?

One of the main attacks on this thesis which could be made is by those who argue that regionally based industrialisation is "irrelevant" to the "real" problems which are the enormous disparities of income and wealth. This argument normally has two forms and the first would be accepted by the author. This is to the effect that fundamental land reform and income distribution is an overwhelming need, and is justified not only in equity terms but for efficiency reasons: it could in the long run stimulate agricultural output on underutilised lands; it could stimulate demand for labour-intensive basic manufactures like clothes and footwear rather than luxury products; and because of the high rate of consumption of the elite groups there would not necessarily be an adverse effect on savings and investment. (1) The latter part of the appendix will be devoted to showing the scale of inequality and how major structural reform could assist economic growth rather than retard it. Noting this, "the advantages of economic integration should not blind us to the need for redistributive social change", (2) and it must be said that development economists, and indeed economic analysis generally, says far too little on the question of distribution.

However, there is a more forceful version of the argument which states that Latin American regional integration is a hindrance to a fundamental structural transformation of society. The fact that "the lack of commitment by the O.A.S. countries with respect to wealth distribution contrasts sharply with the official enthusiasm .... for the development of regional integration

(1) Inter alia: K. Griffin: "Underdevelopment in Spanish America" Allen & Unwin 1968, Chapter 1.

(2) M. Edel: "Regional integration and income redistribution: complements or substitutes?" R. Hilton (ed): "The Movement Towards Latin American Unity", op. cit., Chapter 15.

systems" is explained by the fact that "regionalism offers a way out of the .... political dilemmas associated with the process of creating sufficient new demand among the impoverished masses ...".(1) Aside from the distraction of reforming energy it is argued that a regional grouping (in the absence of counter measures) will lead to a polarisation of income and wealth spatially within the region and among districts of a country, and probably also in class terms as a business class and unionised workers appropriate a large share at the expense of peasants and the urban unemployed.(2) However, the main beneficiary, it is argued, is "American imperialism".

Most Marxist and nationalist writers on Central America have argued that "in practice this (i.e. integration) has meant the expansion of local markets in favour of foreign interests especially of the United States. That is, from this moment on, the imperialist deck was stacked with the sentimental trump card of "Central Americanism"." (3) Galeano, writing on Guatemala states, "Central American integration as now being carried out, produces nothing but disintegration of the area's weak national industries for the benefit of the integration of foreign companies. With markets widened and tariffs and controls eliminated, imperialist plunder takes on new and more effective forms". (4)

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(1) O. Solar: "The case against Latin American integration: economic and political factors" chapter 9 in R. Hilton (ed), ibid. Solar develops this argument by stating that "continental nationalism" under the aegis of U.S. power, will enhance the ability of existing governments to resist forces bent on redistributing rural wealth and restruct[illegible] agrarian society in favouring the unrepresented masses". (p.128).

(2) The effect on the employment situation is derived from the replacement of labour intensive production methods by capital intensive methods.

(3) Alfonso Paiz: "The Third Government of the Revolution and Imperialism in Guatemala". Science and Society, Summer 1970, p. 152.

(4) E. Galeano: "Guatemala: Occupied Country", Monthly Review Press 1967.

Perhaps the most influential writer in this vein is Gundar Frank: he believes (inter alia) that Latin America has no need to pass through a phase of capitalist industrialisation, that it has always been in a "capitalist" rather than a fuedal state, and that economic integration merely strengthens the power of economic interests in the metropolitan "centre": "The bulk of intra Latin American trade .... is by U.S. corporations which can thus manufacture in one Latin American country for export to another .... This integrationist development augments the economic and political disequilibrium both within these Latin American countries and among them ...". (1)

The author would reject most of this formulation of the case against integration. It is important to separate out the motives of the supporters of integration from the consequences. The fact that the scheme is being supported in certain respects by some chambers of commerce and the representatives of reactionary governments should not obsure the fact that regional integration is having the effect of weakening the political power of the landlords and their backers who are the main obstacle to change in the countryside. (2) In fact the new urban classes have a strong interest in stimulating agricultural demand for manufactures and increasing food output.

Equally, the fact that the American government has blessed the agreement and many American companies profit from it should not obscure the fact that one of the main pressure groups towards integration has been the "technico" group of bureaucrats whose training was largely in the U.N. rather than C.I.A.(3) that the C.A.C.M. has substantially reduced the region's share of trade with the U.S.; that the U.S. government very strongly disapproved the dirigiste features of the Common Market;(4) and that the Andean grouping has shown

(1) Gundar Frank: "Capitalism and Underdevelopment in Latin America", Penguin 1971, p.331.

(2) J. Cochrane: "The Politics of Regional Integration: the Central American Case" Studies in Political Science: The Hague 1969, pp.98-99.
A. Inotai: "The Central American Common Market" Centre for Afro-Asian Research; Budapest 1970, p.62.
C. Mitchell: "The Role of technocrats in Latin American integration" Inter-American Affairs, Sept. 1967.

(3) For the role of "technicos" see A. Segal: "The integration of Developing Countries: some thoughts on East Africa and Central America", Journal of Common Market Studies, March 1967, pp.252-282. Segal also argues however that one of the main drives behind the integration effort of the "technicos" was a desire to sidestep the intractable political problems presented by the ruling sites and to achieve some progress in other directions.

(4) R. Denhom: "The role of the U.S. as an external sector in the integration of Latin America" Journal of Common Market Studies 1968-69, pp.199-217.
J.D. Cochrane: "U.S. attitudes towards Central American integration", Inter American Economic Affairs, Autumn 1964, pp.73-91.

how an integration agreement can be used as a highly effective means of countering the bargaining power of U.S. multinationals to a greater extent than is possible nationally. (1)

There seems some evidence to suggest that by facilitating industrialisation "a real union will make it possible to rescue the masses from their desparate poverty and this cannot happen until communications are improved, the middle classes strengthened and the old feudalists overthrown". (2) Another valuable contribution is, in the long run, to break down the obsessive competitive nationalism of the countries in Central America which is a justification in part for their large armies, which represents a weakening of their economic bargaining power, and is a useful outlet for mass emotions - as the recent Honduran/Salvadorian war indicated only too clearly. (3)

Economic integration, then, may be a useful element in the economic development of Central America, if properly managed to offset disequilibrating tendencies, and while it is not a substitute for more deep-seated reforms through taxation and land transfer, it may be a complement: "political life is a function of economic variables and .... only by transforming the economic structure in Central America will it be possible to alter existing political systems". (4) And it is not plausible to assert

(1) See Ch. 2.

(2) M. Niedergang: "The Twenty Latin Americas", Penguin 1971, p.289.

(3) It could no doubt be argued to the contrary that the failure of "integration" to achieve 'balanced' development focused attention on a potentially divisive issue more acutely.

(4) Quote in K. Griffin: "Underdevelopment in Spanish America", op. cit, p.71 from Gundar Frank: "Capitalism and Underdevelopment in Latin America", op. cit. chapter 2. To be contrasted with Kwame Nkrumah's exhortation: "seek ye first the political kingdom".

that redistribution is an "alternative" approach without suggesting how it will be implemented when the existing political system has successfully resisted attempted change for so long.

In subsequent sections we shall look at the evidence for economic equality and the two-way causal relationships; first, the likely impact of redistribution on economic structure, and second the impact of economic integration on changing economic structure and thence on income distribution.

Central America has "by and large a semi-feudal social structure pervaded by inequality. Costa Rica is an exception but only in degree". (1)

The key source of the great inequality of bargaining power is unquestionably the expansion of land ownership on the part of the few, and the absence of, or severe limitation, on the part of the many. There is a skewed distribution in all the five countries. In Guatemala 21 per cent of the farms occupy 69 per cent of the area, and 81 per cent of the farms (all under 5 acres) have 10·5 per cent of the land, and this is the most dramatically unequal distribution. In El Salvador the top 2 per cent have 57 per cent of the area, and 85 per cent of farms (under 5 acres) have 15 per cent of the land.

In Costa Rica there is a large number of "minifundios" (farms under 5 acres represent 50 per cent of the total and have 4·6 per cent of the land) and 3 per cent of farms use 51 per cent of the land, (though medium sized farms are well represented). If it is possible to identify the least inegalitarian state in land ownership it is Nicaragua - there is still a heavy concentration of ownership

(1) J. Cochrane: "The Politics of Regional Integration" op. cit. p.297.

in a few hands (4·2 per cent have 52·6 per cent of the land) but there are many more medium-sized farms than in the other countries: one suspects that this is a result of ecology and geography rather than policy.

However, statistical distributions do not tell us the full implications of unequal ownership. Some families control many farms: others own no land. Land varies greatly in fertility and were the large farms to comprise infertile land fit only for cattle ranging or forest then the skewed distribution would not necessarily indicate unequal income flows from the land: but the opposite could happen (and does); that the large farms are the most fertile. It is necessary to see also the extent to which unequal land ownership leads to unequal access to credit and government services.

Looking at the situation in individual countries, the Guatemalan problem is the only one to be well documented: "the distribution of land in Guatemala is highly skewed .... amongst those active in agriculture one found that 1·2 per cent of the families monopolise 72·2 per cent of the land. Moreover, the average quality of land in large holdings is undoubtedly superior to the quality of land in minifundia and microfundia holdings. The latifundia control all of the fertile land along the Pacific coast plus the best coffee lands". (1) The "microfarms" have on average less than one Manzana (1·7 acres) and "minifundias" are farms up to 7 acres, which is regarded as a necessary unit to sustain an average family. (2) In the 1950 census "minifundia" occupied 14·3 per cent of the land area and constituted 88·4 per cent of the total farms. The existence of a 1964 census enables comparisons to be made. (3) There is some reduction in the concentration ratios (minifundias have 19 per cent of the land area and 87 per cent of

(1) K. Griffin: "Reform and diversification in a coffee economy: the case of Guatemala" in "Unfashionable Economics - Essays in honour of Lord Balogh". (Ed.) Paul Streeten, Weidenfeld & Nicholson 1970, p.85.

(2) Comite Inter-americano de Desarrollo Agricola: "Tenencia de la Tierra y Desarrollo Socio-Economico del sector Agricola", Guatemala - another Vietnam?", Penguin 1971, especially the Appendix, pp.305-310.

(3) "Segundo Censo Agropecaurio, 1964: Direccion General de Estadistics.

the number) but there were nevertheless 20 per cent more in the small farm category. In the central region "the average size of small farms declined by almost 50 per cent as result of continued subdivision (1) and since 1950 (to 1964) the problem has been aggravated by the increase of at least 140,000 more families with insufficient or no land". (2) A 3·5 per cent birth rate adds irresistable pressure to this growth of subdivision of land.

The data which is available on El Salvador enabled a comparative study to assert that, superimposed on the already serious problem of unequal distribution, "the concentration of the land increased from 1950 to 1961 for the whole, and for each one of the zones of the country". (3) Over this period too farm owners dropped from 108,000 to 88,000 while the number of tenants rose from 33,000 to 87,000. Honduran statistics corroborates this and indicate that: "landowners have been reserving and consolidating the best lands for themselves, usually those located in the plains of the valleys, while they permitted the small farmers to settle on the marginal lands, generally in the roughest and sloping areas". (4) The same Pan American union reports helped to end some of the complacency which has enveloped Costa Rica and refers to "extreme inequality of land tenure, at once the cause and the result of the wide divergencies between the social strata that comprise the rural population". Not only is land unequally distributed but "there are known to be about 15,000 squatters or occupants without title". (5) In all the five countries the reports criticise the lack of attention paid to the problem in the Development Plans.

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(1) L. Fletcher, E. Graber, W. Merill and E. Thorbecks: "Guatemala's Economic Development: the Role of Arriculture", op. cit., p.60-65.

(2) Pan American Union: "Evaluation of Guatemala's Development Plan 1965-69", pp.160-161.

(3) Pan American Union: "Evaluation of El Salvador's Development Plan 1965-69", pp.67-68.

(4) Pan American Union: "Evaluation of Honduras's Development Plan 1965-69", p.47.

(5) Pan American Union: "Evaluation of Costa Rica's Development Plan 1965-69". P. 163.

The pattern of land ownership is one of the main determinants of inequalities of income and economic opportunity. This is because minifundia do not provide any more than subsistence living to the average family : it is estimated that 5·5 acres are needed (in Guatemala) for a family (of five) for corn, and in addition more is needed for clothes, roofing and medical needs. "Annual per capita income in the subsistence sector is probably less than $100". (1) The implication of this for the economic structure of agriculture can be seen from the diagram below; (2) referring to Guatemala.

	1950		1962	
	% of population	% of G.D.P.	% of population	% of G.D.P.
1. Subsistence economy	71·3	24·0	72·7	21·9
2. Commercial economy	28·7	76·0	27·3	78·1
(a) low incomes	21·1	24·2	20·0	20·9
(b) high/medium incomes	7·6	51·8	7·3	57·2

The subsistence sector is seen to include a large and increasing section of the population. It can be shown that per capita G.D.P. in the subsistence sector, for about 75 per cent of the population, declined from $97 in 1951 to $51 in 1966. (3) This inevitably means that the income and consumption of the poorest members of society has been falling. "Few serious observers would disagree. This has increased the pressure to migrate for seasonal work to the plantations and this in turn has increased the bargaining power of landlords. 160,000 to 200,000 persons annually migrate to the coasts where there has been wage cutting of very low rates." (4) The existence of a pool of surplus labour prevents increased money wages in the monetised sector from

(1) R. Hansen: "Central America: Regional Integration and Economic Development", op. cit., p.69.

(2) Diagram from L. Fletcher, E. Graber, W. Merrill, E. Thorbecke, op. cit.p.23.

(3) The general downward tendency and the overall figures were corroborated by several sources (the Guatemalan Social Security Institute; the Nutrional Institute

offsetting the income-depressive effect of subsistence agriculture. Gross average family incomes are probably not a great deal higher than the $50 per capita suggested above.(1) At the other end of the scale, landowners are able to maximise the return from their land through their control of agricultural credit. (2)

Surveys on income distribution have been carried out in El Salvador and indicate that 75 percent of rural families are receiving weekly incomes of under 15 colones ($6) which was the figure for "the minimum weekly consumption expenses of a typical rural family", (3) and the income of the rural population as a whole amounted to a figure "slightly higher than half" that of the economy as a whole. The subsistence nature of agriculture is such that "production for the internal market is mainly carried out by an immense number of rural farmers who have no access to adequate credit mechanism, lack sufficient technical know-how, traditionally are in want of attention from the official spheres and are forced to restrict themselves to low productivity activities". (4) El Salvador probably had the worst inequality - 8 % of the families received over 50% of the national income in the 1950's, (5) but the others are not far behind. In Nicaragua the top 1% received 25% of the national income in 1953 and more today .... and "very little tax falls on the top 1% .... while the remaining 99% after tax, have incomes perceptibly lower than $100." (6)

Corroborative evidence of income inequality from a comparative point of view is provided by a U.N. comparative study of eight Latin American and five industrialised economies; (7) two Central American countries appear in the first sample (El Salvador and Costa Rica). In terms of the percentage of

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(1) This is borne out by the work of L. Schmidt and Manual Gollas at Wisconsin in 1964-67, on migratory labour in Guatemala (unpublished seminar paper at Glasgow). They found that the average annual non-migrant income was about $43 per capita and $60 for migrants - though there were serious estimation problems.

(2) K. Griffin: "Reform and Diversification etc.", op. cit., p.85.

(3) Pan American Union "Evaluation of Development Plan of El Salvador 1965-69", p.72.

(4) Ibid., p.6.

(5) J. Pincus: "The Central American Common Market" op. cit. p.16.

(6) I.B.R.D.: "Economic Development in Nicaragua". John Hopkins 1953, p.75.

(7) United Nations Economic Survey of Latin America 1969: "Income distribution in Latin America", pp.364-417.

income earned by the top 5 per cent income earners, Costa Rica had the second most skewed distribution of the sample (35 per cent went to this category) and El Salvador the fourth (33 per cent). Brazil had the worst (40 per cent) and the U.S.A./U.K. were both about 20 per cent. This top 5 per cent group had average incomes of about seven times the national average as against a factor of four in the U.S.A./U.K. This is caused by the co-existence of a modern and industrial sector and a primitive sector, the latter based on subsistence agriculture; a great concentration of property ownership; and the existence of internationally established professional salaries and fees. The distinctive feature of El Salvador (and Costa Rica) is that there is an almost total absence of 'middle income' groups differentiated from those at very low levels; therefore, "the inequality in the lower half of the distribution in these two countries is much less than elsewhere".(1) Time series data indicates that over time (as elsewhere) there is a growth of a middle income group and a relative decline in the importance of the very rich and very poor.

Evidence can also be obtained of differences in income seen from the point of view of the difference between wage/salary payments on the one hand and payments on profits and rent on the other; though functional distinctions are difficult to make when some people are partly self-employed and partly wage-earners. In Britain 75 per cent of the net National Income consists of wages and salaries and in Central America this figure is as low as 50 per cent reflecting both the importance of profits and rents, and also of self-employed business. (2)

(1) ibid., p.393.

(2) U.N. National Accounts Statistics (1968)
1968 - percentage of National Income as

	(a) wage and salary	(b) self employment	(c) property income
Guatemala	50%	50%	
Honduras	50·7	32·4	10·2
Costa Rica	52·7	34·6	10·8

Inequality extends beyond the directly economic indices of income and wealth to embrace literacy and education and access to law, health and social services. The role of government is crucial here because of its power to slant taxation and public expenditure in a redistributive manner. However, in all Central American countries government expenditure has been very small compared with private consumption; taxation has tended to be regressive and public expenditure has only belatedly and coincidentally been allocated to the educational, housing and health needs of the mass of people. Consequently, the activities of government do little to help and may hinder.

The Pan American Union team commented that "high rates of growth during recent years .... have not resulted in a paralleled improvement of social levels". (1) The diagram below gives some indices which demonstrate this:

Diagram showing Social Statistics in Central America (early 1960's)

	Coefficient of illiteracy (10 years and over)	Percentage of relevant school age in primary school (1965)	Hospital beds for 1,000 inhabitants 1960 - 1966		Percentage population serviced by waterworks (1965)	Estimated "housing deficit" urban/rural (1965)
Guatemala	71·9 (1962)	34	2·4	2·0	26	780,000
El Salvador	52·0 (1961)	49	2·0	2·2	37	431,000
Honduras	53·1 (1961)	40	1·8	1·6	27	263,000
Nicaragua	49·5 (1963)	41	1·9	1·9	16	106,000
Costa Rica	15·0 (1963)	67	4·4	4·0	62	87,000
Central America	50 per cent		2·3	2·1	28	1,670,000

Source: Joint Planning Mission from 1965-69.

Notes: "Housing deficiency" refers to dwellings with "inadequate" services and overcrowding. There is some double counting as between these two categories and the definition is unsatisfactorily vague.

(1) Pan American Union: "Report on the Central American Development Plans 1965-69", op. cit., p.157.

On almost every basis of comparison Guatemalan's position is the most defective and Costa Rica the most satisfactory. Of the Guatemalan situation the O.A.S./Pan American Union Study describes the illiteracy situation as "one of the highest in Latin America", (1) and it is deteriorating.(2) The housing situation is described as "alarming". Health and water services are amongst the lowest in the hemisphere. The 1965/69 Plan is severely criticised for programme in "doing nothing to attack the problem of poverty of the 95 per cent of the population that lives on the land".(3) The problem is serious also in the other countries and El Salvador has been seriously criticised for allowing the social sectors to remain backward in comparison with economic infrastructure activities. (4) Nicaragua has special deficiency in the health sector (5) and "the entire rural population does not have even the most elemental means of collecting sewage or of eliminating excretions." (6)

Nor is the problem solely one of limited social spending. Central American governments have invested a pitifully small proportion of public expenditure and investment in irrigation, technical assistance, credit storage and rural feeder roads, thereby limiting the scope for improvement in real incomes. As an example of this, the estimated number of farmers reached by extension workers is 15 per cent in Costa Rica, 5 per cent in Guatemala (very much lower if Indians are included), 4 per cent in El Salvador and Honduras, 1 per cent in Nicaragua.(7)

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(1) Pan American Union "Evaluation of Development Plans" (op. cit.). (Guatemala) p.46.

(2) K. Griffin: "Reform and diversification etc." op. cit.; p.88.

(3) Pan American Union "Reports etc.", op. cit. (Guatemala) p.175.

(4) Pan American Union "Reports etc.", op. cit., (El Salvador) p.75.

(5) Pan American Union "Reports etc.", op. cit., (Nicaragua) p.289.

(6) ibid., p.289.

(7) R. Hansen, op. cit., p.73.

The problem is made worse by a regressive tax system based almost entirely on indirect taxation falling as heavily on necessities as luxuries. Despite the effort of the O.A.S. mission to suggest tax reform the governments (excepting perhaps Costa Rica) have firmly resisted a more "progressive" structure. (1)

Any attempt by low income workers to improve their real incomes is obviated by endemic rural unemployment.

What are the implications for economic development of an unequal income and wealth distribution? The two main implications are that first the skewed distribution of land leads to a "dual economy" in agriculture, to low utilisation of the large farms and over-utilisation of small farms leading to low productivity and inadequate production. Secondly, the skewed distribution of income leads to a fragmented and highly differentiated market for consumer goods. Of the first feature, Hansen remarks: "on the large farms there exists a great deal of unused land of good quality. In contrast the small holdings generally consist of the least desirable lands". (2) Honduras and Guatemala are particularly bad in this respect. On the utilised part of the good "latifunda" estates productivity is high because they have modern and mechanised techniques, and so a dual economy develops based on different techniques of production and factor combinations; profitable to the large farmer but inefficient over all. (3)

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(1) Pan American Union "Reports etc.", op. cit., Guatemala p.88; El Salvador p.138; Nicaragua p.121.

(2) R. Hansen, op. cit., p.11.

(3) K. Griffin: "Underdevelopment in Spanish America" op. cit., pp.79-80.

On the minifundia "the technology of the typical (Honduras) farm is as primitive as can be comprehended within the meaning of the term agriculture. The same can be said of the method of replenishing the soil: no more primitive method exists than that which is being used .... the land is simply cropped (there is no fertiliser applied) until yields have been reduced beyond the point of tolerance and then left fallow .... until the farmer is driven back by the exhaustion of nearby plots. With each round, however, there is a net loss both through use and through the resulting of unchecked erosion" .... "five out of six of the small farms do not even have a modern plough".(1) The low productivity of traditional agriculture and the land tenure system are inextricably related: nevertheless any attempt to distribute land without attending to the question of new inputs and improved farming practices would probably be unsuccessful.

The implications of this inefficiency for economic development is the poor performance in food production, which has resulted in food imports in growing volumes, low nutrional standards, and the pressure from under-employed labour to migrate to the cities with all the problems which that brings in its train. Even in as much as the surplus labour can be absorbed in a complementary activity to subsistence agriculture such as seasonal employment on plantations, there is a good indication that "a large pool of temporary workers willing to work for low wages discourages efficiency in export crop production and maintains marginal coffee farms in production". (2)

Perhaps the most important development implication is that a large proportion of the population make little or no contribution to

(1) V. Checchi and Associates: "Honduras: a Problem in Economic Development" 1959, p.53.

(2) K. Griffin: "Reform and diversification etc.", op. cit., p.89.

the Central American market, not only as sellers but as buyers. The implications of this for the pattern of demand is to slant demand towards consumer durables rather than "traditional" manufactures. It therefore affects the structure of industry, and in such a way as to divert demand away from the more labour intensive and net import-saving activities and to prevent these industries (and their intermediate supplier industries) from generating economies of scale from standardisation and mass production. Substantial redistribution of income would change the pattern of spending. One study has estimated that a 150 per cent rise in income in the low income group would result in expenditure increases of 400 per cent in textiles and footwear (1) and E.C.L.A. have also produced estimates showing how minor changes in the structure of demand can have major implications for the pattern of demand. (2) Diagram A3-1 show the extent to which income elasticities

are much lower on most estimates for textiles, clothing and food, than for consumer durables. One should however, be careful not to ascribe too much to the argument that a switch in demand would be employment generating in toto. Much upper-class consumption is in the form of services and much of that, very labour intensive (domestic services). The E.C.L.A. study indicated that only 20 per cent of high income consumption is in the form of consumer durables.

It has been argued that income redistribution would not only have a structural effect, but an inflationary effect because the marginal propensity to save is less in low income groups. However, high income groups also spend a large proportion of their incremental income because of the international "demonstration effect", and it is doubtful if there would be a net inflationary effect. There would be problems however also in as much as increased

(1) Inter-American Development Bank, "Agricultural Development in Latin America: the Next Decade", Washington 1967, p.107.

(2) United Nations (E.C.L.A.) "The Process of Industrial Development in Latin America", op. cit., pp.126-127.

demand took the form of pressure on inelastic supplies in agriculture.

Diagram A3-2 shows the importance of consumption of food in total expenditure (about 50%). The figure is much higher for low income groups than high income groups. Income distribution would therefore increase the demand for food markedly. Whatever ones position on the present inefficient state of agriculture, one would require to be more than realistically optimistic about the effects of land reform to believe other than that severe transitional problems (and possibly worse) will be created; in the form of rising food prices and imports.

The arguments for more active policies of income distribution have been considered. Is there any incompatibility between this goal and that of regional integration? There is no technical incompatibility: for this reason countries of widely differing political objectives have been able to establish the Andean group. The question is not the undesirability of regional integration per se, but whether or not parallel measures are taken to prevent the spatial polarisation of gains which as Odell and many others have indicated tends to be a concomitant of industrialisation in Latin America, (1) and amongst social classes. This polarisation would be no less severe under "national" industrialisation, and might be worse in so much as high protection would have to be borne by the consumers. U.S. multinationals benefit greatly, as they do also (arguably with much less 'spillover' benefit) in the traditional agricultural economy. Some effort is made in Ch. 3 and 4 to evaluate these tendencies and how mechanisms might be devised to control them without making unrealistic political demands.

(1) P. Odell: "Economic Integration and Spatial Patterns of Economic Development in Latin America", Journal of Common Market Studies 1968, p.251.
J.S. Williamson: "Regional Inequality and the Process of National Development, Economic Development and Cultural Change, July 1968.

The author attaches no credence to the view that regional integration has the effect of diffusing the reforming energy of Latin American radicals for reasons set out earlier. Indeed one of the main motivations behind integration has been the desire to reduce external dependence and international inequality by development of intermediate and capital goods industries. While it is obvious that all eggs should not be placed in the integration basket, there is no fundamentalreason why some of them should not be. The history of radical reform <u>within</u> national boundaries in Central America is not an inspiring one; one (failed) revolution in Guatemala and desultory "land reform" or colonisation projects by all give governments which had virtually no cumulative achievements. (1)

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(1) As a footnote to recent developments, it has been argued that the emergence of ultra-rightist, ultra-conservative military "gorilla" governments (all except Costa Rica) is due to the effect of regional integration in stirring up aspirations, widening regions and provoking a counter-revolutionary 'backlash'. M. Wionczek, book review, <u>Journal of Common Market Studies</u> 1968-9, p.357.

Diagram A3-1 Estimates of Income Elasticities of Demand for Major Groups of Manufactured Goods, based on Multi-national Data

Key
Column
(1) Single year between countries
(2) Single year within countries ("cross section")
(3) Time series
(4) Growth coefficients of production

	(1)	(2)	(3)	(4)
Food and beverages (including alcoholic drink)	0·5	0·6	0·8	1·129
Tobacco	0·9	-	-	0·928
Metals	-	-	1·2	2·143
Machinery and transport equipment (excluding passenger cars)	-	-	1·5-2·0	(2·799[1]) (2·327[2])
Chemicals	-	-	2·1	1·655
Durable consumer goods	2·1	-	2·7	-
Textiles	0·5	-	0·8	1·444
Clothing	(0·8) (0·9)	1·2	(0·7) (0·8)	1·687
Other manufactures	-	1·6	-	-
All manufactures				(1·441[3]) (1·620[4])
All manufactures excluding food, beverages and tobacco	1·3	-	1·4-2·0	-

Notes
1. Machinery
2. Transport equipment
3. Sample excludes India, Ceylon and Pakistan, for which census covers only establishments having 20 or more employees.
4. Sample includes India, Ceylon and Pakistan.

Sources: A. Maizels; Industrial Growth and World Trade, Table 2·1; p.42; H.B. Chenery, "Patterns of Industrial Growth" American Economic Review, 1960, Table 2, p.633.
(Diagram from R. Sutcliffe, "Industry and Development" op. cit., p.246)

Diagram A3-2 Composition of Private Consumption.

	Food	Services	Non-food manufactures
Guatemala	45%	32%	23%
El Salvador	52	23	25
Honduras	45	27	28
Nicaragua	44	24	32
Costa Rica	47	21	32
U.S.A.	21	49	29
U.K.	28	39	33

Sources: United Nations (E.C.L.A.) 1963 data; "The Process of Industrial Development in Latin America" op. cit., p.121.

Appendix 4: The Central American Common Tariff

As background to the thesis a good deal of work was done on the question of tariffs and tariff levels and part of this work is utilised in Ch. 3. The basis of the Central American External Tariff was the Convenio de Equiparacion Arancelaria signed in 1959 and finally ratified in 1963 with Costa Rica's accession. (1) The agreement was consolidated with the protocols of Managua and San Jose (1960; and ratified by 1963) which arranged an agreed sliding scale for tariff harmonisation. The transitional period was completed as had been agreed in 1966 and only a small number of items were subsequently outwith the common tariff framework: accounting for 16% of total external imports. The classification system (NAUCA) is very similar to the United Nations system (SITC) and complete harmonisation is likely in the near future.

From an economic point of view the basic characteristic of the tariff is that it consists for most products, of two parts, a specific and ad valorum element. The former is usually, by far the most important element in the tariff. This is in order to avoid tax evasion by importers under-invoicing imports,

out of [illegible]) However, one implication of specific tariffs is that the ad valorum equivalent tends to fluctuate considerably depending on import prices (2) and furthermore, is insensitive to quality differences and different price lines within product categories at the seven or eight digit level. However, there are very few complicating

(1) SIECA: "Arrancel de Aduanas Centroamericano" 1966.

(2) We have used cif prices from trade statistics as the nearest measure.

factors by way of other protectionist instruments: there are very few quotas and multiple exchange rates operated only for a short time in Costa Rica.

The level of the Common Tariff and Changes over Time

The main weight of research was placed in a study of external tariffs in 1966 and this involved looking at the main tariff divisions that were heavily involved in regional trade, [illegible] at the end of this appendix). These results are compressed into a smaller number of categories for display in Diagram 3-18 in the text. The major points of note regarding the structure are:

(i) the tariff is sharply escalated with very high nominal tariffs on manufactures which are actually produced; and negative protection with export taxes (albeit combined with prohibitive import tariffs in reserve) for the major commodity exports. (1) In as much as non-competitive raw materials are concerned and non-produced manufactures (e.g. capital goods), tariffs are, again, very low.

(ii) there is, however, very considerable differentiation within tariff categories depending upon whether or not the goods are produced locally.

(iii) the structure is subject to constant change, as new products are introduced and a protective tariff is imposed. It should, also, be mentioned that in 1968 a 30% surcharge was placed on 'non-necessary' imports and a 20% voluntary surcharge on the rest.

How do we arrive at a general evaluation of the tariff level and of its significance in comparative terms? This is extremely difficult

(1) Really this concerns only coffee, for which the export taxes are Guatemala (9%); El Salvador (11%); Costa Rica (7%); Honduras (10%); Nicaragua (2.5%). There are small special taxes on bananas (under 1%) and on fish and precious metals.

because different countries may have complex exchange rate regimes or over-valued currencies, different degrees of under-utilisation of tariffs, non-tariff obstacles to trade and other factors which make comparison very difficult. However, one of the most difficult problems is to get an agreed 'weighting' of tariffs since the subdivision of tariff categories is very arbitrary and mere arithmetic averages indicate nothing more than the degree of subdivision of product categories; an administrative, not an economic factor. (1) However, whatever weighting we choose presents problems. If we weight by the importing countries' volume (or value) of imports, this may mean that the most heavily protected goods have very little weight, as import substitution has proceeded to an advanced degree. Also, the structure of imports is itself affected by the tariff level unless the elasticity of substitution between imports is zero. The effect of these two influences is to bias estimates downwards. (2)

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(1) B. Balassa: "The Structure of Protection in Developing Countries" op. cit. H. Bell: "Tariff Profiles in Latin America: Implications for Pricing Structure and Economic Integration" Praeger, 1971, pp.44-49.

(2) One way of using import weights implicitly is to derive the tariff by dividing the receipts from import duties by the value of extra-regional trade. Needless to say, it leads to wildly misleading results as a measure of protection. Nugent uses this method for Central America and concluded that nominal rates are low, quite incorrectly.
J. Nugent: "La estructura arrancelaria y el costo de protection en America Central" El Trimestre Economico Oct.-Dec. 1968, pp.751-766.
The main damage to his findings is dealt by the inability to distinguish imports which are competing with protected products and those which are duty free inputs to the manufacturing process, within the same categories (e.g. textiles and textile fibres in group 8). The apparent tendency of tariff levels to decline over time, (which he shows) is largely due to the increase in the amount of duty drawbacks or exemptions given on imported intermediate or capital goods and raw materials, and not to changes in protection.

A more relevant measure is to weight by domestic production, which relates tariffs to the production structure that is being protected. However, there are great difficulties in reconciling import and industrial census classifications; and the result is biased in the sense that the value of production of protected commodities includes and is inflated by the tariff. The structure of production is, itself, not independent of the tariff structure unless there is zero price elasticity between local products and imports. This has led to a search for an external weight - such as the world import structure but this is a sophisticated and time-consuming exercise.

In Central America, the author used the nearest thing available to a production weight, where it was necessary to group together different categories for comparison: this was the relative importance of different goods in intra-regional trade. This is a loose measure in some respects, as the values of some goods are, themselves, inflated by tariffs, and other local items do not figure in regional trade (e.g. beer and cigarettes), but it does measure production weighting (i.e. the protective significance of tariffs) without getting one into measurement difficulties. It is worth recording that there was considerable similarity between the average nominal tariffs arrived at in this way (overall 60-65%: 83% for manufactured consumer goods and 92% for foodstuff consumer goods; 34% for intermediate and capital goods) and the ECLA estimates whose weighting basis was unstated but probably either arithmetically averaged or weighted by imports:(2) My own figures were not greatly affected by arithmetic weighting of the (admittedly biased)

(1) B. Balassa and Associates: "The Structure of Protection in Developing Countries" op. cit. pp.66-67. The measure of nominal protection used by Balassa is, however, a more refined one as there is a correction for exchange on evaluation; and 'excess' protection has been allowed for by direct price comparison or other techniques where possible. Weighting within categories is in terms either of regional trade data or domestic sales data depending on the availability of information.

(2) United Nations (ECLA): "General situation and future outlook of the Central American Integration programme" op. cit.

sample. However, the effect of different weighting systems can be significant as can be seen from Diag. A4-1, which is the result of a major ECLA study. (1) Though direct comparison is very difficult Central American nominal tariffs would seem to be of the same order of magnitude as those of Brazil or Chile but rather less than the extremes of Argentina and very much higher than a low tariff country like Mexico or Uraguay or France.

As regards general changes since the inception of the Common Market, there has been a policy of arithmetic averaging of external tariffs but in many cases countries with sensitive industries have been able to negotiate a general increase in the common tariff above the previous average. This can be seen clearly from Diagram A4-2, which is reproduced from a World Bank survey. The number of increases is very considerably greater than decreases and this means effectively that low tariff countries (notably El Salvador) experience a considerable increase in their tariffs, while the high tariff countries (Guatemala and Costa Rica) experience only a small fall: however, production structures were similar pre-integration and tariff divergences were not great. However, this "increase" in tariff rates did not, in fact, mean a rise in tariffs, as can be seen from table A4-3. If the weighted average of pre-Common Market tariffs is set alongside post-Common Market '1966) nominal tariffs (both in 1966 prices) it can be seen that in almost all cases there is a significant upward revision of the rates, i.e. A-B. On the other hand, the effect of rising import prices on specific tariffs has been largely to reduce the actual nominal tariff from what it was in 1962 (rates and prices). In 30 cases out of 45 on the table, nominal tariffs

(1) United Nations (ECLA): "Customs duties and other import charges and restrictions in Latin American countries: average levels of incidence" in Multilateral Economic Cooperation in Latin America (U.N.: 62 II G3).

Comparison of Average Levels of Incidence of Import Duties and Charges in Argentina, Brazil, Chile, and France (weighted averages and simple arithmetic means)

Diagram AG-1.

Category and group	Argentina			Brazil			Chile			France
	I	II	III	I	II	III	I	II	III	III
Category I. Primary commodities	18.5	54.2	131	2.9	13.4	40	20.2	40.8	93	
1. Unprocessed foodstuffs.....	40.6	40.4	145	1.1	9.5	43	14.2	33.5	114	21
2. Raw materials.....	42.7	65.0	129	22.0	19.7	38	16.1	45.1	86	5
3. Unprocessed fuels.....	1.0	6.9	34	0.8	10.2	29	34.1	53.5	30	1
Category II. Durable, intermediate and capital goods.....	64.7	96.9	138	36.9	40.8	45	39.6	45.9	67	
1. Intermediate products.....	49.6	62.1	138	26.1	31.0	43	40.6	45.3	73	17
2. Processed fuels.....	1.2	4.0	95	22.8	29.3	30	40.1	45.5	89	7
3. Capital goods.....	78.2	84.7	130	45.6	45.1	45	37.3	40.5	44	19
4. Durable consumer goods.....	699.7	612.2	181	79.1	60.0	75	83.7	83.4	104	24
Category III. Current consumer manufactures.....	66.5	110.0	175	40.4	50.4	87	56.8	66.2	126	
1. Processed foodstuffs and tobacco.....	142.4	136.4	180	50.5	56.3	91	62.8	126.4	188	25
2. Chemical and pharmaceutical products.....	62.9	102.7	151	35.4	25.0	69	14.7	16.5	82	20
3. Other current consumer goods	63.6	108.6	175	37.3	52.0	88	55.1	64.5	118	19
Overall total.....	52.7	91.5	151	28.8	40.1	60	38.2	49.2	93	18

Source: Santiago Macario, "Protectionism and Industrialization in Latin America," Economic Bulletin for Latin America, IX, 1 (March, 1964), 73.

Diagram 102 CENTRAL AMERICA: COMPARISON OF PREVIOUS NATIONAL TARIFFS AND THE COMMON TARIFF FOR SELECTED TARIFF SUB-ITEMS, AT 1964 UNIT IMPORT VALUES

		1964			Total Advalorem					2/ Average		
		Value of imports from outside region (CA$)	Volume (Gross kgs.)	Unit Value (CA$)	1/ Guatemala	El Salvador	Honduras	Nicaragua	Costa Rica	Common Tariff	of Tariffs	Decreases	Increases
	Manufactured Foodstuffs												
	Fruit Juice	39,386	99,223	0.397	136	33	142	96	201	136	121		15
	Refined sugar	21,836	52,419	0.417	46	68	25	44	63	46	49	3	
	Chiclets and chewing gum	118,055	90,907	1.299	87	41	65	78	143	87	83		4
	Candy	133,316	116,413	1.145	97	48	74	86	161	125	92		33
	Chemical Products												
	Paints, prepared	880,171	1,551,519	0.567	28	14	49	98	36	50	45		5
	Lotions	273,345	88,569	3.086	69	34	56	69	130	105	72		33
	Cosmetics	340,164	62,862	5.411	48	26	56	75	78	77	57		20
-01	Tints, Pomades and other hair preparations	297,555	172,190	1.728	64	12	56	61	84	137	59		78
	Toothpaste	58,347	27,734	2.100	22	19	11	17	25	32	19		13
	Shaving creams and other similar products	110,115	55,145	1.986	96	30	56	17	114	126	63		63
	Bath soaps	213,794	195,106	1.088	84	32	28	39	58	75	48		27
-01-02	Washing and cleaning, non-abrasive	697,448	1,354,267	0.515	68	18	28	49	72	29	47	18	
	Nitrogen fertilizers	8,245,925	166,223,652	0.050	1	2	Free	10	10	5	5		
	Other manufactured, including mixed	6,804,970	77,236,569	0.088	1	1	Free	10	10	5	4		1
-01-	Cellophane paper	1,210,876	1,065,504	1.136	28	10	25	10	22	20	19		1
	Plastic cloth, except synthetic	1,244,172	1,281,636	0.971	20	19	144	41	58	72	56		16
	Other plastic material, Non-manufactured	5,220,948	10,214,779	0.511	Free	5	66	20	106	35	39	14	
	Insecticides and fungicides	27,171,920	40,633,088	0.669	Free	6	9	10	8	17	7		10
	Manufactured Products Classified by Materials												
	Tanned Hides	1,845,571	570,792	3.233	41	16	10	16	31	27	23		4
	Tires	7,944,565	5,270,603	1.507	Free	11	6	17	18	126	10		116
	Low-grade lumber	37,215	85,561	0.430	55	31	0.07 3/	33	27	55	29		26
	Cardboard Boxes	2,807,647	10,691,667	0.263	58	10	43	124	120	72	71		1
	Cotton Yarn, Unbleached	1,413,673	1,035,035	1.366	22	16	20	25	20	23	21		2
	Cotton Yarn, Bleached	2,733,133	885,064	3.065	20	11	11	24	11	16	15		1
	Bleached Cotton Textiles Under 80 Grams	1,066,319	373,461	2.818	59	27	28	39	33	63	37		26
	Bleached Cotton Textiles Over 80 Under 150gr.	12,133,352	4,351,043	2.787	33	28	28	40	47	64	35		29
	Bleached Cotton Textiles Over 150 Grams	5,415,728	2,529,085	2.141	76	34	28	45	60	116	49		67
	Rayon Textiles	4,960,580	2,589,319	1.916	323	61	28	204	240	140	171	31	
	Blankets, Cotton	618,497	512,731	1.206	242	43	28	93	112	163	104		59
	Towels	161,958	60,689	2.669	132	36	28	44	50	66	58		8
	Cement	1,733,905	84,210,024	0.021	58	16	106	48	52	58	56		2
	Structural Steel and Bars	7,106,019	58,404,238	0.122	5	11	22	18	20	10	15	5	
	Iron and Steel Pipe	4,551,894	17,239,734	0.264	6	12	21	23	283	23	69	46	
	Aluminum Rods and Wire	435,851	364,990	1.194	5	9	15	12	19	32	12		20
	Finished Structural Steel Pieces	841,495	2,069,947	0.407	25	21	13	12	21	54	18		36
	Windows, Etc.	286,690	152,467	1.880	34	14	21	25	27	42	24		17
	Iron and Steel Matls., Screws, Washers	2,334,558	4,740,621	0.492	16	21	Free	Free	24	36	12		24
	Steel Agricultural Hand Tools	1,886,633	1,738,378	1.085	5	21	Free	10	10	20	9		11
	Aluminum Kitchenware	316,194	129,111	2.449	22	21	46	22	20	39	26		13
	Other Thin Metal Containers	944,305	1,203,647	0.785	45	13	7	23	33	39	24		5
	Metallic Bottle Caps	1,020,555	1,020,895	1.000	10	12	11	11	22	30	13		17
	Passenger Cars	15,845,373	10,334,846	1.533	55	26	15	26	91	3/	52		
	Trucks	20,186,862	16,503,665	1.223	10	18	Free	10	56	15	19	4	
	Wood furniture, upholstered	82,553	33,559	2.460	67	18	56	53	75	67	54		13
	Other wood furniture	139,282	90,982	1.531	59	24	56	47	102	89	58		31
	Metal furniture	567,375	425,064	1.335	77	26	56		112	85	54		31
	Stockings, of synthetic fibers except rayon	635,869	63,025	10.089	134	40	56	55	89	35	75	40	
	Knit under and sleep wear, synthetics(excl.rayon)	580,452	29,104	19.944	95	18	56	70	63	60	60		
	Knit under or sleep clothing, pure or mixed rayon	41,875	3,031	13.816	129	22	56	79	77	74	73		1
	Knit under or sleep wear, pure or mixed cotton	133,878	17,187	7.759	87	29	56	81	64	87	63		24
	Outer clothing, of syn. fibers (exclud. knit)	234,483	16,409	14.290	125	22	56	78	84	90	73		17
	Clothing of wool knit (outer)	629,531	35,284	17.842	76	21	56	67	55	55	55		0
	Clothing of cotton knit (outer)	160,401	19,702	8.141	84	33	56	87	62	143	64		79
	Underwear of cotton, excluding knit	102,519	13,266	7.728	88	27	106	82	90	108	79		29
	Clothing, of cotton, pure or mixed (outer)	1,039,702	254,553	4.084	387	67	56	15	161	216	157		59
	Hats, except felt	34,179	4,388	7.789	74	31	56	59	65	64	57		7
	Belts, all types	153,562	30,320	5.060	119	34	56	61	62	110	66		44
	Corsets, Brassieres, and similar articles	1,179,345	114,134	10.333	87	25	56	42	44	137	51		86
	Shoes, leather	177,140	34,498	5.143	150	74	56	59	78	68	83	15	
	Sport shoes, cloth	70,130	59,450	1.180	133	52	56	122	234	147	119		28
	Rubber shoes	41,211	32,359	1.270	400	120	56	73	79	404	146		258
	Kitchen and chinaware, of plastic material	189,163	81,649	2.317	53	20	60	85	50	75	54		21
	Ash trays, soap boxes, household gadgets and adornments	82,887	33,219	2.495	50	20	56	80	126	120	66		54
	Bags, bottles and other containers, plastic	577,035	245,676	2.349	21	11	48	23	25	31	26		5
	Nets, furniture fixtures, plastic	825,611	526,822	1.567	10	14	18	116	42	10	41	31	
	TOTAL	160,420,180	530,422,118										

Honduras's specific duty on ply-wood, expressed in Lempiras per cubic meter was converted to kilograms using an average conversion rate of 18.18 kilograms per cubic foot.

Final Common Tariff rates have been included, although in some cases they are still under the transition periods established in the Second Protocol of San Salvador and Guatemala Protocol.

Free Trade Agreement.

Tariff legislation: Guatemala, Decree No. 1269 of January 14, 1959; El Salvador, Decree No. 2781 of January 23, 1959 and Decree No. 2867 of July 8, 1959; Honduras, Law-Decree No. 80 of May 2, 1955 and Decree No. 3 of March 5, 1958; Nicaragua, Decree No. 128 of July 1, 1955; Costa Rica, Law No. 1738 of March 31, 1954 and subsequent modifications. For Trade Data, SIECA Foreign Trade Yearbook, 1964; Costa Rica's exchange rate used CA $1.00=CR ₡5.67 in effect in 1954.

Reproduced from World Bank Report (Country) 1967 op. cit.

Diagram A4-3 Central American Tariffs

(NAUCA)	A Nominal Tariff at 1966 input prices	B Average of pre common market tariffs- 1966 input prices	A-B	C Pre Common Market Tariffs at 1962 input prices	A-C
(Clothes)					
841-01-02	90	39	+51	106	-16
02-02	60	42	+18	120	-60
02-05	75	52	+23	117	-42
03-02	77	76	+1	125	-48
03-04	60	79	-19	114	-54
03-05	70	26	+44	143	-73
04-05	105	73	+32	134	-29
05-06	153	146	+15	208	-45
11-01	58	70	-2	110	-42
19-06	56	46	+10	65	-9
Perfumes etc.					
552-01-02	89	44	+55	86	+3
01-03	76	62	+14	72	+4
01-05	125	60	+65	174	-49
01-06	34	21	+13	31	+3
01-07	110	36	+84	123	-13
02-01	68	43	+23	89	-21
02-03	82	42	+40	101	-19
Textiles					
652-02-03	67	42	+25	65	+2
652-02-04	70	37	+33	65	+5
Machinery-electrical					
721-02-01	18.5	12	+6.5	22.5	-4
Chemical products					
599-01-01	29	22	+7	22	+6
599-01-03	73	35	38	66	+7
599-02-00	0-20	5	-	-	
Paper products					
642-01-02	50	33	+17	47	+3
Cement					
661-02-00	42	28	+14	55	-13
Metal Manuf.					
699-02-01	50	25	+25	35	+15
01-01	17	11	+6	15	+2
12-01	9.5	9	+.5	8	+1.5
14-01	46	25	+21	46	-
21-06	55	20	+35		
29-06	37.5	15	+22		

Diag A4-3 contd.)

(NAUCA)	A Nominal Tariff at 1966 prices	B Average of pre common market tariffs - 1966 prices	A-B	C Pre Common Market Tariffs at 1962 prices	A-C
Manuf. Articles					
899-07-01	85	43.5	+ 41.5	73	+ 12
07-03	105	60	+ 45	134	-31
08-01	36	38			
11-01	45	44	+ 41	37	8
11-03	75	22	+ 53	81	-6
15-09	88	22	+ 66	9	-7
Veg. oils					
412-03-07	57	50	+ 7	73	-16
Iron & steel					
681-13-00	19	60	-41	17	+ 2
Unmilled maize					
044-01-00	110	100	+10	140	-30
Rayon etc.					
653-05-02	105	60	+45	210	-100
Cotton & cloth					
651-03-01	27	21	+8		
651-01-00	147	13	+1.7	18	-2.3
Sweets etc.					
062-01-01	70	50	+ 20	100	-30
01-02	130	102	+ 28	146	-16
Furniture					
821-01-02	30	100	-70	45	-15
01-03	98	55	+ 43	105	-7
Fertiliser					
561-01-00	5	2	+3	6	-1
09-00	5	5	0	5.5	- .5
Paints					
533-03-01	41	37	+ 4	45	-4
Paper & box					
641-03-01	40-45	30	10-15	-	-

have, in fact, fallen since 1962 (A-C), despite tha fact that in some cases the tariff rate was still in the process of substantial upward revision. Thus it cannot be said that Central America is significantly more highly protected than it was before the inception of the Common Market: indeed, many industries seem to be having no problem of managing with lower protection. This is fairly clear proof, in fact, that the whole of the nominal tariff rate does not perform an effective role in protecting at a predicted level. It also leads on to the next aspect of the question of protection, which is the extent to which nominal tariffs actually do measure differences in prices between domestic goods and competing imports as they should do if both are of significant volume and are homogenous and identical products. As has been explained in the text, the reasons for expecting "water in the tariff" are real, and substantial in some cases, and some method of quantifying the effect is clearly desirable.

The approach adopted here is to look in detail at the tariff levels for one year (1966) over an extensive sample. First of all a large number of products were selected (about 140) at the seven digit level. They represented the sub-categories of the main three digit categories appearing in intra-regional trade. The nominal tariffs for 1966 were calculated, using the average cif import prices (extra-regional) and the specific tariffs to calculate the ad valorum equivalent and adding the ad valorum element to it.

To avoid excessive computation only sub-items of over $250,000 value were investigated. This was somewhat arbitrary, but the final number of items (seven digit) is substantial and includes some cases of eight digit sub-items, where they were particularly important. The coverage is

approximately 82.5% of the forty, three-digit groups and 75% of total intra-regional trade. Several sub-items and smaller items of particular interest were included.

Intra-regional trade data is also very useful for calculating local prices. Prices could be estimated from local sources using industrial census data to get ex-factory prices. However, using the cif prices of intra-regional imports has obvious advantages. First, the trade between Central American countries is given in SITC items as are extra-regional imports and, thus, there is no problem of trying to reconcile different systems of nomenclature as between industrial production and trade statistics. Secondly, the use of comparisons between cif intra-regional and extra-regional prices is a direct measure of the competitiveness of regional and extra-regional prices at the point of entry, whereas a direct comparison of average ex-factory prices with cif import prices is not comparable, as the local producers would then have a transport cost advantage (2x the port to capital transport cost) and neighbouring producers would have transport cost disadvantage (their factory to the importing border or cif minus fob). These transport cost factors may be very considerable in the Central American context where roads are only just being improved beyond a primitive level. However, in order to make a price comparison, it is necessary for there to be a substantial volume of goods traded both regionally and extra-regionally so that there is effective competition operating (we assumed that external trade must be 1/5 of the total).

The data thus provides us with a means of calculating the ratio between "Central American" and "overseas" prices at the point of entry to another Common Market country.

This attempt to assess protection by evaluating local 'prices' is open to various criticisms:

(i) the average price of intra-regional and extra-regionally traded products may be comparing quite different things. Even at the seven (or even nine) digit level, import categories can contain a considerable array of products - for example, even specific categories like tyres, steel tubes, nitrogenous fertilisers, let alone timber or fresh fruit comprise a large range of product mixes and sizes.

(ii) a difference in price could be explained by a difference in quality between imported and local goods. Central American goods are often of shoddy quality and Central American producers may concentrate on low quality lines leaving the high quality lines to be satisfied by specialised imports. Economists have, frequently, used this argument about quality to avoid dealing with the "water in the tariff" problem.

(iii) protection can take other forms than tariff or quota protection e.g. preferential government procurement, subsidies, tax concessions - all of which keep down the domestic price while protecting the firm against overseas rivals in less favourable circumstances.

(iv) the 'average' cif import price may conceal the fact that there are particular low cost suppliers which pose a direct threat to local producers and against whom protection is considered necessary, especially as there may be a good deal of high cost importing by agencies tied in various ways to suppliers in the USA.

These criticisms are, at least partially, met in two ways:

(i) in addition to looking at the average import price, the lowest import price was also computed (at least for supplies constituting over 1% of the total). This was useful from several points of view. First, it means that protection against low cost or "dumped" imports can be taken into account. Second, it is also true that the cheaper suppliers to

Central America (from the Latin American countries and the Far East) are more directly comparable in quality to local products.

(ii) an attempt was made to compare tariff and price changes over time. If the tariff seems to rise over time due to adjustments in the rate, then this would appear to indicate a concern to maintain the protective effect of the Common Market's external tariff. If, on the other hand, the external tariff is observed to fall substantially over time, this could scarcely be compatible with the assumption of an absence of "water in the tariff" (unless, of course, the "infant" industry was growing up very quickly). As we have already indicated, there is good reason to suppose - based on the effect on rising import prices on an external tariff which is largely "specific" - that, in fact, the ad valorum rates on many products are declining rapidly with minimal effects on local producers. If this hypothesis is borne out then there would appear to be substantial 'slack' or "water" in the tariff.

(iii) where possible direct comparisons between prices ex factory (or retail) and imported prices in the shops can be made.

The nominal tariffs at the seven digit level are set out in the work sheets and the three digit arithmetic rates and weighted averages (calculated from them (by the relative importance in intra-regional trade) in Diagram 3-18. The nominal rates tend to be high - often over 100%. Weighted averages for the following categories are:

Finished manufactures for consumption	83%
" " " industrial use	34%
Foodstuffs and crude materials	92%

and overall 60-65%. The arithmetic averages of the sample are similar.

The comparison of nominal tariffs and levels of local prices are instructive. As we hypothesised originally, there is very little relationship between the level of 'implicit protection' (column C) and the nominal rates. A spearman rank coefficient for figures at the three digit level was -.05, indicating a complete absence of correlation (ranking in columns B and D).

The magnitude of the gap between the nominal tariff and the "implicit" rate is also extremely large: in the case of finished manufactures for consumption the Central American cif prices are 20% less than world market prices (taking into account the proviso that quality changes/product composition changes may be important). In the case of intermediate goods, however, there appears to be need for some protection on many products.

It is possible to make an analytical distinction into two types of product. Generally, local prices tend to be lower in the more traditional import substitution consumer goods industries, where there is strong competition between regional producers but not from outside; clothes, footwear, cotton textiles, furniture and lumber, perfumes, soaps, cosmetics, pharmaceuticals, leather, cotton yarn/thread, almost all foodstuffs, vegetable oils etc., and miscellaneous manufactures like boxes, matches etc., margarine, sweets, cigarettes.

Nominal tariffs tend to be more relevant if intermediate goods are concerned, where, usually, overseas imports are large enough in volume to set prices: tyres, most construction steel products (sheets, tubes, wire), jute sacks, fertilisers, miscellaneous manufactures - like umbrellas, regfrigerators, blankets/rugs/tufted textiles, rayon products and synthetics, most steel and metal manufactures (tanks, machetes), copper wire, lead tubes, plastic goods (cellophane, plastic fabrics), electrical goods

(TV parts, batteries), glass bulbs, glass bottles. As already suggested, there are two reasons why this first category might be explained away in economic terms:

(i) the "water in the tariff" may consist of quality differences between regionally and extra-regionally traded products,

(ii) the 'average' cif import price may conceal the fact that particular low cost suppliers pose a more direct threat to local producers in directly competitive lines.

Column E shows the relationship between prices of imports from the cheapest sources (with over 5% of the supply) and local prices. In practice, the findings were not significantly affected. In the case of several otherwise 'competitive' products (perfumes and cosmetics; some cotton cloth; boxes; ballpoint pens; industrial soaps; paints) there do appear to be cheaper supplies which undercut Central American producers. However, the previous generalisations still hold: for almost all the 'traditional' goods, there remains substantial 'water' in the tariff.

(Interestingly, very many of the 'cheaper' goods come from Panama, Colombia and Mexico, reputedly the most efficient manufacturing countries in Latin America).

A final means of cross-checking the above findings was to use directly calculated ex-factory prices and to compare them with import prices. There were two or three industrial sectors in which this was possible. First, a detailed study of the cotton textile industry had been undertaken in the middle sixties. (1) My own studies showed that the two main products,

(1) SIECA (Joint Planning Mission): Estudios Industriales: "Programa de Desarollo de la Industria Textil de Hilados y Tejidos Planos de Algodon" Guatemala, 1965.

bleached and unbleached, both had a weighted average cost advantage over 'overseas' products of about 20%,

Unbleached - 13%)
Bleached - 20%) weighted average 19%

The SIECA Study gave the following relationship (in this case comparing ex-factory prices with import parity)

Batista	-(35%)
Zafino	-(34%)
Poplin	-(39%)
Cretona	-(50%)
Manta	-(50%)
Drill	-(34%)

Although the orders of magnitude are greater in this case, the conclusion is the same: that despite a tariff of 70% or more, local prices are substantially less than those of imported goods (before tariff).

Second, the firm which owns most of the fertiliser production in Central America recently published its case for a tariff increase,(1) claiming that 5% was inadequate and asking for 25%. My own surveys had indicated that 25% was, in fact, the figure by which the local prices of nitrogenous fertilisers were greater than those of imports.

Third, a few products, which were directly comparable as between the industrial and trade classification were cross-checked as regards 'local prices' updated census information on Salvadorian industry. The following prices were obtained:

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(1) "Necessidad de protection aduarera" (unpublished booklet prepared by the company) 1965.

	Census	Intra-regional trade data
Margarine	¢ .6 p.kg	¢ .45 to .5 p.kg
Bleached cotton thread	¢1.25 p.kg	¢1.2
Crude steel	¢ .145	¢ .16
Steel wire	¢ .15	¢ .2

There are insufficient products for which direct comparison is possible, to draw any conclusions, though there is abundant evidence from other sources pointing the same way.(1) It does appear that our method of assessing local prices does not lead to serious discrepancies.(2)

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(1) On a more general level, the UN did a comparative study of US/Latin American prices, in which Guatemala was one of the countries of reference. The UN considered that the distortive effect of the Latin American exchange rate situation was such as to forbid direct comparison. Their solution was to take food as a common base and to compare the hypothetical expenditure required to purchase the same goods and services. What is being compared, is the ratio of price X over the price of food in US/Latin American Locations. It could be of course, that Latin American food prices are noticeably higher or lower than in the US and that would invalidate the exercise. However, on this basis, the Guatemalan prices (on average) are in rough parity with US prices, the difference being insignificant (but not for particular products especially investment goods and non-alcoholic drinks). A direct comparison of prices at the free exchange rate indicates that products such as beer and matches and paints are substantially more expensive but others like footwear, cotton fabrics, woollens and cement are of the same order of magnitude. However, it was impossible in this exercise to separate out "local" and overseas products. Guatemalan prices also, one assumes, include prepaid duty. A repeat of the same exercise with a "parity rate" based on ECLA study of purchasing power, has the effect of "inflating" local prices by about 25-30%. However, the overall picture is one in which Guatemala prices are not seriously out of line with the USA, despite the very high tariffs on consumer goods. "A measurement of price levels and the purchasing power of currencies in Latin America 1960-62" Economic Bulletin for Latin America, Oct. 1963, pp.195-237.

(2) It is useful to note also the following anecdotal information: (a) e.g. with regard to cosmetics and toiletries the World Bank has commented ..."the prices of toiletries appear to be not out of line with prices for similar brands in the USA" World Bank Report (Industry) op.cit. p.31. (b) with regard to clothing, a recent study of export prospects for Guatemalan products has shown that Guatemala's hosiery (underwear mainly) could sell competitively in the United States against cheap Asian competitors; as well as the other commodities. Informe Economico, Banco do Guatemala Oct.-Dec.1969,p.32. (c) El Salvador sells substantial quantities of towels competitively in W. Europe. All these products are heavily protected in Central America

Effective Protection

We need to look at the value added (wages and profits), as the addition to national income of scarce factors of production which is 'protected', not the total value of production. Material inputs, themselves, carry duty and a tariff on the final product has the effect in part of cancelling this lower stage tariff. The formula used by Corden [1] for calculating the "effective protection" and thus incorporating these two effects is, where Tj is the effective rate of protection of comparable good j

$$Tj = \frac{tj - aij\ t_1}{V_1}$$

where tj is the nominal rate on product j

aij is the ratio of the value of a given input i to the value of the final output j under free trade conditions (i.e. the input-output coefficient)

t_1 is the nominal rate on the input

V_1 is the value added per unit/at world prices.

Expressed differently, "for given world market prices this formula will indicate the excess in domestic value added obtainable by reason of the imposition of tariffs as a percentage of value added in a free trade situation", [2] thus

$$Ei = \frac{V_1 - V_1^1}{V_1^1}$$

where V_1 = value added in the post tariff situation

V_1^1 = value added in the "free trade" situation

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(1) W. Corden: "The Structure of a tariff system and the effective protection rate" Journal of Political Economy, 1966, and "Effective Protection", Oxford, 1971. also, I. Little, T. Skitovsky and M. Scott: "Industry and Trade in some Developing Countries" op.cit. Appendix 5.

(2) B. Balassa: "Tariff protection in industrial countries : an evaluation" Journal of Political Economy, 1965, p.577.

Corden set the conditions which are necessary to ensure rigorous comparisons of effective protection on the above definitions:

(i) that physical input-output relations are fixed over time and between economies, which, in turn, presumes constant returns to scale,

(ii) elasticities of demand for all exports and supply for all imports are infinite. For very small countries like those of Central America, this is justifiable, i.e. prices of exports and imports are given.

(iii) it is implicitly assumed that 'value added' does reflect the contribution to national income of factors of production. This implies that factors of production are in surplus, so having no opportunity cost. This may be true of unskilled labour but not of capital and skilled labour. The latter two are also overseas inputs to some extent and their earnings are repatriated, not contributing to national income. These problems can be partly met by treating the 'surplus' factor as a traded input in infinitely elastic supply (i.e. having a fixed price) and measuring only effective protection of the scarce local factors, capital (and skilled labour).

(iv) the most crucial assumption is that the internal price is given by the foreign price cif plus tariff. Corden and others acknowledge the fallibility of this assumption; that tariffs have redundant elements ("water in the tariff"). Since a redundant tariff has no effect of any kind except as an insurance to protected industries against falls in import prices, all calculations should ideally be based on the utilised parts of tariffs, an ideal which requires detailed price data and which may not always be practical . It is important also in that this consideration applies both to the final product and to domestically produced inputs.

There are, however, serious practical and theoretical problems in actually making any calculations:

(i) The first assumption is clearly untenable and raises practical difficulties. Where do the input-output coefficients come from? Data in developing countries is unreliable and, as we have already recorded, there is virtually nothing by way of raw material for a Central American input-output table. The usual technique is to borrow from industrial countries but in these countries the scale of operation is often very different, the technology is more advanced and a different price structure is conducive to substitution amongst inputs.

(ii) Even if we are able to dispose of the problem of factor price distortion and the problems presented by surplus labour, there are other difficulties. There is the problem of non-tradeable goods, such as electricity. One solution (the "Corden method") is to treat non-tradeables as part of value added; another is to treat them as raw materials in infinitely elastic supply, which tends to distort effective protection by ignoring the value added contribution of fuel and power. In Central America fuel costs are very largely imported oil costs and treating power as a raw material seems opposite.

Also, the return to capital may include an element of "excess profit" or economic rent in value added and we may, with a high rate of effective protection, be measuring monopoly profit rather than 'efficiency'.

(iii) Estimation of the protection of raw materials is greatly confused by the very large duty drawback exemptions for most new, and many existing industries. The criteria for exemption are listed in Diagram A4-4 and McClelland's survey indicated that the following industries were very largely exempt entirely from duties on imported raw materials; cardboard and paper products, rayon and synthetic goods, basic chemicals and fertilisers, and

Diagram AG-4

CENTRAL AMERICA: SUMMARY OF PRINCIPAL EXEMPTIONS IN CENTRAL AMERICAN AGREEMENT ON FISCAL INCENTIVES, 1966 [1] FOR NEW INDUSTRIES

Category and Description of Enterprise	Exemption of Custom Duties and Related Charges on Imports: Of Machinery and Equipment	Of Raw Materials, Semi-processed Products and Containers	Of Fuel for Industrial use, except Gasoline	Exemption on Income Tax and Profit Tax	Exemption on Taxes on Assets and Properties
Group A Those producing raw materials or capital goods, or those that produce consumption goods, containers or semi-manufactures containing at least 50 percent materials of Central American origin.	100 percent for 10 years for Honduras; but 8 years for other countries.	100 percent for 5 years for Honduras, but 80 percent for other countries. 60 percent for additional 3 years, and 40 percent for additional 2 years.	100 percent for 5 years.	100 percent for 8 years for Honduras, but 6 years for other countries.	100 percent for 10 years for Honduras, but 8 years for other countries.
Group B Those that produce consumption goods, semi-manufactures or containers, provided they make significant net contribution to the balance of payments, have a large value added even if they have a a high proportion, in value terms, of raw materials, semi-manufactures or containers produced outside the region.	100 percent for 8 years for Honduras, but 6 years for other countries.	100 percent for 3 years for Honduras, but 80 percent for other countries. 50 percent for additional 2 years.	100 percent for 3 years; 50 percent for additional 2 years.	100 percent for 6 years for Honduras, but 4 years for other countries.	100 percent for 6 years for Honduras, but 4 years for other countries.
Group C Those not meeting conditions under Group A and B; or that only assemble, wrap, cut or dissolve products; or those listed in Annex I of the Agreement, namely: non-alcoholic drinks, wines, manufactured tobacco and toiletries.	100 percent for 5 years for Honduras, but 3 years for other countries				

[1] Terms set forth in Central American Agreement on Fiscal Incentives, 1962, as modified by protocol approved by Central American Economic Council, September 1966.

Source: reproduced from World Bank Report (Industry) 1967

miscellaneous fertilisers; basic iron and steel; metal products; electric equipment; and miscellaneous goods mostly plastic manufactures, women's underclothes, tyres, jute bags. Duty exemptions on raw materials has, of course, the effect of raising the effective protection for a given nominal rate.

(iv) "Water in the tariff" prevents meaningful measures of effective and of nominal tariffs. In order to circumvent this problem a small sample of products was chosen which appeared to fully utilise the tariff.

Calculations were made for this limited selection of products with what data was available. Effective protection was calculated on the assumption that all raw material inputs enter duty free. Value added is calculated conventionally to exclude fuel and power, but including profits, depreciation, interest, wages and salaries, whether or not these factor payments are wrongly valued or are foreign costs: this last factor efficiently deflates the true value of effective protection. Coefficients are taken from industrial census data (Diag. 3-19 in text).

The results show extremely high rates. Though absolute values are not of great significance, relative values are. The importance of these findings is explained in the text.

Appendix 5: Trade Diversion and Trade Creation

Conventional customs union theory makes a distinction between trade "creation" and trade "diversion" in intra-regional trade flows. In quantification of these, the main reference work is Balassa who studied intra-regional, extra-regional and overall income elasticities of demand in the EEC, pre- and post-union. (1)

	1953-59	1959-65
Overall Import Elasticity of Demand	1·8	2·1
Intra-regional "	2·4	2·8
Extra-regional "	1·6	1·7

An overall rise in the IED is considered evidence of trade creation, of which there is some due to greater regional trade, and some "gross trade creation" as a result of a general tendency to substitute overseas imports for domestic production. A rise in intra-elasticity offset by a fall in the extra-elasticity is evidence of trade diversion. However, there is no indication of how the dichotomy between 'diversion' and 'creation' leads to quantification of gain and loss. To some extent "trade diversion" tells us to what extent increased regional trade has come from import substitution, though it would measure 'net' import substitution rather than 'gross' import substitution. If regional trade involved substituting overseas imports which had a high component of foreign inputs and capital

(1) B. Balassa: "Trade diversion and trade creation in the EEC" Economic Journal, March, 1967. op. cit.

goods it would not result in a discernable fall in the extra-regional IED. Conventional trade theory would tend to classify 'trade creation' and 'trade diversion' as positive and negative respectively in welfare terms. We could reverse the two: 'trade creation' has no positive effect in mobilising unemployed resources in general and saving foreign exchange: 'trade diversion' involves both..

A study has been made by Wilford of these elasticities in Central America.(1) Wilford's findings indicated the following elasticities for the region as a whole:

	1953-61 (1955-61)	1961-67
Overall imports income elasticity of demand	·9(·6)	1·4
Inter-trade	3·6(3·7)	4·8
Extra-trade	·9(·7)	·9

The results indicate substantial trade creation without trade diversion. However, the findings were of very dubious validity;

(i) very short time periods were taken (1953-61 and 1961-67) though the original Balassa study also had 6-year periods:

(ii) by 1961, the effects of the Common Market were already strong and the two periods chosen could not be considered as a fair division into pre- and post-union periods,

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(1) W. Wilford: "Trade creation in the Central American Common Market" Western Economic Journal 1970 pp.61-69.

(iii) the overall IED is not constant and was known to be affected by the growth performance overall. 1961-67 was a high growth period in agricultural exports quite independently of regional trade, and this may have affected overall import levels. Also in 1958-60, when there was a recession, imports fell sharply, deflating the IED without there being import substitution (see diag. below).

In order to show the vulnerability of the results to the arbitrariness of the time period chosen, the figures were recalculated for the 1950-58 period, pre-integration, and for 1962-69. This gave two income elasticities:

	1950-58	1950-60	1960-69	1962-69
intra-regional trade	2·1	2·4	(4·6)	4·5
extra-regional trade	2·3	1·3	(1·0)	1·2
all trade	2·25	1·5	(1·4)	1·4

These figures are substantially divergent from Wilford's. Trade diversion is seen to be important. Indeed, the figures indicate no trade 'creation'. However, the calculation is dependent on the choice of time periods. Even a two year aberration from a base period is highly significant. But comparing 1950-58 and 1962-69 which excludes the transitional period between, there has been a fall in the IED for trade as a whole, with the rise in IED for regional trade only partly offsetting that for extra-regional imports.

The true importance of trade diversion can be seen by looking at the trends in imports, from outside and inside the region as they affect individual product categories (Diag.3-9 in the text). There is not the information available to compile income elasticities of demand for each product, but the data does suggest the most important features. There are some cases

where the Central American Common Market is evidently developing largely on the basis of product specialisation rather than inter-industry specialisation".(1) This is seen clearly in Diag.3-10 in the text. There are several spectacular cases within product categories; Salvador dominates the textile industry, selling largely to Guatemala; Guatemala dominates the synthetic textile market with Salvador as the main recipient. Within the stocking industry and knitwear there are similar reversals indicating product specialisation at a fine level of disaggregation.

Other indirect evidence of the evidence of trade creation is that intra-regional trade has led to a stabilisation and in some cases a reduction in prices in commodities such as textiles. Most of the trade has been in products which are generally not subject to economies of scale and whose production is relatively simple. "Thus, at present, economic integration, by creating a large market, has encouraged a certain degree of competition and specialisation, and the higher protection associated with it has not led to generally higher prices for purchases;"(2) "There has tended to be within the region itself a fairly high degree of competition. The increased regional competition has helped to achieve relatively high levels of efficiency and low costs ... . The general competitive situation which has developed in this industry (textiles) as existing plants throughout the region seek to take advantage of the large market ..... has apparently resulted in limited price increases if at all."(3)

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(1) World Bank Report on the Central American Economies"; op. cit.(Main Report), Appendix A, p.9.

(2) Ibid. (Introduction) P.(ii).

(3) Ibid. (Report on Industry), p.19.

The same is true of processed foods, shoes and clothes.

To conclude this section, a good deal of circumstantial evidence has been looked at, which indicates that part of the growth of regional trade is "trade creation", a result of competition between existing producers; and some is also direct import substitution of extra-regional supplies ("trade diversion"). No quantifyable result seemed possible: McClelland makes an educated guess of 50% of the trade flow being of an import substituting variety and it is difficult to see how one could improve on the estimate.

Appendix 6: The Cost Composition of Central American Industrial Production

In calculating the tables in this appendix, the following assumptions were made:

(a) the ratio of imported to overall costs is computed at local rather than world market prices. It is, of course, possible that for a protected good, foreign exchange payments for inputs and factors could exceed the cost of the finished good at world market prices, bought in the absence of tariffs. In this case there would be negative foreign exchange saving. However, here we are concerned with the national income effect which may well include tariff protected factor payments, and the cost of protection is dealt with separately, later,

(b) the coefficients that apply to production on average and in the year of the census, are applied to that part of the production which is exported to Cómmon Market partners in 1968,

(c) we ignore iterative procedure in calculating the local/import content of raw materials,

(d) all wages and salaries are regarded as 'local' payments though some remuneration of overseas management is doubtless included, in practice,

(e) fuel and power are assumed to have a 100% import content though both oil refining and electricity generation have a small local value added too,

(f) packaging is assumed to be split 50/50 into local/import costs, an approximation based on the Costa Rican and Honduras censuses,

(g) Guatemalan data is not available and so the coefficients derived for El Salvador are applied to that country, as an area with a comparable degree of industrialisation,

(h) there are very few products from other CACM countries which figure as intermediate goods or raw materials but where they appear they are treated as "imports" to avoid double counting.

To some extent the import - content of marginal new firms is greater than the average. Examples can be given of the very intensive use of imported components in certain products.

Two examples can illustrate this; both heavily involved in regional trade; FERTICA, a fertiliser firm, and INPELCA which produces (or assembles) fluorescent tubes and glass bulbs.

In the published accounts of Fertica, figures indicate that less than 15% of the value of final sales is actually an import saving. (1) Thus at 1965 production:

	Costa Rican Branch	El Salvadorian Branch
Sales	$5,868,000	$1,682,000
Imported Raw Materials	$4,033,000	$1,541,000
Overseas payment of interest on Finance of imported capital equipment	$ 775,000	$ 204,000
Apparent Balance of Payments gain =	$1,060,000 =	$ - 63,000

Even at current prices the net saving (which finances profits for the Panamanian H.Q. and local wages and salaries) is a small proportion of turnover. However, imports are 25% cheaper than Fertica's products and so

(1) SIECA: "Application for a tariff increase by Fertica" SIECA/C/XXVI/OT 4 Guatemala 1965.

the economy in fact loses foreign exchange (approx. circa $1m) p.a.

Most chemical plants, in fact using bought-in raw materials and which enjoy a substantial tariff protection probably lose foreign exchange (net), and some cause a fall in real income.

The low local value added in assembly industries has given rise to friction between the states with one partner complaining that they are foreign goods merely repacked and labelled locally, and a special protocol has been drawn up to prevent goods abuse. A documented case is that of a "Special" Industries - fluorescent tubes and glass bulbs. (2) In 1967, Salvadorian statistics indicated that INPELCA had roughly the following breakdown of costs:

Value of production $2,667,651 (of alternative imports $1,176,000)

	Local	Overseas
Raw material inputs	72,065	1,235,576
Wages and Salaries	300,000	40,000
Packing etc.	60,000	100,000
Fuel and Power	10,000	30,000
Interest, profit, depreciation	85,000	700,000
Totals	530,000	2,130,000

(2) SIECA: "Estimate of demand in relation to installed capacity of Sylvania (Costa Rica) and Phillips (El Salvador)" SIECA/SEPAO/DI 3-69: "Estimate of regional demand for glass bulbs and its relation to capacity installed" 1-218-A (SIECA) Guatemala, 1968.

It is difficult to be precise but on reasonable assumptions the whole operations were costing $1,000,000 p.a. in foreign exchange (net), for which the return was a gross contribution to national income of local payments amounting to under $500,000, some of which represented rewards to scarce resources that could have been used elsewhere, i.e. there is a large loss of real income (net).

It should be stressed that we are leaping ahead here to embrace the cost of protection and that is a different concern. In the examples quoted there is, in terms of local prices, a national income gain to the producer country ($530,000 out of $2,668,000) and that is all that we have, so far, been concerned with. However, it must be stressed that there are many firms with even lower 'local' content than INPELCA and many enjoy comparable protection.

Cost Structure of Central American Industry

I El Salvador

CIIU	Category	Total Value of Production 1968	% Local Raw Materials	% Imported R.M.	% Fuel & Power	% Packaging	% Foreign Inputs (Local Inputs ↓)		% Wages & Salaries	% Residual Value Added	Men employed	No. of Firms
201	Meat Preps.	744,000	63	1	2	13	10	69	14	3	21	2
202	Daily Prods.	3,542,000	74	4	1	3	6	76	6	12	153	6
203	Fruit & Veg Preps.	647,000	25	18	-	13	25	26	12	37	33	3
206	Cereal Preps.	15,503,000	44	7	2	4	11	46	13	30	1584	125
208	Sweets	4,401,000	22	22	2	19	31	26	19	22	445	12
209	Margarine	26,069,000	43	20	43	8	27	47	7	19	545	1
	Animal Foods	16,951,000	42	39	1	2	41	43	5	11	183	6
	Miscellaneous	1,812,000	56	-	3	10	8	62	7	23	54	3
212-3	Alcohol(Beer)	17,485,000	8	4	2	11	12	13	12	63 (Tax largely)	380	1
220	Cigarettes	18,869,000	12	3	-	8	7	36	7	60 "	235	1
231-2	Spun & woven textiles	73,000,000	50	6	2	1	9	60	9	32	6470	60
233-9	Jute & other fibres	4,977,000	65	-	2	-	2	65	18	15	651	2
243	Clothes + 322	18,303,000	24	14	1	1	16	24	19	41	2501app	105
241	Shoes(synth)	14,054,000	32	22	1	3	25	33	17	25	975	33
244	Other textiles	800,000	-	36	1	-	37	-	8	55	80	1
25	Wood Prods.	insignif.										
26	Furniture	13,330,000	11	27	1	-	21	11	21	40	1400	62
272	Paper & Boxes	14,470,000	-	70	1	4	73	2	12	13	515	10
280	Printing	16,200,000	2	52	2	9	59	56	23	12	1700	75
291	Leather	7,300,000	32	26	2	-	28	32	15	25	460	29
300	Tyres & other rubber	insignif.										
311	Fertilisers	10,390,000	-	45	3	8	52	4	13	31	148	2
	Other Chemicals inorganic	260,000	13	32	1	9	37	14	8	48	26	2
313	Paints	7,082,000	-	37	-	6	40	3	8	49	165	2
319	Perfumes etc.	2,744,000	3	14	1	14	22	10	16	52	180	8
	Pharmaceuticals	9,719,000	4	22	-	15	30	11	16	43	675	16
	Diverse Prods. insecticides	13,390,000	3	61	1	5	65	5	7	23	140	7
	soaps	14,810,000									680	
321-9	Petroleum Prods.	28,600,000	-	76	4	1	80	-	3	17	80	1
332	Glass	1,225,000	-	36	1	-	37	-	32	31	185	2
334-9	Cement Prods.	9,062,000	5	2	19	17	30	13	11	46	275	1
341	Iron & Steel	13,805,000	2	72	4	-	76	2	11	9	665	1

342	Aluminium	insignif.										
350	Metal Manuf.	20,500,000	14	50	3	1	53	15	17	15	840	27
360	Mining machinery	insignif.										
370	Electrical machinery	21,900,000	2	41	2	3	44	3	13	40	570	20
383	Motor Vehics.	7,108,000	4	68	-	-	68	4	14	14	335	5
395	Records	2,284,000	2	6	1	-	7	2	18	73	121	2
399	Other plastics	8,787,000	1	45	3	1	48	2	22	28	690	17
	TOTAL also semi-manufactures	663,600,000	23	26	1	3	28	25	12	35	52000	4600
2052	Grain Milling (wheat)	19,450,000	-	overseas	-	5			3			
2053	Rice Milling	11,320,000	90	-	-	-			4			
2073	Sugar(crude)	31,923,300	47	5	4	1			10	7		
2096	Coffee Preps.	7,905	48	-					8			
2311	Cotton etc. clearing	62,700,000	66	-	1	1			2			

N.B: Imports are from all sources and could include regional trade by error

Source: Industrial Census. figures as updated in "Annuario Estadistico" 1970.

II Honduras:

CIIU	Category	Value of Production	Value added Indirect Excl Tax	Approx Fixed Invest.	% Local R.M.	% Imported R.M.	% Fuel & Power	% Packaging	% Spares & Material	% Local / Imp inputs & Sals.	% Wages	% Resid. Value added	No. Workers	Firms
201	Meat Preps	14,119,000	3,060,000	4.2m	62	-	2	1	2	62 5	7	17	464	11
202	Dairy Prods.	5,630,000	2,011,000	5.4m	36	10	5	7	3	40 22	16	22	450	11
205	Milled Prods.	45,163,000	7,820,000	6.3m	64	16	1	2	1	65 19	3	13	534	14 *
206	Cereal Prep.	8,790,000	2,490,000	2.3m	48	14	2	3	1	50 18	14	18	1133	53
207	Sugar Prods. & sweets	15,860,000	10,300,000 / 9,165,000	3.8m.	18	2	3	4	5	20 12	9	59	561	6
209	Diverse Foods	13,670,000	3,072,000	8.4m	43	14	3	10	3	48 24	14		585	16
212-3	Drinks alcohol	38,400,000	10,000,000 / 27,165,000	19.0m	6	9	-	3	1	8 11	12	70	1249	21
220	Tobacco & cigarettes	10,770,000	3,064,000 / 6,360,000	7.7m	3	14	5	14	6	10 32	13	45	406	5
231-2	Spun & woven cottons	6,645,000	3,245,000	10.8m	5	33	6	-	3	5 42	21	32	1045	5
241	Shoes	2,010,000	1,000,000	1.7m	24	22	1	1	-	25 23	29	23	419	20
243-4	Clothes	11,855,000	4,744,000	5.26m	10	42	1	2	-	11 44	18	27	1789	50
25	Wood Prods.	28,140,000	10,677,000	20.2m	38	2	4	-	6	38 12	21	29	5130	72
260	Furniture	4,436,000	1,648,000	1.5m	18	28	1	-	3	18 32	19	31	685	27
270	Paper & Pulp products	25,237,000	1,900,000	6.9m	88	-	1	-	1	- 90	4	6	456	3
280	Printing products	5,251,000	3,216,000	7.3m	6	23	1	-	-	6 24	43	27	1144	40
290	Leather Prods.	2,904,000	930,000	2.2m	46	18	2	-	1	46 21	13	20	240	14
310	Chemicals essential	816,000	171,000	1.2m	39	3	5	8	4	43 16	15	26	86	4
	Paints	1,157,000	371,000	.6m	-	47	1	10	8	5 56	12	22	64	3
	Diverse Chems.	13,466,000	6,015,000	12.0m	6	27	2	11	6	12 40	16	32	1158	16
33	Cement & other	10,055,000	5,150,000	14.0m	10	6	12	3	6	11 26	16	47	767	26
35	Metal Prods.	6,748,000	2,490,000	3.5m	4	48	3	-	4	4 55	19	22	698	21
37	Electrical equip,	448,000	327,000	.2m	-	21	3	-	1	- 25	22	52	49	4
38	Transport equip.	4,637,000	2,587,000	5.5m	-	37	3	-	3	- 43	46	16	893	36
39	Diverse Manuf.	6,270,000	1,795,000	2.9m	-	62	2	-	2	- 64	10	26	279	13
	TOTAL	288,900,000	178,000,000		27	22	2	3	2	27 30	12	31	20827	506

* Includes coffee preparation, rice milling etc.

N.B. Value added does not include services, net sales from articles sold until transport.

III Costa Rica (Some 1964 Census)

CIIU	Category	Value of Production	Fixed Investment	% Local R.M. (Inc. Packaging & spares)	% Imported R.M.	% Fuel & Power	% local Inputs	% Imported Inputs	% Wages & Sals.	% Residual Value added	% No. Workers	% No. Firms	
201	Meat Prods.	48,215,000	5.77	71	4	1	71	5	4	20	363	23	
202	Dairy Prods.	56,236,000	12.69	63	6	2	63	8	8	21	934	127	
203	Fruit & Veg. Prep.	7,222,000	2.46	11	54	2	11	56	16	17	259	19	
205	Milling	321,638,000	88.63								2349	347	
206	Cereal prep.	57,600,000	15.80	66	9	-	66	9	5	20	2665	329	
207	Sugar, sweets	87,033,000	59.6	34	9	2	36	11	17	38	3769	834	
		14,098,000	6.4								500	18	
209	Diverse	78,485,000	20.85	44	23	3	44	26	7	23	1074	143	
210	Alcohol (mainly spirits & Beer	92,058,000	28.60	6	9	1	6	10	7	77	883	47	
22	Cigarettes & tobacco	33,720,000	17.8	20	11	5	20	16	7	57	260	12	
231-2	Spun & woven textiles	43,785,000	46.1	12	35	2	12	37	19	32	1721	28	
233-9	Jute & other fibres	9,150,000	3.37	6	57	2	6	59	11	24	552	57	
241	Shoes	23,700,000	7.54	15	28	1	15	29	18	38	1797	347	
243	Clothes	60,100,000	8.08	5	52	1	5	53	13	29	2689	858	
25	Wood Prods.	32,100,000	23.00	34	5	3	34	8	28	30	1793	249	
26	Furniture	24,200,000	9.69	13	31	2	13	33	19	35	1616	414	
272	Box & Paper	21,450,000	5.48	9	70	1	9	71	12	8	430	19	
280	Printing	32,555,000	16.46	-	39	1	-	40	32	28	1452	67	
291	Leather	9,820,000	3.73	32	28	1	32	29	15	26	471	104	
300	Tyres	9,000,000	6.73	26	28	3	26	31	16	27	272	16	
311	Fertiliser & other inorgan chemicals	11,333,000		4	61	-	4	61	5	30			103
313 & 319	Paints Others	62,000,000		11	39	1	11	40	15	34	1500		
321-9	Petroleum Prod												
332	Glass Prods	4,456,000	.63	5	58	1	5	59	16	20	99	7	
334/9	Cement	18,860,000	10.14	6	35	2	6	37	20	37	859	85	
341	Metal Manuf	26,315,000	12.84	1	50	3	1	53	14	32	1011	220	
360	Machinery	11,390,000	4.14	2	42	3	2	45	27	36	516	64	
370	Electrical machinery	6,673,000	2.57	1	44	2	1	46	16	37	481	205	
383	Motor Vehics.	18,375,000	9.3	10	34	2	10	36	22	32	1560	403	
				9	45	-	9	45	17	29	642	169	

Nicaragua: Structure of Gross Value of Production, 1965

	Raw Material % Imported	Raw Mat % National	Fuel and Power	Foreign R.Mat.	local R.Mat.	Wages	Other Value Added
Food Products	6.7	54.4	5.9	12.6	54.4	12.6	20.4
Textiles	20.4	15.8	14.9	35.3	15.8	23.8	25.1
Shoes	13.6	26.4	.6	14.2	26.4	23.5	35.9
Clothing	30.0	26.6	5.1	35.1	26.6	19.9	18.4
Woodwork	9.5	35.5	5.7	15.2	35.5	23.6	25.1
Furniture	16.2	24.6	7.9	24.1	24.6	5.5	45.6
Paper & Products	61.6	.2	8.7	70.3	.2	14.4	15.0
Leather Products	10.5	44.3	2.8	13.3	44.3	18.9	23.5
Rubber Products	39.2	-	7.0	46.2	-	15.4	38.4
Chemicals	51.8	8.6	4.0	55.8	8.6	9.0	26.9
Petroleum Products	73.1	-	10.1	83.2	-	3.8	13.0
Non-Metallic Products	3.9	18.0	20.8	24.7	18.0	17.3	40.0
Metal Products	54.0	.2	7.5	61.5	.2	16.4	21.9

Annual Report of the Central Bank of Nicaragua, 1965 p.124

Appendix 7 Specific Causes of Unbalanced Development in Central America

The following factors are amongst those that can frequently be used to explain a good deal of the variation and they will be tested for relevance in a Central American context:

(a) wage costs
(b) "market potential"
(c) distribution costs
(d) proximity to raw materials
(e) proximity to manufactured supplies
(f) capital costs
(g) taxation
(h) fuel and power costs
(i) availability of skills, managerial staff, general industrial services.

(1). Wage Costs: especially in labour intensive industries, differences in labour costs should be important, though they may be outweighed by differences in productivity. However, wage cost differences are sufficiently small as to be of no significance to potential investors. As can be seen from Diag.A7-1, differences between sectors (and firms) are greater than those between countries: the labour market is highly imperfect. New investors' costs will be as much at a "negotiated" as a "market" rate. Certainly there is no evident [illegible] advantage to any one countries; the contrast with Panama is more illuminating.

(2) "Market Potential": this is a quantitative concept which measures the attraction for particular locations of an array of markets; there being an analogy with physical gravity. (1) The existence of a high "potential" would

(1) Chauncey Harris: "The market as a factor in the localisation of industry in the USA" Annals of the Association of American Geographers, 1954.

Diagram A7-1.

Average Cost of Labour by Industrial Sector (1969)

(in cents per hour)

OIU	Costa Rica	El Salvador	Guatemala	Honduras	Panama
20	30	17	33	26	80
21	33	33	47	64	96
22	56	20	20	-	116
83	31	32	34	36	-
24	31	27	36	32	67
25	32	-	32	32	68
26	35	34	41	43	66
27	27	-	-	-	68
28	53	38	67	40	90
29	32	32	31	28	49
30	-	-	-	-	-
31	41	31	61	44	103
32	34	32	69	41	83
33	37	25	41	33	83
34	68	45	33	-	110
35	31	35	33	34	85
36	42	46	38	-	173
37	33	35	36	-	90
38	35	39	40	41	89
39	43	28	25	35	75

Notes: Costs include insurance and employers' social security payments.

Source: ILO "Informe à las Gobiernos de Costa Rica, El Salvador, Guatemala, Honduras, Niceragua and Panama; Sobre El Costo de Mano de Obre en Latin America".

indicate a high level of attractiveness for "market oriented" industries aiming for a regional market. They will wish to be as near as possible to the main purchasing centre in order to maximise sales, especially if there are economies of scale in the industry.

Potential is measured for a particular location as:

$$\sum \frac{M}{d^n} \quad \text{i.e.} \quad \frac{\text{Markets accessible to producing location X}}{(\text{Economic distance from X to Market M})^n}$$

- where n is a 'power' representing the declining influence of distance.

The attraction for selling is determined by the purchasing power of surrounding markets and inversely by the "economic distance". (1) The question is what each of these variables means in practice. Some writers have used population in the numerator but this will be misleading if there are differences in income level and income distribution. (2) "National income" would be a better measure. The denominator is even more difficult, as the "economic distance" will be compounded of transport costs, risk and physic factors and other obstacles to trade. Transportation costs, themselves, are usually complex and depend on the route, product carried and type of vehicle among other things. Geographic distances have been used as a proxy for "economic distance", (3) which is reasonable only if the terrain and road system are of even characteristics throughout the area. We also need to consider the nature of the "decay function", as transport costs do not

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(1) This term is discussed in W. Beckermann: "Distance and the pattern of Intra-European trade" Review of Economics and Statistics, 1956, p.38.

(2) Colin Clark: "Industrial location and economic potential" Lloyds Bank Review, Oct. 1966; uses population as a measure. An index of population weighted by income distribution is used in A. Hazelwood: "An approach to the analysis of the spatial distribution of the market of East Africa" Oxford Institute of Economics & Statistics, November 1969, pp.243-61.

(3) Discussion in M. Linnemann: "An economic analysis of trade flows" North Holland, 1966, pp.25-30.

generally decline directly in proportion to distance: a root function may be more appropriate.(1) Of the two implicit "gravity models" used in Central America, one did not publish the model used, (2) and the other used on least squares regression of distance on cost without considering other possible functions. (3)

An attempt was made to calculate the market potential for a series of producing locations in Central America as follows:

$$\text{Potential} = \sum_{y=1}^{y=n} \frac{Mx \cdot My}{Dxy}$$

Mx is the "market" of X, the producing location
My is the "market" of Y, the consuming location
Dxy is the economic distance between them.

In this case the markets were assumed to be concentrated in the capital cities and measured by the national income (GNP). Distances between producing points (also taken to be the main city) and other consumption points were the geographic distances. All other markets were ignored. The results were retested for distances as a square root function of potential, as well as linear function.

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(1) A linear function is used in W. Elkan: "Estimating New Zealand's manufacturing output in a Common Market with Australia", Journal of Development Studies, Jan. 1968.

(2) CABEI "Central American Transportation Study, 1964-65," Vol. I.

(3) SIECA: "Incidencia del costo del transporte en los precios de los productos agricolas y industriales de intercambio dentro del mecado comun" SIECA/68/VII-5/28, Guatemala, May, 1968.

Ratios of Economic Potential and GNP (Guatemala = 100)

	GNP		Potential I		II	
Guatemala	100		100		100	
El Salvador	58		96·5		98	
Honduras I)	29)	Jointly	33·5)	Jointly	35)	Jointly
II)	17)	46	26·5)	52	32)	58·0
Nicaragua	44		46		53·0	
Costa Rica	50		37		52·0	

Given that the absolute values of the figures are of no particular significance; relative magnitudes may be, Guatemala closely followed by Salvador, is the major source of advantageous market potential; Costa Rica the least well placed. Considered relative to their GNP, El Salvador's "effective" market is greatly increased and Costa Rica's greatly reduced, though this effect is blunted if the decay function is made to operate less sharply (as a root of the distance rather than proportional to the distance).

(3) Distribution Costs: the effect of distance can also be seen from another point of view in terms of the distribution costs of one regional firm supplying the whole regional market, assuming the latter is unaffected by transport costs. In this case we are concerned to minimise $\Sigma M \times d^n$ for each location.

If we take "n" as 1 for simple illustration, we obtain the following indices —

from Guatemala	18·4
El Salvador	15·0
Honduras (treated as one)	19·7
Nicaragua	21·7
Costa Rica	36·0

The differential would be greater or less depending upon whether n is greater or less than one. However, the indices do show that Salvador has a geographical advantage being situated nearest the "centre of gravity" of the area; and that Costa Rica is strongly disadvantaged. The other three

countries having a similar ranking. We would expect on the basis of this, that regional industries, especially those with "bulky" products, would have more of a preference for El Salvador, than Costa Rica.

(4) Capital Cost: availability of capital is determined by commercial banks (who lend short term to prime borrowers at around 10%); national development institutions ('financiers!) who lend long term at 8-12%; and other sources, moneylenders etc. Inter-country differences are not great but Costa Rica (via its nationalised banking system) is strict. Honduras and Nicaragua (via theENF and INFOMAC) are noted for active promotional work with lending activities in foreign companies. (1)

(5) Taxation: the main element in taxation which affects net investment especially, is the system of investment incentives and this procedure is now being harmonised. However, personal taxation varies considerably and also company tax or existing companies. The effect on business activity is almost certainly alight: if anything personal taxation is heaviest in Costa Rica and El Salvador.

(6) Fuel and Power Costs: differences in fuel and power costs are not great in general. All five countries have oil refineries near the main production centres, which guarantees an availability of Bunker "C". Electricity tariffs have varied very considerably in the past, (2) but normally for big projects, bulk supply of electricity can be negotiated and for most production centres there is a common price.

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(1) International Business Corporation: "The Central American Common Market: projects and problems in an integrating economy" 1969, pp.43-46.

(2) United Nations (E.C.L.A.) "Comparative Study of Electrical Tariffs: Central America and Panama" E/CN 12/CCE SCS/40 1966.

(7) Proximity to Raw Materials and Manufactured Supplies: the importance of the former is difficult to assess in the absence of knowledge about factor endowments: we can only assume that they are randomly distributed. The second is not all that important yet, as input-output linkages are so few and except in textiles and clothing.

(8) "Externalities": an important explanatory factor in industrial location has always been the benefits from establishing in a built up area with available skills and infra-structure so as to realise external economies of scale. This is virtually impossible to measure but a series of indices will give one some indication (Diag 3 in the text).

Though these indicators are very scrappy, they do indicate the weakness of Honduras and Nicaragua as existing centres of manufacturing (which is compounded in Honduras as there is a split between Tegucigalpa and San Pedro Sula) and also as having a very poor road network (which cannot be explained away by low population densities, as Guatemala's is equally low). Costa Rica has advantages in respect of the literacy and level of education of its workforce.

Summary: of the various factors influencing location, only the last could be said to explain the grossly disadvantaged position of Honduras and Nicaragua, whose market potential and labour costs would not seem to be seriously unfavourable. Costa Rica's position, as a partly dissatisfied partner could be explained by market potential and labour costs but other factors, i.e. its stability and established democratic tradition, tend to act in its favour.

Appendix 7-2. Diagram showing indexes of potential

	GNP	Potential of	(I)		(II)	
Guatemala (City)	$1,645 m	Salvador	5,215			
		Honduras N	1,285			
		Honduras S	775			
		Nicaragua	1,400			
		Costa Rica	1,035			
			9,710		216,500	
San Salvador	$ 950 m	Guatemala	5,215			
		Honduras N	1,425			
		Honduras S	780			
		Nicaragua	1,263			
		Costa Rica	665			
			9,348		712,700	
Honduras N - San Pedro Sula	$ 476 m	Guatemala	11,404			
		Honduras S	403			
		El Salvador	413			
		Nicaragua	1,115			
		Costa Rica	285			
			3,356		75,520	
				Jointly		Jointly
Honduras S	$ 285 m	Guatemala	712			
		El Salvador	755	5118 m		125,300
		Honduras N	403			
		Nicaragua	456			
		Costa Rica	256			
			2,582		70,300	
Nicaragua	$ 730 m	Guatemala	1,425			
		El Salvador	950			
		Honduras N	365			
		Honduras S	505			
		Costa Rica	1,248			
			4,493		114,200	
Costa Rica	$ 820 m	Guatemala	1,025			
		El Salvador	627			
		Honduras N	295			
		Honduras S	295			
		Nicaragua	1,353			
			3,595		111,700	

CASE STUDY

Appendix I

The Cement Industry in Central America

The exercise of evaluating the benefits of a joint multinational approach to industrial (project) planning in Central America was applied first of all to cement. There were several reasons for this:

(a) First, it is an interesting 'marginal' case where the centrifugal forces of economies of scale are well balanced by the centripetal forces of high transport costs. Cement is an industry which enjoys substantial economies of scale both in the use of capital equipment and labour. However, these economies of scale are not self-evidently sufficient to justify centralisation into a unified plant because cement is a bulk 'low unit value' product which carries high transport costs. This can be clearly demonstrated from a simple numerical example. Imagine two markets, 500 kms. apart, each with a plant serving markets of 200,000 tons per annum. Take a price of $30 per ton. If production were to be concentrated into one plant of double the size then it is possible that economies of scale would reduce the cost of $25 per ton.[1] However, half the market has now to be supplied at a distance of 500 kms. and with a (likely) transport cost of 3 c per ton km.; $7.5 per ton is added to the overall average cost (including transport). Decentralisation is, therefore, more 'efficient'. This makes a whole host of assumptions about pricing policy and so on and it can also be seen that with a larger and more complex situation

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1. An approximation based on figures employed later. Also see J.S. Bain, "Barriers to New Competition" op.cit. pp.228-48.

simple hand calculations would be inadequate and a more sophisticated programming approach is called for to arrive at an optimal solution solution.

(b) The technology of cement production is relatively simple or at least fairly uniform and is particularly suitable for X-national comparisons.

(c) The industry is of key importance as a 'building block' in the process of industrialisation. The construction industry depends critically upon it and as the 'local content' of cement production is high its impact on import substitute is significant.

(d) It is one of the few important and well-established industries in Central America with a good body of data to draw upon both on the production side and from the regions' experience of intraregional trade. On the other hand, it could be argued that the issue is by now academic, there being a clear commitment by each of the Common Market countries to 'go it alone' as regards cement production. However, it is necessary to isolate two quite different questions: first, the 'static' question of whether, given the existence of high fixed capital costs in cement production in the Central American market, there should be 1, 2, 3, 4, 5, ...n producers: second, the 'dynamic' question of whether, given the existence of a group of 'national' producers, any expansion of capacity can be phased to give a better degree of utilisation taking into account the possibilities for regional trade and planned staggering of investment.

Hypothesis:

There is some a priori evidence to support the argument that the present 'national' policy[1] has produced an inefficient and costly distribution of plant.

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1. This is something of an oversimplification: the volume of intraregional trade is growing.

(i) levels of capacity utilisation have been generally low. From diags. 1a to 1e, it can be seen that rarely over the last decade or more has capacity utilisation for the region reached 70%; Guatemala, Honduras and Nicaragua, especially the latter, being below this level. It is, however, difficult to be dogmatic about a 'reasonable' level for the cement industry;[1] a UN study considered 90% "normal" for industrialised county[2] and some anxiety was recently expressed when the UK level fell from 90 to 85%.[3] It can be seen from the diagrams if, that spare capacity will be very high in the early seventies, even assuming that the present 'boom' in demand continues.

(ii) prices are very high by international standards. In 1962 ICAITI[4] argued that Central American prices (at current market rates of exchange) were above the level of other developed and developing countries, e.g. in Central America the average market price per bag of 44.5 kilos in the capital cities was $1.56 ranging from 1.93 to 1.2:

Central America (ave.)	1.56	Manila	1.14	
Mexico City	.88	Buenes Aires	1.4)	two of the highest in Latin America.
Tokyo	.78	Caracas	1.36)	
Bonn	.80			

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1. It is also difficult to calculate: (i) Capacity is defined in terms of 24 hour operations, but may be shut down for short periods. (ii) Expansion does not take place precisely on Jan. 1st and cannot be credited wholely to one year or another. (iii) Some spare capacity may be necessary for engineering reasons or as a contingency for peak demands if the annual demand pattern is irregular.

2. United Nations (ECAFE) "Industrial Development in Asia and in the Far East" Vol. 4 UN 66 II B22, p.354.

3. The Economist, Nov. 15, 1969. (Prices and Incomes Board Report).

4. Instituto Centroamericano de Investigacion y Technologia Industrial "Informe Sobre La Industria de Materiales para la Construction en Centroamericana". Tomo I 1963. p.147.

In the last few years local prices have fallen somewhat (the average is now nearer $1.25). By way of contemporary comparison, the UK price (it is a 'basing point' price fixed by central agreement) was $.65 per bag until very recently and a recent study on India suggested a figure of about the same order,[1] averaged throughout the country.

However, the problem of high prices is shared by other small, poor, developing countries as in East Africa[2], where in the E.C.A. sub-region the average price, exfactory, in 1967 was $1.33 per bag, (In 1965, Ethiopia's was $1.75 per bag; Madagascar $1.60; Uganda $1.60; Malawi $1.65;) due to the small scale of operation, and also to the high local cost of packaging, power and fuel.

The high Central American prices could be due to many factors but two stand out as most likely. One is a high burden of fixed costs due to the high capital costs in developing countries, small scale operation and low usage of capacity. The second is monopolistic profits (arising from oligopolistic marketing and pricing policies or else "pure" monopoly protected locally by transport costs). On the other hand one would expect labour costs to be less than in the more industrialised countries. One of the more important subsidiary functions of this exercise will be to explain the high prices. However, there is an initial presupposition that the importance of fixed charges in uneconomic 'national' plants is partly responsible.

Thus, we have an initial hypothesis that the 'national' rather than 'regional' character of the industry is a source of inefficiency and high cost. This will now be elaborated at some length.

Cement Technology:[3]

There are few variants of the process used in producing portland grey

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1. V. Podder: Cement Industry in India (Quoted in A. Manne: "Investment for Capacity Expansion" op. cit.)
2. United Nations ECA "Report on the Cement Industry in East Africa" E/CN/14/INR/80.
3. United Nations "Studies in the Economics of Industry: Cement and Nitrogenous Fertilisers" UN 63/II/B3 pp.1-30. and UN "Industrial Development in the Far East" op.cit. pp.354-365.

cement (portland 1) which is by far the most important product consumed from the industry. Cement is produced in two stages. First, clay materials (gypsum) and limestone are combined in a kiln to produce clinker. This is a weight losing process, i.e. 1.5 tons limestone makes 1 ton cement; and thus plants are almost always 'resource based' - i.e. sited near the quarry. The 'clinker' is then milled to a fine powder for packing. (Often the clinker can be treated as a finished product and transported for milling elsewhere).

The methods of manufacture may broadly be divided into the 'wet' and 'dry' processes. The latter involves fusion of dried materials in the kiln at high temperatures. The former involves no drying and the kiln is fed a slurry. The choice of process will depend on the raw materials (those with high water content should use the wet process), on the costs of fuel and power locally (the wet process uses 20-25% more fuel and 4-8% less power), and on the availability of finance (the investment cost of the wet process can be 10% lower). The wet process has an advantage for developing countries just beginning production in that it is simpler to operate and produce a good quality product, and it is fair to say that the 'wet' process is the typical modern large scale method of production.

The 'dry' process also admits the possibility of a vertical 'shaft' kiln as opposed to the traditional horizontal or rotary kiln technique: this is an old technique that has been updated for use in small size installations. However, until very recently only one out of a hundred plants in Latin America used this process.[1]

The United Nations have argued strongly for the vertical shaft in LDC's and it will doubtless become more common.

The Central American Cement Industry:

There are five plants in C.A., all privately owned. There are also two in Panama at either end of the Panama Canal Zone and with the growing interest

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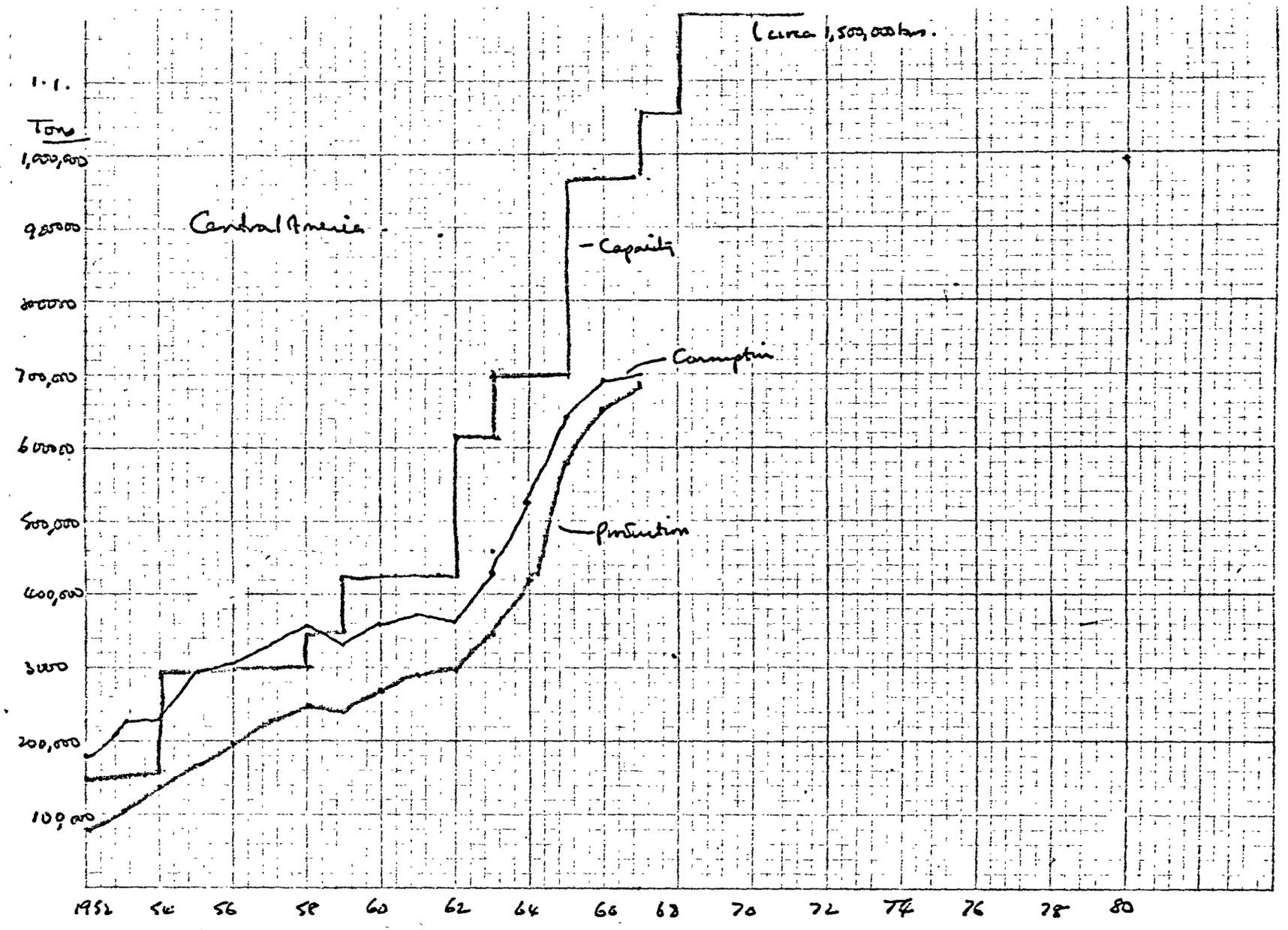
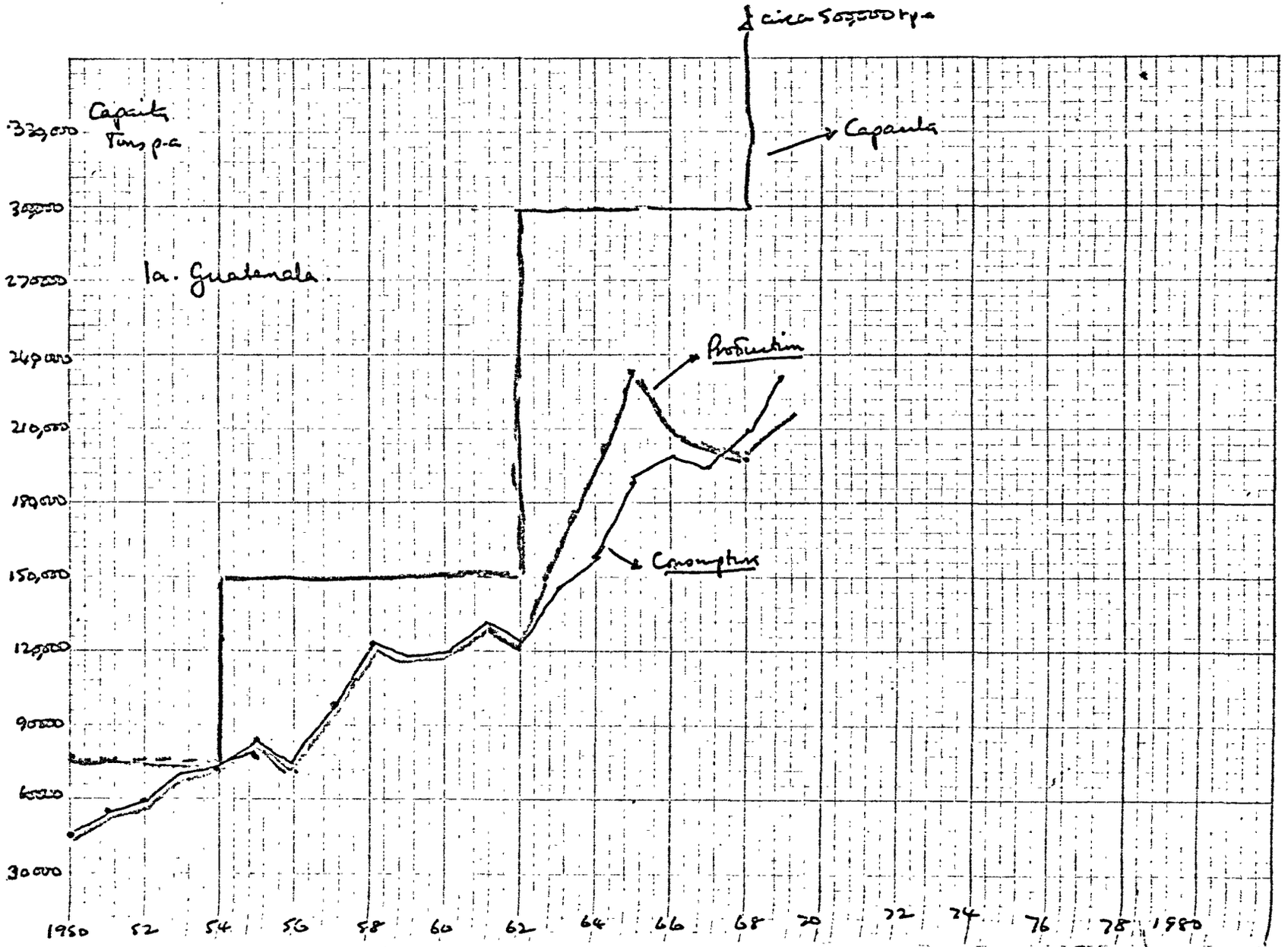
1. Data from Cembureau: World Cement Directory.

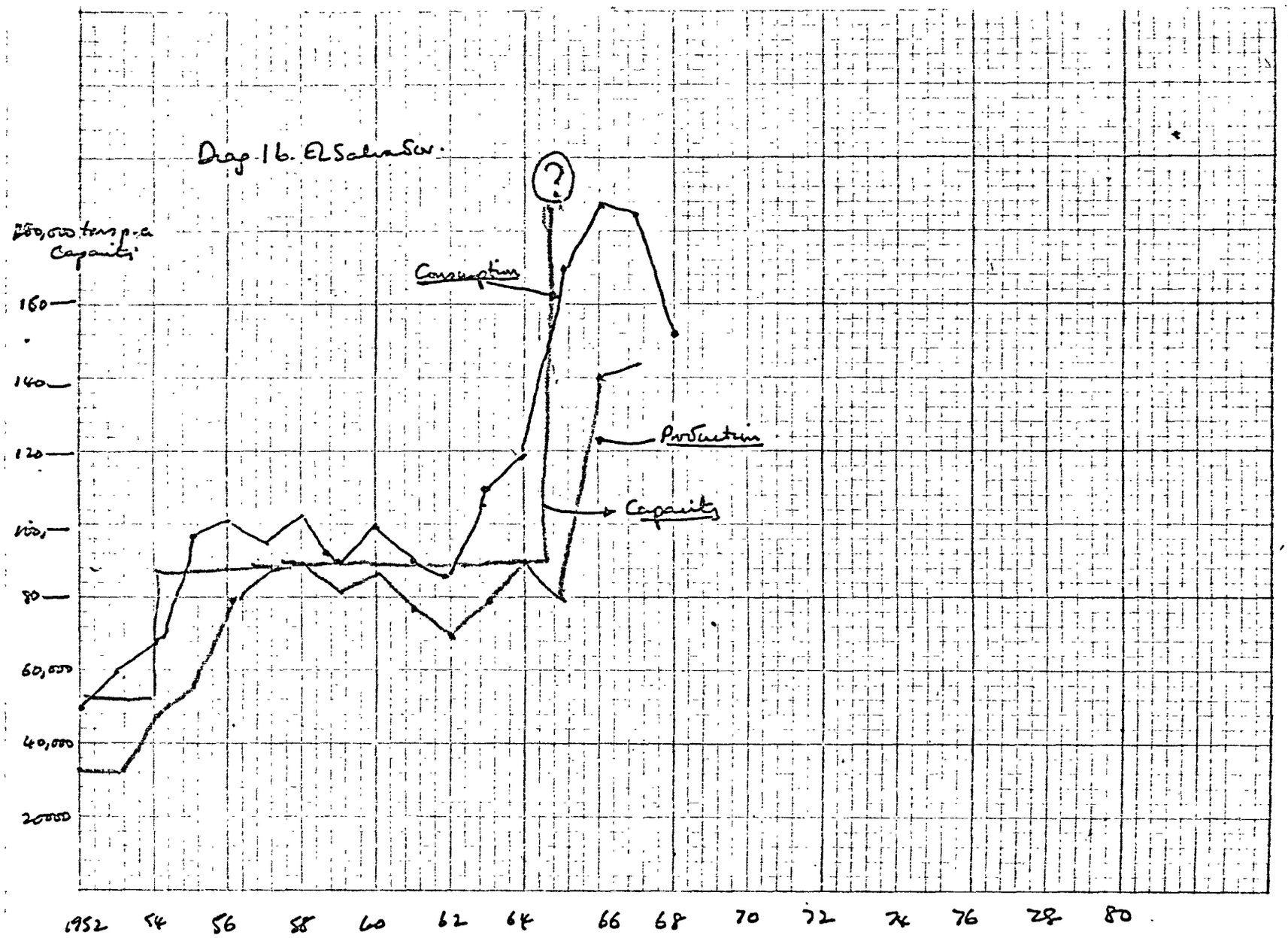
of Colombia in a Central American connection one might mention the close proximity of the big 500,000 tons per annum plant at Barranquilla. However, we shall confine ourselves to those in the five Common Market countries.

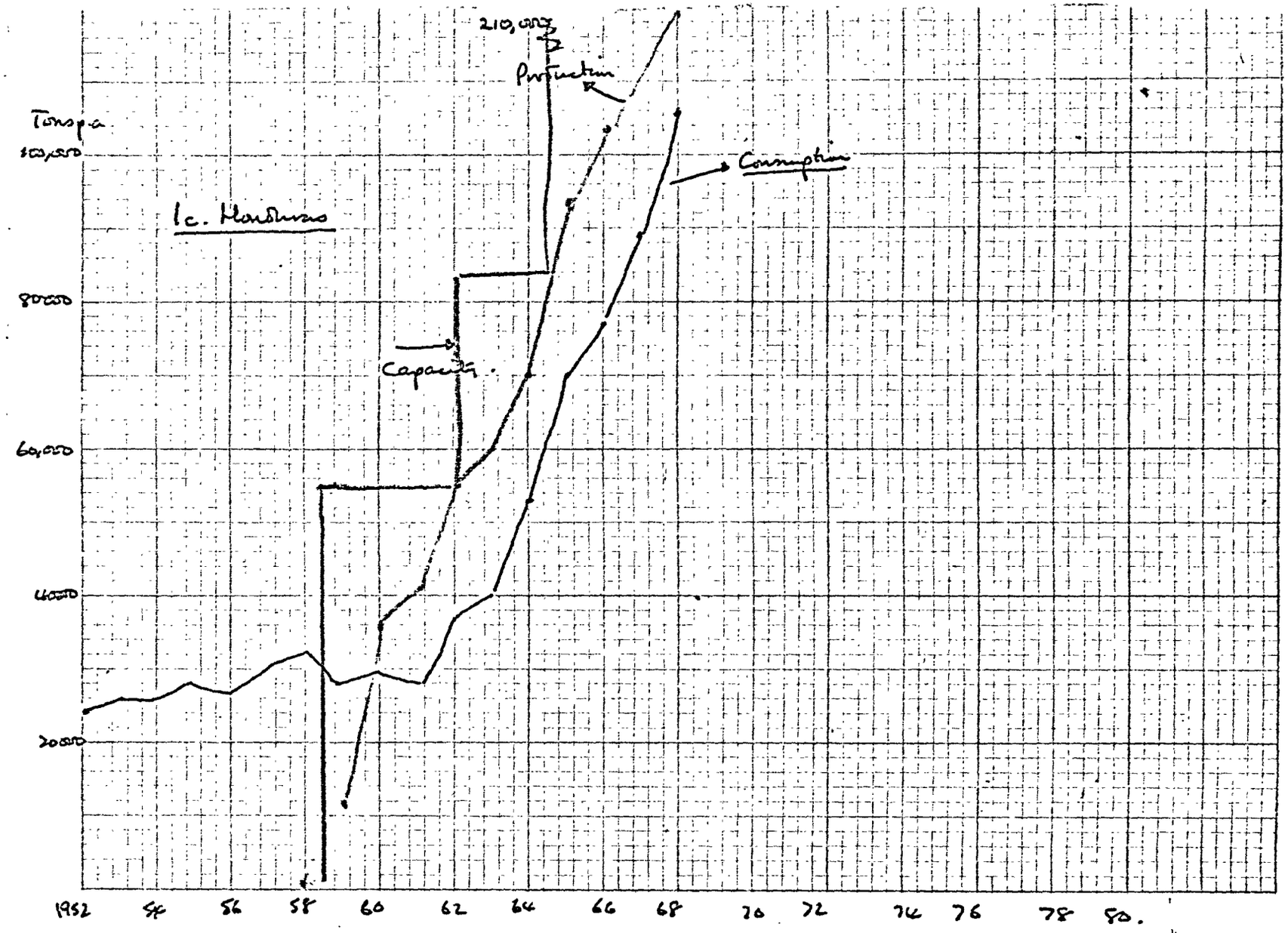
1. Location and Technical Data etc.

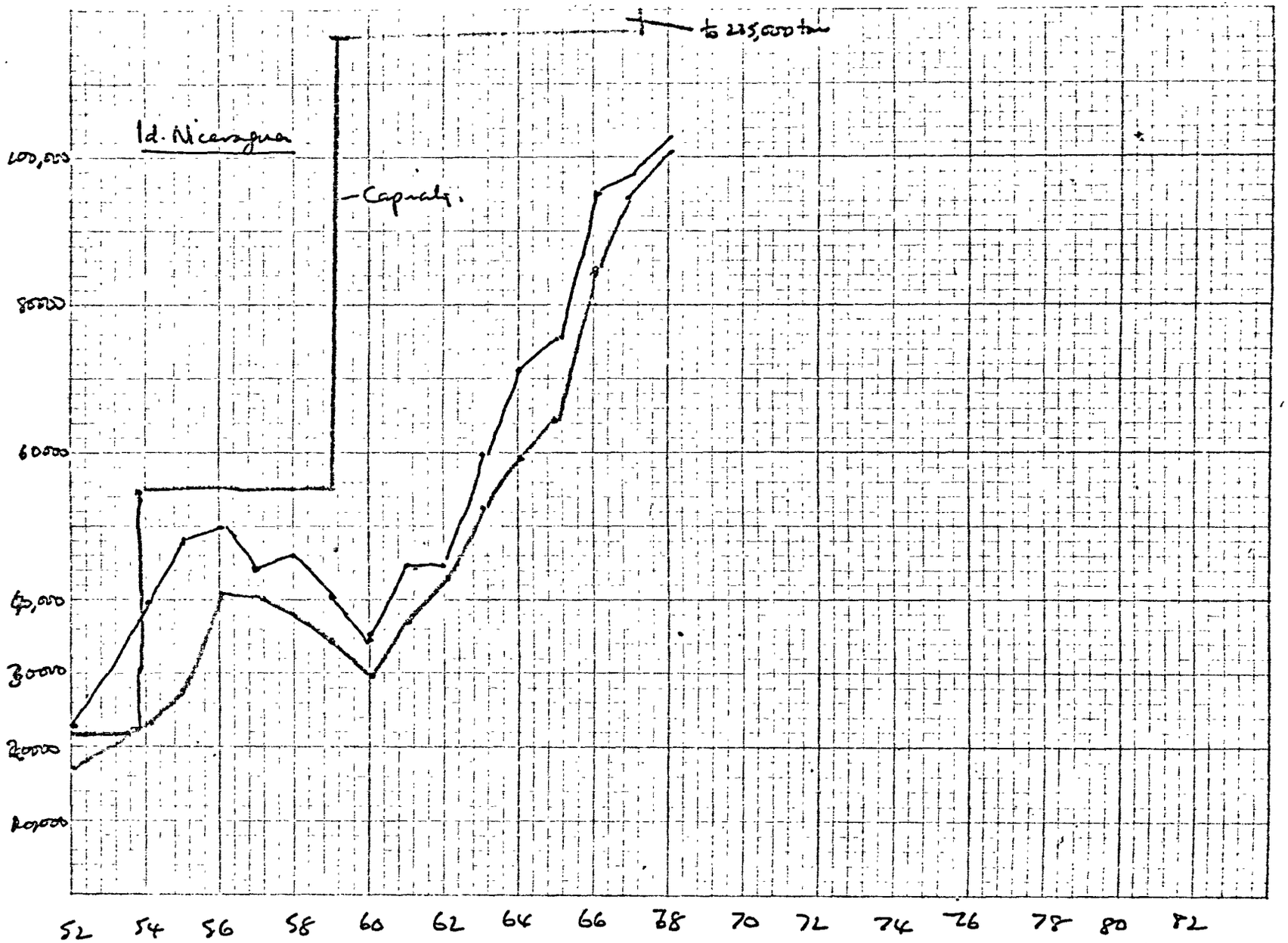
Cementos Novella, S.A. is a long standing company that was producing just outside Guatemala City before the Second War. The plant is of the usual rotary, horizontal type but uses the dry method. Reserves of local limestone are good, very close to the capital and gypsum is brought from El Salvador. The Honduran plant of Cementos de Honduras is in the Cortez province of the North, 30 kms. from San Pedro de Sula (at Rio Bajo), the major industrial centre of the country. This location is suitable for serving the North-west of the country, but connection with the capital, Tegucigalpa, San Salvador and Guatemala is by secondary roads which were, until very recently, of poor quality. (It benefits Ravasar from having local supplies of limestone, clay and gypsum). The process is rotary-horizontal, this time being of the wet variety and the plant dates from 1959. The Nicaragua plant is, again, a wet process establishment of some antiquity (dating from 1941). It is situated 170 kms. from the capital at San Raphael del Sut which involves a short but difficult journey to Managua. The Compania Nacional Productora de Cemento is associated with financial interests close to the President of the Republic, General Somoza, and this, at least partially, explains some of its more idiosyncratic features. The Costa Rican plant, established in 1964, by Industria Nacional de Cemento is the newest in Central America, producing also porcellain and white cement. It is situated 50 kms. from San Jose at Agua Caliete (Cartago Province). The wet process is employed but the new capacity currently being installed incorporates the dry method. The Salvadorian Company (Cemento de El Salvador) has had a change of site since

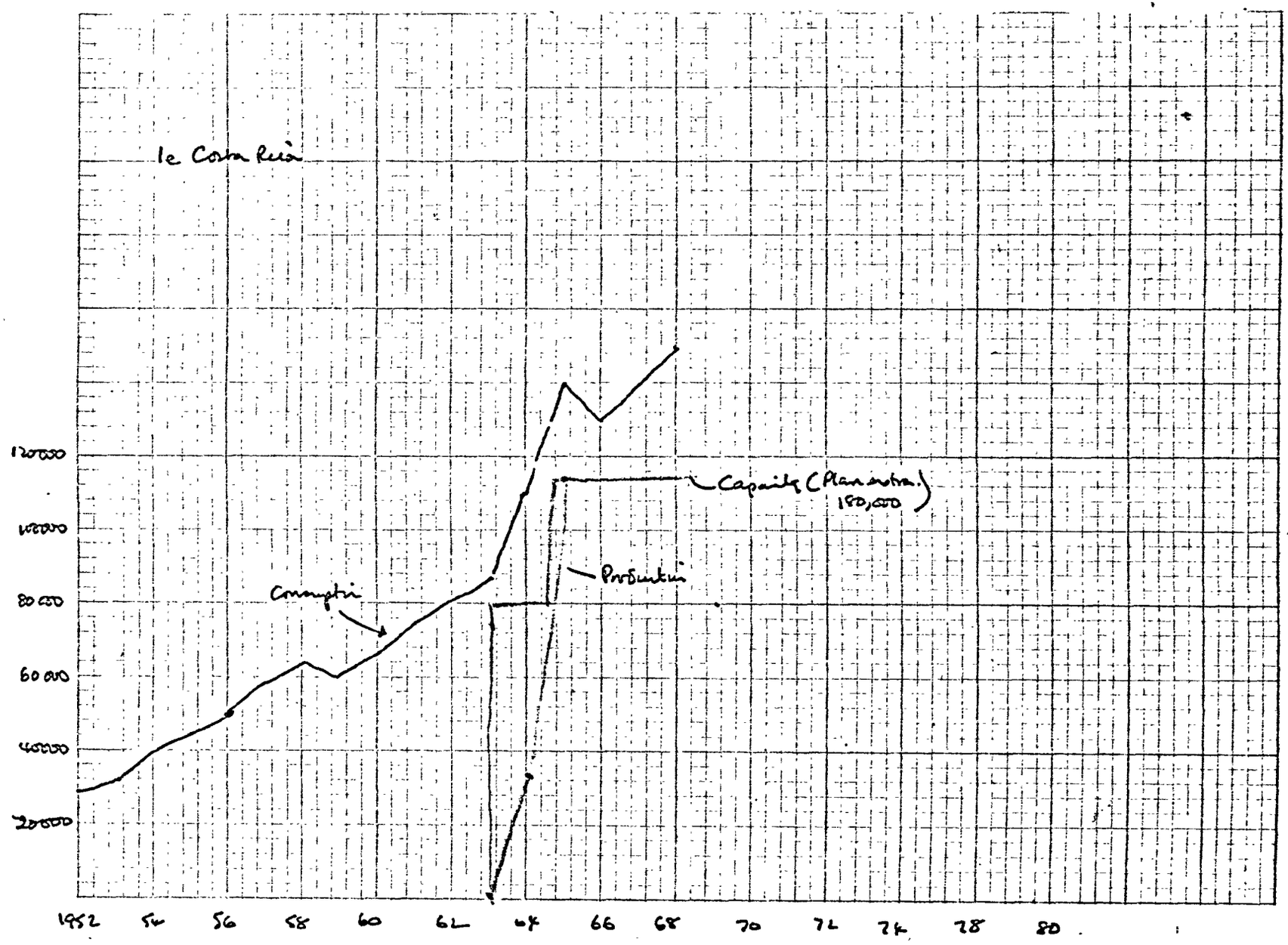

Circa 1,500,000 tons.
I.I.
Tons
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
Central America
Capacity
Consumption
Production
1952
54
56
58
60
62
64
66
68
70
72
74
76
78
80


Capacity Tons p.a
330,000
300000
270000
240,000
210,000
180,000
150,000
120,000
90000
60000
30000
1950
52
54
56
58
60
62
64
66
68
70
72
74
76
78
1980
Ia. Guatemala
circa 50,000 tons
Capacity
Production
Consumption


Diag 16. El Salvador.
?
280,000 tons p.a Capacity
Consumption
Production
Capacity
160
140
120
100
80
60,000
40,000
20000
1952
54
56
58
60
62
64
66
68
70
72
74
76
78
80


Tons p.a.
100,000
80000
60,000
40000
20000
Ic. Honduras
210,000
Production
Consumption
Capacity
1952
54
56
58
60
62
64
66
68
70
72
74
76
78
80.


to 225,000 tons
Id. Nicaragua
Capacity
100,000
80000
60000
40,000
30000
20000
10000
52
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82


le Coca Rica
120000
100000
80 000
60 000
40000
20000
Consumption
Production
Capacity (Planned)
150,000
1952
54
56
58
60
62
64
66
68
70
72
74
78
80

1965 when serious faults developed on the production side, and a new factory was built at Metapan, 125 kms. from the capital near the Guatemala border. It might also be mentioned that the Panama City plant is a new dry (roatry) plant while that at Colon uses the wet process.

2. Production and Capacity

The Guatemala plant consists of four kilns totalling 900 to 1,000 ton/day capacity[1] which for a 300 day year is 270,000 - 300,000 tons p.a. The four kilns are of approximately equal size, expansion taking place in 1956, 1962 and 1966. The relation between production, capacity and demand (apparent consumption) can be seen in diag. 1a. Generally speaking, capacity utilisation has oscillated around 75%, but the situation has been less healthy in the last few years. What is perhaps more surprising is that the company are now planning to double their capacity by another 1,000 T/D by building a new plant at Sonorate on the road to the Atlantic coast. This is based on optimistic assumptions about the derived demand for cement that is likely to be required in the construction of work associated with the major Eximbal nickel extraction project[2], the reconstruction of Champerico port and other anticipated major developments.

The Honduran experience[3] (diag. 1c) has been of an extremely rapid growth of demand both internally and in the main export markets. Thus two expansions of capacity were necessary within five years of the project commencing in July, 1959. Subsequently, a major kiln expansion lifted total capacity to 210,000

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1. Capacity is usually defined in terms of the kiln size but the clinker mill, a railway siding etc. could in theory be the constraint on further output. 1000 T/D was the figure given by the manager and is presumably about right. Sometimes it is assumed that 10% capacity should be left idle for safety reasons and not be included in the overall figure; this practice is not followed here. Note also that references to 'capacity utilisation' may be ambiguous if there are large fluctuations in demand during the year: peaks not met yet by production would have to be catered for by extra storage.
2. "Plan Desarrolo de Guatemala 1969-72. Part II" pp.62-63.
3. The Honduran cement industry is discussed in some detail in "La Vivienda en Honduras" (Housing in Honduras) Pan American Union, 1964, pp.140-150.

tons, which is almost twice the present level of production. The present three kiln plant should suffice for some time, but there has been periodic discussion of the need for a new plant in the South. Perhaps the present improvement in the S.P.S. - Tegucigalpa road will bind the presently divided Honduran economy close together and San Pedro Sula will retain its monopoly position.

Nicaragua, for some reason, has consistently installed capacity well ahead of production required and over the whole history of the present four kilns, there has been frequently a utilisation rate of 40-50%.

Costa Rica, the newest producer had installed a 350 T/D kiln in 1961 which has been run at full capacity over the last five years. The capacity quoted by the firm is 115,000 tons, which implies an annual working of 330 days. Various changes have been made to enable the plant to operate at a particularly high level of efficiency. A new kiln with a capacity of about 250,000 tons per annum is to be installed.

The pre-1965 Salvadorian plant consisted of two kilns which operated close to full capacity (90,000 tons per annum). Little is known about the present plant but it is believed to have a 150,000 tons per annum capacity which is approximately the level of present (1968) output.

Diag. 2

Apparent Consumption of Cement in Central America

	GUATEMALA			EL SALVADOR		
	Production	Exports	Imports	Production	Exports	Imports
1950	46,000					
1951	57,000					
1952	59,000					
1953	67,000			29,000		32,000
1954	68,000			50,000		18,000
1955	78,000			56,000		40,000
1956	72,000			80,000		20,000
1957	96,000			88,000		7,000
1958	122,000			90,000		12,000
1959	116,000			82,000		8,000
1960	119,000			85,000		14,000
1961	129,000			74,000		18,000
1962,	124,000	2,000		65,000		20,000
1963	160,000	12,000		79,000	4,000	27,000
1964	190,000	24,000		90,000	9,000	37,000
1965	231,000	36,000		80,000	3,000	87,000
1966	201,000	9,000		142,000	4,000	40,000
1967	196,000	8,000		151,000	13,000	37,000
1968	192,000	13,000	32,000	159,000	46,000	40,000
1969	212,000					

Notes

1. Production figures from Direction General de Estadistico. Printed by SIECA ("Quinto Compendio de Estadistico") 1968.

2. Pre-1956 figures (indices) given in "Guatemala en Cifras".

3. Export/Import Data: SIECA 1962-68. "Annuario Estadistico de Comercio Exterior". 1959-62 from ICAITI (Study of Construction Industry).

Notes

1. Production figures from "Quarto Compendio de Estadistico" (1952-57) and Quinto Compendio etc. (1957-67). Confirmed by "Indicatores de C.B. de El Salvador".

2. Trade Figures from SIECA and national trade statistics.

(Rounded to nearest 10,000 tons)

	HONDURAS			NICARAGUA		
	Production	Exports	Imports	Production	Exports	Imports
1950	-					
1951	-					
1952	-		23,000	17,500		8,000
1953	-		25,000			
1954	-		25,000	23,000		17,000
1955	-		28,000	28,000		19,000
1956	-		27,500	42,000		8,000
1957	-		31,000	42,000		2,000
1958	-		32,000	40,000		5,000
1959	11,000		17,000	35,500		4,500
1960	37,000	10,000	1,500	31,500		3,500
1961	42,000	12,200		40,000		5,000
1962	55,500	17,000		45,000		
1963	60,000	18,000		55,000		4,000
1964	70,000	17,000		59,000		12,000
1965	94,000	24,000		65,000		10,000
1966	104,000	28,000		85,000		10,000
1967	111,000	29,000	7,000	96,000		2,000
1968	123,500	28,000	9,000	102,000		2,000
1969				107,000		

Notes

1. Production data from SIECA and Compendio Estadistico: Honduras, Direction General de Estadio

2. Imports and exports; ICAITI; SIECA; national data.

Notes

1. Production data from firm: pre-1959; "Bulletin. Estadistico", Nicaragua.

2. Trade - National trade statistics; SIECA, etc.

COSTA RICA

	Imports	Exports	Production
1950			
1951			
1952	31,000		
1953	32,000		
1954	40,000		
1955	45,000		
1956	50,000		
1957	58,000		
1958	65,000		
1959	60,000		
1960	66,000		
1961	74,000		
1962	81,000		
1963	87,000		
1964	78,000		33,000
1965	25,000		116,000
1966	7,000		116,000
1967	2,500		116,000
1968	2,000		

Notes

1. Data on Trade from ICAITI/SIECA and the "Annual Annuario Comrerico Exterior de Costa Rica".

2. Date on Production from the plant.

What stands out quite clearly is that the present capacity expansion plans in Costa Rica take no account of spare capacity in Nicaragua; and Guatemala's proposed expansion is being undertaken independently of the situation in Honduras (and El Salvador).

3. Consumption Trends

(A) Consumption trends in Central America can be seen from diags. 1 & 2 a-f (based on "apparent consumption", i.e. production + imports - exports).

There has been a gradual, at first sight, an exponential increase in demand since 1950 disturbed by three main cyclical movements. First, the "boom" in construction in the early and mid-fifties lasted until approximately 1959, and was particularly significant in El Salvador and Nicaragua; second, there was a levelling off - in some cases, a fall in demand - in the period 1959-62; and thirdly, a more recent "boom" in construction until the present time, though this has tapered off in the last three years. Cyclical disturbances are less pronounced in Guatemala and Costa Rica. This is probably explained by the fact that, at least by Central American standards, they are the two more diversified and stable economies.

Demand projections were made first of all in the basis of a semilog time curve to establish the rate of growth of demand over the period 1953-1966.

		R	% geometric increase p.a.
Guatemala:	$\log C = 4.7491 + .03505t$ (.0018)	.9786	8.4
El Salvador:	$\log C = 4.8034 + .02456t$ (.0042)	.8301	5.8
Honduras :	$\log C = 4.2410 + .03867t$ (.00455)	.9098	9.3
Nicaragua:	$\log C = 4.4424 + .03313t$ (.00349)	.9259	7.9
Costa Rica:	$\log C = 4.4644 + .04249t$ (.00199)	.9839	10.8

(B) It was felt that it would be more satisfactory to try to establish a functional relationship between cement consumption and the activity level of the construction sector. A linear correlation was desired between the rate of growth of cement consumption and the rate of growth of the construction component of GDP. This is not a very satisfactory exercise in practice, as national income statistics in Central America are unreliable in general, and particularly unreliable for the fragmented private building sector.[1] Also, there were serious problems of reducing sectoral figures to constant prices with only general price indices: the two countries with the most serious inflation did not have any other than 'current price' estimates of construction GDP (Costa Rica and Honduras).

However, for what they are worth the following relationship were established for two countries (Guatemala gave a negative correlation coefficient).

El Salvador $\log C = -1.52 + .8545 \log GDPc \quad (R^2 = .779)$

Nicaragua $\log C = -3.1328 + .9888 \log GDPc \quad (R^2 = .9531)$

(Both use data at constant prices; 1962 prices for El Salvador over range 1953-1967; 1958 prices for Nicaragua).

In both cases, cement demand is growing more slowly than the sectoral growth rate However, because of statistical deficiencies, this approach was not pursued further.

(C) Finally, it was felt useful to try and establish a relationship between per capita consumption of cement and income per capita on an X-section basis. So a sample of 19 Latin American countries was taken for 1966 and a correlation made:[2]

$$\log \frac{\text{consumption}}{\text{per capita}} = 1.3827 + 1.2989 \log \frac{\text{inc}}{\text{per capita}} \quad (R^2 = .9012)$$

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1. An example of this is the enormous discrepancy (up to 50%) between estimates of construction GDP by the Planning Office (OFIPLAN) and by the Central Bank in Costa Rica - see Table 5-A-4 "Evaluation of Costa Rica's Economic & Social Development Plan 1965-68". (Plan American Union).

2. The data for consumption and National Income (converted to dollars at the official rate of exchange) were obtained from Pan American Union statistics. In some cases 1966 figures were not available and 1965/64 figures were made to suffice (though consumption -income statistics were consistent on a year for year basis.)

Were there to be a "normal" relationship then the following consumption levels would be predicted:-

	'normal'	'actual'
Guatemala	63.6kg. per cap.	43.5
El Salvador	50.3 " " "	60.1
Honduras	40.3 " " "	31.8
Nicaragua	65.8 " " "	56.8
Costa Rica	87.5 " " "	88.0

Several features of this X-section are interesting. The income coefficient is about 1.3 ∴ demand for cement is expected to grow at 30% faster than the income level of the region if X-section figures can be used for projection purposes. The other point is that Central America generally 'under-consumes' cement given its income per head. Even the countries that are over or at projected levels, were, at that time, at the peak of "boom" periods. However, it is possible that the income elasticity of demand is lower for smaller and poorer countries in the sample and, again, because of the statistical material, which for a one-year X-section is dubious, not too much weight was placed on those findings.

In diag. 3 a projection from the first simple model is set alongside the official projections made in the early 1960's. It can be seen that early industry projections were far too low. This, if nothing else, demonstrates the hazards of projecting demand for an unstable industry: in all the national cases the trend being artificially deflated by the dominant influence of the 1958-62 "depression" which also served as a base for the projections made at that time.

(D) Cement Consumers:

There is not a great deal of information available on the use of finished cement by sector. However, the Annual 'Annuario Estadistico' of El Salvador does give some information on the usage of primary inputs and from the 1968 edition the following input-output relations were established (by weight - tons);

Diag. 3

Projections of Demand (Tons)

	1970	1
Guatemala		
ICAITI (Study in 1961/2	185,000 to (over 215,000 200,000)	250,000
Joint Transport Study (1963)	230,000	295,000
CABEI/Joint Planning Mission (1962)	240,000	300,000
(Time series (1953-68)	270,000	380,000)
El Salvador		
ICAITI	110,000 to 120,000	(160,000)
J.T.S.	170,000	220,000
(Time Series	205,000	280,000)
Honduras		
ICAITI	(60-70,000)	(80,000)
J.T.S.	62,500	90,000
(Time Series	80,000	110,000)
Nicaragua		
ICAITI	(90-110,000)	(130,000)
J.T.S.	80,000	110,000
(Time Series	105,000	150,000)
Costa Rica		
ICAITI	90-150,000)	(200,000)
J.T.S.	150,000	178,000
(Time Series	175,000	265,000)

Produced / Consumed by — In Metric Tons	Asbestos Cement Products	Marble works tubes & pipes	Cement & concrete	Blocks & Posts	House & Building contractors	Road Bridges contractors	Rest
Local Production of Cement	5,150	600	3,535	6,950	23,750	860	131,000
Imports → C. America	10	-	360	-	-	-	37,500
Imports → Overseas	-	-	1,710	800	-	415	39,500

It can be seen that the 'cement products' industry is of almost trivial importance by comparison with other cement users taking about 12% of the total and so the linkages from a local cement industry cannot be considered very large. What is also interesting is that even building contractors are small consumers by comparison with "the rest" which comprises small private sales (possibly to small contractors via retailers) and sales direct to government.

In terms of the importance of cement inputs to the value of production in these various industries, the following input-output ratios can be established, for the value of cement inputs as a % of final production.

Asbestos Cement Products	.12
Marble Works	.097
Concrete Tubes & Pipes	.29
Blocks, Posts etc.	.18

However, it should be stressed that these are very much more labour intensive industries than cement production itself, and one could infer that the employment effect of having these industries is correspondingly quite large. However, it would not be correct to assume that the absence of a cement industry is in any way connected with the absence/size of a cement products industry: in 1962 Costa Rica had (in terms of men employed) the largest products industry in Central America but no cement plant.[1]

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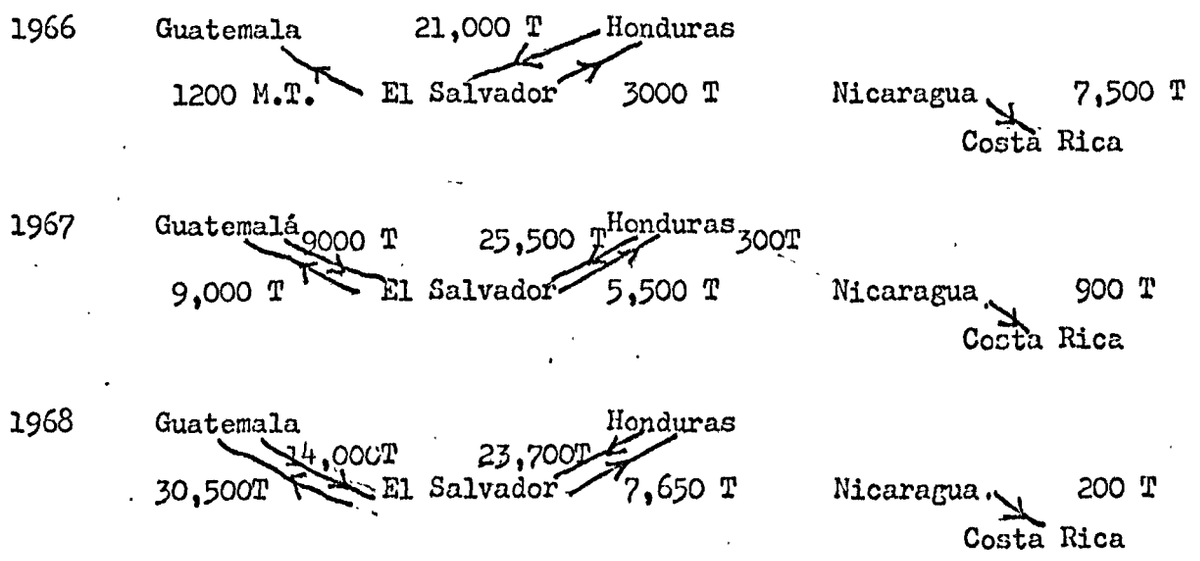
1. "Informe sobre la Industrias de Materiales para la Construccion en Centroamerica" op.cit. Tomo 1. Cuarto II, 3, 5.

(E) Consumption and Trade

From diag 4 it can be seen that there are two main trends taking place in the role of international trade. First, regional import substitution has been pursued almost to completion. The remaining 1% or so of demand unsatisfied by local production could well be accounted for by specialised cement products- porcellain cement etc. The second discernible trend is the growth of intraregional trade. This is still not too important - the highest % of regional demand was 12% of consumption in 1965 - and the average over the last few years has been between 5-10% of regional demand. The main trade flows can be seen below for 1966-68.



The trade which exists is almost entirely confined to the Northern triumvirate (as indeed is most of the Common Market's activity).[1]

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1. However, one feature is distinctly odd; the existence of two-way trade in a homogeneous product, even in conditions where there has been no problem of domestic capacity shortage. The Honduras/Salvador trade is easier to explain. Salvador supplies the remote regions of the south of Honduras (very small sums anyway - less than 5% of the Honduran total), while Honduras exports to San Salvador along the main highway from San Pedro Sula ("the El Amatillo gateway"). It appears that the Honduran producers found the Salvadorian market more stable, organised and offering better prices (even with transport cost) than their own. The practice of Guatemala importing growing quantities from El Salvador while continuing to export growing quantities is more difficult to explain perhaps in terms of seasonal capacity bottlenecks in both countries occurring out of phase or else border trade.

Diag. 4

International Trade in Cement

	(1)	(2)	(3)	(4)
1955	4,000	158,000	130,000	56%
1956	3,700	135,000	105,000	66
1957	3,300	125,000	105,000	66
1958	5,900	205,000	105,000	70
1959	9,700	317,000	100,000	67
1960	12,000	326,000	90,000	74
1961	20,000	720,000	95,000	74
1962	26,000	934,000	87,000	78
1963	43,800	1,443,000	94,000	81
1964	56,500	1,566,000	84,200	83
1965	80,000	2,380,000	50,000	90
1966	44,200	1,320,000	18,000	98
1967	50,600	1,568,000	9,438	99
1968	76,224	2,213,000	9,160	99

Col. (1) Weight (MT) of products traded intraregionally.

(2) Value ($) of products traded intraregionally.

(3) Weight of products imported from outside the region.

(4) % of apparent consumption satisfied within the region.

Statistics from SIECA Annual yearbooks of external trade.

4. Cement Prices

We have already said that Central American cement prices are high by world standards. However, pricing is complex. There is price discrimination e.g. governments v. private consumers. Also, Honduras sells to Salvador at $1.15 per bag (cif. Salvador 1965), but its official exfactory price at the same time was $1.35 per bag. Guatemala has a different price for bulk purchase ($1.15 per bag) from individual small bag sales ($1.25 per bag). In other cases, conflicting figures are given by government and industry (e.g. Costa Rica or Nicaragua) as to the exfactory price. In some cases this could have been due to misunderstanding; the lower figures in each case is taken as the exfactory, the higher as the capital city price. Consumer taxes confuse the issue too at a retail level. The conflicting data is set out in diagram 5.

The following are taken as contemporary average exfactory prices;

Guatemala	$1.2 per bag
El Salvador	$1.25 per bag
Honduras	$1.55 " "
Nicaragua	$1.55 " "
Costa Rica	$ .8 " "

Diagram 5

Ex-Factory Cement Prices in Central America

Prices in ¢ per 42.5 kilo bag	1959/62	1963/4	1966	1968	1969/70
Guatemala	1.25(1) (retail)	.9 (10) 1.35(2)	1.3 (3) (retail)	1.3(3) (retail)	1.25)(3) 1.2) 1.15)
El Salvador	1.25(1) (retail)	1.25(2) (retail-San Salvador)	1.45(4) (retail) 1.35	1.5(4) (retail) 1.35	1.41(4) (retail) 1.10
Honduras	1.45(1) (retail)	1.61(9)	1.4(5)	1.3(5)	1.24(5)
Nicaragua	1.95(1) (retail)	1.95(2) (retail - Managua)	1.57(6) 1.65(7)	1.54(6) 1.65(7)	1.54(6) 1.65(7)
Costa Rica				.8(8)	.8(8)

Notes

1. These figures are obtained from the ICAITI study on the construction industry. Investigators obtained data from governments and were not clear whether retail or wholesale or exfactory prices were being given. It does appear that the prices given are generally retail prices.

2. Joint Transportation Study Pt. I, p.188.

3. 1966 and later cement prices for Guatemala given in "Numeros indices de precios de la republica de Guatemala" (indices show prices unchanged since 1960) and Bulletin Estadistico de Guatemala, 1969/70 data from the firm.

4. Obtained from Bulletin Estadistico, El Salvador: Vol. 70-71-72.

5. Data from plant management (August, 1969). There are also exports to Salvador at cif. Salvador, ¢1.14 per bag, 1966.

6. Data from company (interview 1969).

7. " " " (questionnaire 1970)

8. Data from Ministry of Industry in San Jose, 1969. ¢.8 seems reliable; 7.6c is transport to San Jose.

9. "Vivienda en Honduras" gives an estimated exfactory price for 1963.

10. Figure from Industrial Census.

It is also significant that prices have also dropped appreciably in recent years. The effect of increased scale may have been to lower the cost - it may be also that in recent years there has been some price competition between Salvador, Guatemala and Honduras, as each company strives to increase its share of the market.

Extra-regional imports are no longer of any importance in Central America and it would be misleading to quote recent import prices as they probably refer to specialised cement products. Imports from outside Central America have been negligible except for Costa Rica (before 1965) Honduras (before 1959) and, very occasionally, El Salvador and Nicaragua in small quantities. The following gives some idea of the level and degree of fluctuation of prices of bulk imports of several thousand tons (figures - M.T. at $ per ton) - data taken from Central American import statistics.

Diagram 6

	1962	1963	1964	1965	1966
Guatemala	-	-	-	-	-
El Salvador	$34 ave	$32 ave.	(11,900 at $22.7) (Germany) (5,300 at $33) (Panama)		4,300 at $23.5
Honduras	-	-	-	-	-
Nicaragua	-	-	(5,000 at $23) (W. Germany)	-	-
Costa Rica	$21 ave.	$19.5ave.	8,500 at $14.5 (Japan) 15,000 at $23 (Germany) 21,000 at $21 (Venezuela) 23,000 at $20.5 (Colombia)	7,800 at $19.5 (Colombia) 15,400 at $29 (Japan)	1,600 at $19.5 (Colombia) 4,000 at $37.5 (Japan)

Of the two big bulk importers, Costa Rica has traditionally been able to get cement from overseas at about $20 per ton ($.9 per bag or 6 colones). This, however, excludes tariff, part handling charges, and railway costs from ports which probably add up to $12 per ton. (This tallies with estimates of cement retailing in Central Costa Rica at about 9-10 colones per bag before 1965). As the present exfactory price is under 6 colones, Costa Rica has clearly no need of protection, and the present Common Tariff of $10 per ton plus 10%* is quite redundant: (it works out at an ad. valorum equivalent of 50% on a shipment of $25 per MT). The other countries have always been protected at this high rate and except for Salvador, in small quantities, they have never seriously resorted to importation.

One further feature of note is that for some suppliers with a regular trade to the area there are stable prices over time: Colombia sells consistently at $20 per ton; West Germany $23 per ton cif. Central American ports. This compares with exfactory Central American prices of Guatemala $27; El Salvador $24; Honduras $28; Nicaragua $34 and Costa Rica $18 per ton. With port handling charges of - on average - about $5 per ton, and rail charges to the main centres of consumption, about $2 per ton, it is fairly clear that transportation costs without a tariff are an effective protection of a high cost industry in all cases except Nicaragua. However, a 50% tariff is excessive even for that industry and partly for this reason Nicaragua has been able to impose a consumption tax of 15% in recent years.

5. Cement Costs

While it is not possible to give a satisfactory analysis of the breakdown of costs without comprehensive data there is a good deal of indirect

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* Prior to 1964, Costa Rica had a different rate from the others. As a major importer its tariff was only $4 per ton; about 15% on a $25 per MT shipment.

evidence and fragmentary pieces of data which can give a fairly accurate profile of variations in costs of the main inputs. The information available is set out in Diagram 7. There are some approximations and in several cases less sophisticated methods were applied: the 'missing' figure was assumed to be the 'average' of those of the other countries. With the cost of packing, a minor cost, the figure was simply based on the costs of the one country which had data.

One must also say at the outset that one would expect considerable fluctuations in cost due simply to the local situation regarding the quality of quarry and limestone.

As far as proportional costs are concerned there is a general uniformity in cost levels in all cases except that of raw material and packing costs in Guatemala (1958); this is despite the existence of substantial spare capacity in some cases and differences in age and location of the plants. Only in the case of packing costs and working capital charges is there insufficient data to come to any reasonably firm conclusions.

Labour costs vary somewhat but of the four estimates taken in the last few years, there is only a small dispersion about the $2.5-$3.5 per ton range. However, it is believed that the labour force does not greatly increase in size, if at all, as capacity is utilised more fully and, thus, the cost per ton will fall in Honduras and Nicaragua as the plant approaches full capacity.

Depreciation and related costs are high for those plants where there is substantial underutilisation of capacity, namely Honduras and Nicaragua. These values depend initially upon the assumptions, particularly as regards the rate of depreciation. 8% (On a straight line basis) was the figure quoted by several accountants.

Diagram 7 Cost of Cement Production ($ per Ton)

	Guatemala		El Salvador		Honduras	Nicaragua	Costa Rica
	A (1968)	B (1970)	C (1961)	D (1968)	E (1969)	F (1969)	G (1970)
Proportional Costs (per unit of output)							
1. Limestone) raw material			2.8	1.8 to 2	1	(2)	1.7
Gypsum	.9		.8				
2. Packing	2.2		1.4	2 to 4.5	(1.5)	(1.5)	
3. Power	2.4	1.5	2.3	2.2	2.5	2.6	1.5
4. Fuel	4.7	2.8		2.75	(4.5)	3.5	3
	18.3		(10-12)	10-12	(10-12)	(10-12)	
6. Labour Costs per unit of output- workers - overhead & staff	4.6		5.0	2.8	3.75	3.35	2.5
Investment-related Costs							
7. Depreciation at 8% of fixed investment.	4	3.8	3.2	?	7.6	8.8	(4)
8. Spare Parts at 2%)	1.5	(1.4)	1.0	?	(2.8)	(3.3)	(1.5)
9. Repairs 1%)							
In $ per ton capacity							
Total Est. Costs incl. working capital	(20.5)	(20)	(18-20)	?	(24)	(26)	(14)
Exfactory Price	32.7	26	29	(23-25)	30	36	20

NOTES:

A. Information from 1958 Industrial Census when output was 120,000 T and capacity 150,000 T. Fixed Investment in this year was $6m. Staff - 400 men. Electricity: 1.65 cents per KWh per ton. Working capital charges at 5% of "circulating capital".

B. Data obtained from the company: (1970) output was 210,000 T and capacity 320,000 T. Fixed investment $10m.
Electricity cost is 1.1c per KWh. Fuel oil is $2.82 per barrel (1 barrel per ton of cement).

C. Data obtained from the 1961 Census: output was 75,000 T and capacity 90,000 T. Fixed investment $3.8m. Staff 240 people. Electricity cost is 1.65c per KWh at 140 KWh per ton.

D. Data from 1967/68 Annuario Estadistico (Vol. III) 'Industria, Commercio y Servicios'. Output was 170,000 T. Staff 275 employees. Electricity costs are 2.20c per KWh for 100 KWh per ton.

E. Data is obtained from the firm: capacity in 1968, 210,000 T; output is 105,000T. Fixed investment is $10m. Electricity costs are 1.8c per KWh for 140 KWh per ton. Labour costs were obtained indirectly from the 1966 census:

. Raw material costs were obtained from "Evolution de desarrollo de la Mineria de Honduras". Ministry of Natural Resources 1970.

F. Data obtained from the firm (1969): production is 105,000 T and capacity 235,000 T. Fixed investment is $11.6m. Staff, 240 workers (ave. cost $1,500). Electricity costs are 3c per KWh for 86 KWh per ton.

G. Data obtained from the firm: production & capacity are 115,000 T. Fixed investment is $6-7m. Staff is 200 men. Labour and Raw Materials cost as a % of total cost from "Annuario Estadistico" 1968. Electricity (ave. of night and day; 1.5 KWh for 110 KWh per ton).

In view of the difficulties of assessing some of the costs it is very difficult to give a reasonable idea of the likely pretax profit margins, but given this qualification, it is possible to obtain rough orders of magnitude:

(i) Guatemala 1958: if the extremely high figure for raw material and packing charges is accepted then there would seem to be a rate of return on capital of 8-10%: with an interest rate of about 6-7% and a gearing ratio of1:1 this would give a return on equity of 11-12%. While this seems eminently reasonable it is probably a considerable understatement - with some of the profit element being included in the raw material charge.

(ii) El Salvador 1961: there appears (on the data provided) to be a very large rate of return - about 24% on capital ∴almost 40% or equity assuming the gearing ratio above. While this seems too high it is not clear which costs are underestimated: most are, in fact, drawn from the census.

(iii) Honduras 1969: there appears here to be a low return on capital (less than or approx. 8%) which gives a return on equity of about the same order. This would appear to square with the low rate of utilisation and the eagerness of the company to sell at below normal prices in foreign markets.

(iv) Nicaragua 1970: despite the extremely high costs and underutilisation of the plant, the rate of return on capital of about 10% (equity 12% approx)[1] is reasonable. This is due to the very high prices charged by the plant.

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1. Balance sheet in 1968 shows - 81 out of 91 million cordobas fixed investment as share capital.

Officials of the Nicaraguan government expressed in confidence to the author their view that profits were probably much higher. When questions were put to the Company the author was shown financial data which purported to demonstrate a rate of return on capital of 12-13% consistently over the years 1967-1970. This squared roughly with his own estimate.

(v) Costa Rica 1970: the firm claimed that ⅓ of its exfactory price was profit which would indicate a rate of return on capital of about 12% - on equity of 16%. This very respectable margin appears to be borne out by the cost data which is available, but government officials believed it to be a significant understatement.

Whatever the validity of these estimates they do show up quite clearly one of the main effects of economies of scale. In addition to the need for greater depreciation provision, in order to ensure a reasonable return on capital (10% would probably be regarded as an absolute minimum in Central America where there is negligible tax), the proportion of the exfactory price which consists of profit and interest will be extremely high if plants are small and/or underutilised.

International Cost Comparison: taking into account the extremely hazardous assumption involved in comparing prices between countries and over time, some attempt was made to see to what extent there is divergence between the relative importance of different costs between the Central American countries and by comparison with American, German and Indian cases (see diag. 8). The following points come out clearly:

(i) Much of the high cost of products can be attributed to low capacity utilisation. This depreciation cost is the only one that is seriously out

of line and if costs are scaled down to what they would be at 90% capacity utilisation level, then depreciation and maintenance costs are not too divergent throughout the small X-section sample.

(ii) even then, investment costs seem somewhat higher than those of Germany and India - approaching those of the US; where highly automated equipment is used.

(iii) electricity and power costs are generally slightly higher, but the difference is not significant.

(iv) labour costs (when scaled down to 90% capacity level and assuming no change in the labour force) come out rather less than in India and Germany, but the crudity of the comparison is such as to discount the importance of that finding.

International comparisons will be clearer if each of the major items of expenditure is examined separately.

(i) Investment Costs

It is difficult to come to any firm conclusions on 'normal' investment costs because of the difficulties in obtaining comparable data. Investment costs refer to an assemblage of costs; plant and quarrying equipment, cost of erection, power plant, land clearance and improvements etc. which will vary according to the technical requirements of the firm, the location or accounting conventions (e.g. whether some costs are capitilised or treated as running costs). For example, in the U.S.A. there is a preference for material handling equipment and quality control devices which are not required in developing countries. In developing countries there is considerably greater or different requirements for land clearance, community development buildings, power plants and transport connections. There is, also, a formidable problem of reconciling international data in national

Diagram 8

Costs per ton of Cement

	U.S.A.[a] 110,000 200,000 T Capacity	India[b] 200,000 T Capacity	Germany[c] 200,000 T Capacity	Costa Rica[d] 115,000 T Capacity (fully used)	El Salvador[e] 90,000 T Capacity (fully used)	Guatemala[f] 320,000 T Capacity (fully used)	Honduras[g] 210,000 50% 90% Utilised Capacity	Nicaragua[h] 235,000 45% 90% Utilised Capacity
Proportional:								
Raw Materials	.67	2	.6	1.7	2.5	?	1.0	2.0
Power	2.1	1.45	1.55	1.65	1.65	1.5	2.5	2.6
Fuel	2.4	2.5	3.5	3.0	2.6	2.8	4.5	3.5
Others (Packing etc.)	-	.5 (50% packed)	1.4 (100% packed)	-	1.4	-	-	-
Labour (Direct & Indirect)	7 & 5.8	2.5	3.0	2.5	2.8	-	3.75 2.0	3.5 1.75
Investment								
- Depreciation	4.9 4.5	2.8	2.8	4	3.2	3.6	7.6 4.0	8.8 4.4
- Spares etc.	- -	1.2	.65 (maintime only)	1.5	1.0	1.4	2.8 1.5	3.3 1.6

(a) Based on data in U.N. "Economics of Industry - Cement" op.cit, p.22; assuming 90% capacity utilisation: fixed investment includes plant & quarry equipment, buildings and storage, land etc.

(b) Indian data from Podder op.cit. (90-100% utilisation of capacity).

(c) German data. U.N. studies; p.21 (wet process).

(d) As in Diag. 7 - (g).

(e) As in Diag. 7-(c)

(f) As in Diag. 7-(b)

(g) As in Diag. 7-(e)

(h) As in Diag. 7-(f).

Table 9

Investment Costs in $m (1963)

Capacity T.p.a.	W. Germany[a]	U.S.A.[b]	India[c]	"Typical" LDC[d]	
				I	II
33,000	1.6				
66,000	2.3			2/2.5	
100,000	3.0	6.5	3.6	3.5/4	4/4.7
200,000	4.8	10.8	6.4	6/7	8.5
300,000			9.0		
400,000	7.6	18.0	10.8	10/12	14
500,000		21.5			
1,000,000		30.0			

Central American fixed investment figures are:

Guatemala:	140,000 T (1962) - $6m.	310,000 T - $10m. (1969)
El Salvador:	90,000 T (1962) = $3m.	
Honduras:	210,000 T (1968) = $10m.	
Nicaragua:	235,000 T (1968) = $11.6m.	
Costa Rica:	115,000 T (1968) = $6m.	

From U.N. "Studies in the Economics of Industry; Cement" etc." op. cit

(a) Dry process: excl. clearing land etc.

(b) Wet process - includes elaborate buildings; covers large amount of quantity control equipment, dust control equipment and electrical machinery

(c) 1963 Prices - United Nations "Industrial Development in Asia and the Far East". op.cit. p.63.

(d) "Minimum costs" for developing countries (I) based on estimates of major companies. (II) based on a sampling of firms in LDC's.

currencies and obtained in different time periods. However, the following table (9) conveys approximate orders of magnitudes (it refers only to "grass-roots" plant costs not to total necessary fixed investment).

The U.S. figures which are the only ones comparable to those in Central America are explained by the considerate complexity of equipment. The Central American investment costs of three of the four plants are of the order of 50% higher than "typical" developing country costs. This is partly explained by the difference between "grass-roots" and total fixed investment, but some of the larger cost is probably explained by ocean and land freight costs to Central American sites and difficulties of erection on remote sites. (this is/not uncommon experience - a plant in an Indonesian case study had an investment cost, twice that of U.S. plant of two thirds the capacity).[1]

As a result of these larger investment cost; depreciation, spare parts and other costs based on fixed investment are proportionately greater.

(ii) Labour Requirements

The UN. study on the cement industry also gave approximate figures for manning in the kinds of situation found in developing countries. Except in the quarrying operation, there is little scope for capital/labour substitution, and the main influence on manning is scale - there being considerable scope for economising on labour with larger capacity.

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1. L.E. Doyle: "Inter-economy comparisons: a case study" (a study of a cement plant in Indonesia) 1966.

Diagram 10

Cement - Labour Needs by Man Years[1]

Capacity	Japan[2]	U.S.A.	"Typical" Underdeveloped Country	Central America
50,000 T	-		70-85	Guatemala: 1962 - 375 people
100,000 T	124	75	110-140	(293 manual) 1968 - 467 "
200,000 T	164	96	140-180	El Salvador: 1962 - 221 "
300,000 T	-		240-300	(110 manual) 1968 - 250 "
400,000 T	248	128	380-360	Honduras: 1962 - 357 "
500,000 T	290	150		(267 manual) inc. asbestos plant. 1968 - 350 "
1,000,000 T	-	150		Nicaragua: 1962 - 263 "
				(230 manual) 1968 - 325 "
				(250 manual)

1. Assuming 2,400 hrs. per man year.

2. Excluding quarry labour.

Source: U.N. "Studies in The Economics of Industry" op.cit.

The Central American countries that provide data indicate an 'above normal' manning of 50-100%. This could be due to the prevalence of old machinery, to the use of labour intensive quarrying techniques or sheer inefficiency. Thus the "cheap" labour of Central America is offset to a substantial extent by lower productivity. This can be seen from the diagram below giving labour costs per ton produced in $. What is significant is that the higher Central American costs are accounted for more by managerial/supervisory staffs rather than labourers' wages.

	Managerial	Labourers	Total
Switzerland[1]	.36	1.46	1.82
Germany[1]	.49	1.96	2.45
U.S.A.[1]	1.0	3.2	4.2
(per ton) Guatemala (1958) cement)	1.3	2.4	4.7
El Salvador (1967/8)			2.8
Honduras (1966)	1.45	2.3	3.75
Nicaragua (1969/70)			3.4
Costa Rica (1970)	1.4	1.1	2.5
Kenya[1] (1968)	(.9 to 2.5)	(.9 to 1.5)	

1. Non-Central American data, reprinted from Hans Reickeld: "The Cement Industry in Kenya" Economic Research & Development Papers: Markerere University (No. 124).

Fuel: Generally speaking fuel requirements are technologically determined: 2 million kilocals for a ton of cement by the 'wet' method and 1.6 million by the 'dry' method.

The absence of coal and natural gas limits the choice of fuel in Central America to fuel oil. The major scope for variation which affects the use of fuel oil is the use of the 'wet' or 'dry' process (the latter consuming 25% more. However, this choice is largely technical determined by the water content of the limestone. The cost of fuel oil in Central America is not greatly in excess of that in other locations though the effect of building local refineries has been to eliminate the possibility of cheap bulk purchases of imported fuel oil.[1] However the differential is not great.

1. CABEI - "Investment Opportunities in the Central American Common Market 1964" pp.36-37. United Nations (ECLA) "Comparative Study of Electricity Tariffs in Central America" E/CN.12/CCE SC5/41 (1964).

Electricity: power requirements normally vary from 100-150 KWh per ton and electric power is an important input cost. Here it is difficult to compare costs as the tariffs of Central American companies are complex, and sometimes determined on a negotiated basis. The cost of electricity in Central America is over 2c per KWh except in Costa Rica; and this is several times the rate for industry in most industrialised countries and even Latin American countries. But many plants have their own power units or bulk negotiated ratios. Average industrial tariffs are:

Guatemala	2.4c per KWh
El Salvador	2.6
Honduras	2.6
Nicaragua	3.0
Costa Rica	2.4 1.4 (two companies)

Application of the Model

So far we have built up a case for showing that much of the high cost and inefficiency of the cement industry is due to the fact that production is based on small national units. Using the model set out in Chapter 5, an attempt will now be made to estimate some of the gains that might be obtained (or might have been obtained) from regionalising production.

The various components of the data are as follows:

A. Demand: demand projections are used, from the previous studies of consumption. We also assume:

(a) demand is purely inelastic

(b) demand in any consumption area is concentrated in discrete points, i.e; the capital city or regional centre.[1]

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1. This assumption is validated by the estimates of demand - by department - given in the Joint Transport Study, pp.219-237.

B. Economies of Scale: the linear approximation to the economies of scale function for investment was derived as follows:

(i) the "typical" developing country relationship was found with "high" and "low" estimates. The UN study in cement[1] referred to an exercise in which the investment cost of various plants were compared X-sectionally on a comparable basis and also engineering estimates were made of likely investment costs in LCD's. The following range of figures was produced which appeared reasonable; producing two curves, one using the upper set of figures, the other using the lower set.[2]

50,000 Tpa	⌀ 2.25 to 2.5 m.
100,000 "	⌀ 3.5 to 4 m.
200,000 "	⌀ 6 to 7 m.
400,000 "	⌀10 to 12 m.
800,000 "	⌀20 to 22 m.

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1. U.N. "Studies in the Economics of Industry" op.cit.

2. These costs include quarrying, basic building and storage facilities, transport costs on imported equipment, installation of equipment and land preparation.

If log capacity is plotted against log fixed investment, then this gives an elasticity factor of .7 approx. These two curves were reduced to linear approximations over the range 0 to 800,000 Tpa. which is the upper limit of the Central American market for 1970.

$I = \$1{,}900{,}000 + 19c$ where C is the capacity in tons per annum

$I = \$2{,}100{,}000 + 19c$ I is the investment cost in $.

Now, the line must be assumed to represent also the economies of scale function of individual Central American plants. However, it is known that in fact, the Central American costs are somewhat higher than these average "grass-roots" cost and so the line is assumed to have the same gradient, but pass through the point represented by the Central American data.[1]

	Capacity	Investment Cost	I.C. at 1960 Prices
Guatemala	325,000	$10 m	$10 m
Honduras	210,000	$10 m	$8.5
Nicaragua	235,000	$11.5m	$10.0
Costa Rica	115,000	$ 6 m	$5.4

Thus the approximations are:

$I = 4.2 m + 19C$
or $4.4 m + 21C$ (Nicaragua)

$I = 2.2 m + 19C$
or $2.4 m + 21C$ (Guatemala/San Salvador)

$I = 2.7 m + 19C$
or $2.9 m + 21C$ (Costa Rica)

$I = 3.15m + 19C$
or $3.35m + 21cC$ (Honduras)

---

1. A similar technique is used by Ava Maritana de Martel: "Integracion y economico de escale" op.cit.

This has to be reduced to an annual charge.[1] It is assumed that,

depreciation is	8%[2] pa on straightline method;
maintenance is	4% of fixed investment
"normal" pre-tax return on capital is	13%
	25% of fixed investment.

However, this figure is rather arbitrary chosen and estimates are also made on the assumption that the annual capital charge is 35%.

These are clearly approximations, but are generally of the right order of magnitude. Thus the annual capital charges are:

	25%A	35%A	25%B	35%B
Guatemala/El Salvador	.6M + 5.25C	.8M + 7C	.55M + 4.75C	.7M + 6C
Honduras	.8 + 5.25C	1.1 + 7C	.775 + 4.75C	1.05 + 6C
Nicaragua	1.1 + 5.25C	1.5 + 7C	1.05 + 4.75C	1.4 + 6C
Costa Rica	.725 + 5.25C	1.0 + 7C	.675 + 4.75C	.9 + 6C

In order to simplify the calculations we take the highest estimate (35%A) and the lowest (25%B) for testing.

As far as labour is concerned this must also be expressed in terms of indivisibilities as the economies of scale function is also convex.

Readings were found for total spending on wages and salaries per unit output, at near to full capacity.

However, there are considerable difficulties involved in dealing with each county individually, and so a general function is taken, based on earlier data on labour costs. This is added into the above equations.

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1. The summation of different annual components on fixed investment is discussed in A. Merrett & A. Sykes: "Finance and Analysis of Capital Projects" Longmans 1963, pp. 39-42. The use of a simple 'annual charge' approach is, however, open to criticism e.g. the straight line depreciation estimate assumes that the life of equipment is known (i.e. no substantial/change) and that this convention, technical rather than replacement cost method, is followed.

2. The Honduran Census: (1966) indicates that 8% is about right.

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Diag. 10b

Summary Matrix of Transport Costs (Maximum) ¢ per Journey

	Guat. City	San Salvador	Tegucigalpa	S.P.S.	Managua	San Jose
Guatemala	-	8	22	20	28	42
Metapo	6	2	12	15	23	38
S.P.S.	20	12.5	10	1	22	35
Managua	28	24	17	22	2	17
San Jose	44	37	30	40	17	2
Imports (Total cost)	41	40	43	42	43	39

(1) Guatemala $T = ¢.85m + 6.25C$ (2) $¢ 1.2m + 8.5C$

(1) El Salvador $T = ¢.85m + 6.25C$ (2) $¢ 1.2m + 8.5C$

(1) Nicaragua $T = ¢1.35m + 6.25C$ (2) $¢ 1.8m + 8.5C$

(1) Costa Rica $T = ¢ .975m + 6.25C$ (2) $¢ 1.3m + 8.5C$

(1) Honduras $T = ¢1.075m + 6.25C$ (2) $¢ 1.4m + 8.5C$

B Proportional Costs

In addition to labour and capital charges there are proportional costs which are estimated to be ¢11 p.t., except in Costa Rica where they are ¢7 p.t. (based on Diag. 7). However, the major item is transport costs.

C Transport Costs

Transport cost data is readily available, but not always reliable. Diag. 10a shows a range of data available from various studies.[1] There are great varieties of cost depending not only on distance but on load size; road quality (asphalt, gravel etc); return or single journey; and the current state of demand and supply in the trucking industry. Diag. 10b gives a simplified matrix based on the above figures with some rounding and deduction for individual journeys. However, these transport costs are likely to change

1. United Nations (E.C.L.A.) "Transportation in Central America" E/CN.12/CEE/324.

over time, and with the larger transport flows which could be entailed by specialisation patterns that are likely to result from more concentrated production. So a separate lower estimate is made for transport costs and these are ⅓ less than the previous estimates. Finally, provision is allowed for the fact that the more costly journeys to the extremities could be reduced by barge or coastal ship journeys from say Puntarenas to Acajutla. This trade does not now exist, but on the basis of information supplied by a Panamanian shipping company in the cement trade and knowing port handling charges, it was possible to hazard guesses as to some likely costs.[1] It is quite possible that bulk rates of this kind could be obtained because of the possibility of transporting "clinker" in bulk, and milling later.

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1. However, the crucial factor here is port waiting time, since sea journeys in the area cost about $1 per ton per day for cement and should normally take three days over 500-1,000 kms. However, ships are frequently kept hovering outside port for five or six days due to congestion. According to information received, a 3 day sea journey can easily take ten days. As a fair approximation, $8 per ton could be taken as reasonable for a 'typical' journey. As regards port costs, there is a significant disparity between ports but costs depend significantly on bulk shipment, whether the load passes through customs or merely over the wharf, or on the current state of disrepair of the port. Port costs in the main ports vary between $2.5 and 7.5 per ton, but a working figure of $5 per ton is used for <u>each</u> port embarcation and disembarcation. Thus the sea and port costs are taken at $18 per ton for all journeys between distant Central American ports. Given the port-capital transport charges we get the following cases where total transhipment costs are lower than road journeys: Guatemala City to San Jose - Costa Rica ($25): El Salvador to San Jose ($26): San Pedro Sula to San Jose ($22.5): San Jose to Guatemala City ($27): San Jose to El Salvador ($26): San Jose to S.P.S. ($23.5). <u>Central American Transport Study</u>. Vol. II Part 8.
" " " " Vol. I I pp.393. or SIECA: "<u>Analysis and Perspectives of Ports in Central America</u>" SIECA/INFR-STTM - 1/D T.3.

Results

The model was run on a series of assumptions. The results in terms of possible feasible solutions is set out in Diag. 12.

Assumption I
(a) Transport costs are the minimum
(b) Economies of scale are run on a minimum assumption regarding indivisibilities.
(c) A tariff against imports of 50%.

Assumption II
(a) Transport Costs are the maximum.
(b) Economies of Scale are on a minimum assumption regarding indivisibilities.
(c) A tariff of 50%.

Assumption III
(a) Transport costs are at a maximum.
(b) Economies of scale are run on maximum assumptions.
(c) A tariff of 50%

Assumption IV
(a) Transport Costs - intermediate, i.e. high but excluding the more extreme journeys.
(b) Economies of scale is a maximum.
(c) A tariff of 50%.

Assumption V
(a) Transport costs at a minimum.
(b) Economies of scale maximum.
(c) A tariff of 50%

Assumption VI
(a) Transport Costs intermediate.
(b) Economies of Scale maximum.
(c) A tariff of 25%.

Various things come out of the results quite clearly:

(i) In no case is the autarkic solution optimal.
(ii) However, the overall cost advantage from the optimal solutions is only small, 10.5%, 5%, 6.5% 5%, 15.5% out of the various assumptions.

Diagram 12

Results

Assumption I

Configuration	Cost in £m.
*01001	17.95
*11001	18.00
10001	18.275
10101	18.375
01101	18.60
*11101	18.835
01011	19.065
10011	19.116
11011	19.275
10111	19.60
01111	19.80
*11111	20.05
01010	20.255
10010	20.40
11010	20.50
10110	20.755
01110	20.975
11110	21.225
00101	21.975
*010001	22.160
*01000	22.3
00111	22.335
01000	22.35
110001	22.40
101001	22.47
11000	22.56
10100	22.79
100001	22.91
111001	23.00
11100	23.06

Assumption II

Configuration		Cost in £m.
*11001		19.475
*11101		19.60
*11111		20.05
10111		20.45
*01001		20.74
.....		.....
.....		.....
111001	(Best imports)	23.00
.....		.....
.....		.....
01000	(Best single location)	27.78

Assumption III

*11001	22.50
*11101	22.95
*01001	23.42
10001	23.535
10101	23.84
*11111	23.85
01101	23.885
10111	23.90
10011	23.925
.....	.....
.....	.....
111001	27.0
101001	27.0
110001	27.15
.....	.....
01000	30.03

Cont'd.

00110	23.51
10000	23.57
00011	24.35
00010	24.89
001001	25.15
000101	25.53
00100	25.88
000011	26.36
00001	26.71
000001	35.34

Assumption IV

*11001	22.755
*01001	23.000
*11101	23.195
10101	23.195
01101	23.435
*11111	23.88
.....	.....
.....	.....
110001	26.3
.....	.....
*01000	27.27

Assumption V

*01001	20.425
10001	20.75
*11001	20.825
10101	21.175
01011	21.89
.....	.....
*11011	22.56
.....	.....
*11111	23.65
.....	.....
010001	24.31
01000	24.46

Assumption VI

11001	22.755
01001	23.00
100011	23.145
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
000001	28.1

(iii) Except for the most conservative assumption (II), the most acceptable pattern of development is for Salvador or Guatemala or both to produce with Costa Rica, and for Honduras and Nicaragua not to do so.

(iv) If the tariff is reduced to 25% then imports do become a good deal more attractive; however, only if the tariff were reduced to around 15% would an optimal solution involve any imports at all from outside the system.

(v) In all cases a single regional cement plant would be grossly sub-optimal, in the best case 15-20% worse than the optimal.

Various of the assumptions implied by the model were then tested to see to what extent it had produced a distortion.

(i) the assumption that demand is price inelastic, and the static nature of the model can be tested by trying different estimates of demand. The model is run on the assumption of what might be the demand in 1975.

(ii) We have also assumed 100% utilisation of capacity and if this assumption is relaxed this would also have the effect of increasing fixed capital costs, and thus a more decentralised solution, as the linearisation would take place over a larger range of capacity.

(iii) One of the likely errors arises from linearisation. If we take the three cases of, one (El Salvador) plant; capacity, 830,000 T.p.a.

or two plants (El Salvador & Costa Rica) 560,000 T.p.a. and 270,000 T.p.a.

or five plants

In the first case the difference between the investment predicted by the curve and that by linear approximation - $.5m.

In the second case the difference between the investment predicted by the curve and that by linear (approximation) is +$.8m.

In the third case the difference between the investment predicted by the curve and that by linear approximation is $.4m.

These can be reduced to annual charges of - $.125m; $2m; $.1m. These sums are far too small to affect the rank ordering seriously, but the general effect is to exaggerate the capital costs involved in either a very large or five/four very small plants while understating the capital costs of two or three equi-sized plants.

(iv) Another line of criticism is that we have taken all costs at market prices and have not distinguished between market and "shadow" costs. An interesting new approach to this is set out in the Little-Mirlees Manual[1] distinguishing a range "tradeable" goods, which would otherwise have saved or earned foreign exchange directly, or also indirectly, or also "non-tradeables". If all prices are quoted at world market prices a cost benefit analysis can be carried out, with the aim of finding a solution which minimises 'tradeable costs' i.e. : foreign exchange.

It can be seen from a quick check that deduction of non-tradeable costs has little effect on the result,[2] but as the inputed coefficients are so dubious it is scarcely worth doing a detailed calculation.

Implications of the Results

Let us assume that we adopted what appears to be one of the more realistic of the range of possibilities - say Assumption I, what implications does this have for the economies of the countries concerned?

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1. O.E.C.D. "Manual on Project Evaluation" Part II.

2. As we lack a full Central American input-output table it is extremely difficult to establish the full import content of elements of the cost. If we use the figures provided for Mexico in one of Little's case studies (pp.238-249) for fixed investment: 68% Tradeable 10% Labour 22% Residual (of which 68% is tradeable, 30% non-tradeable), i.e. in total 75% approximately tradeable; for transport and for the service sector as a whole, tradeable value is about 50% but this is very approximate. In addition,

Labour Costs	60% tradeable (excluding skilled people and management).
Electricity	85% tradeable
Fuel	90% tradeable (a guess - in Mexico, Fuel is locally obtained).
Raw Materials	Most non-tradeable.

First, let us take the theoretical figures and assume that the companies pursue an orthodox pricing policy in which consumers pay for the cost of transport. If we had a 560,000 ton factory in El Salvador and a 270,000 ton factory in Costa Rica then the annual capital and labour charges in the two cases would be : ₡7.8 per ton in El Salvador; ₡10 per ton in Costa Rica. Given the variable costs which we have hitherto assumed, this means exfactory costs of ₡19 in El Salvador and ₡17 in Costa Rica, i.e.

	(1) Theoretical "Optimum" Market Prices (if optimum solution were adopted)	(2) ₡ per ton Theoretical "National Prices" (if five plant solution were adopted)	(3) Actual Prices
Guatemala	23.5	24.5	22
San Salvador	20.0	23.5	25
S.P.S.	30.5	27.5	28
Tegucigalpa	28.5	34.5	38
Managua	28.0	30.0	32
San Jose	17.0	19.0	22

There would be a general gain in 'consumer welfare' in all the countries, except (marginally) in Guatemala and San Pedro Sula. However, the main benefit of the new distribution of plant accrues to the producing countries - Salvador and Costa Rica. The effect of decentralisation on annual cement costs would be (approximately) Guatemala ₡400,000; El Salvador ₡800,000; Honduras ₡180,000; Nicaragua ₡250,000; Costa Rica ₡450,000.

What is much more significant is the effect on national income as the "saving" is, to some extent, reduced value added. We assume that

(i) there are no multiplier effects,

(ii) that the benefits of transport costs accrue to the five countries on the same basis as if they had "national" production,

(iii) that the "local content" of the following components of expenditure is as follows:

fixed investment	25%
Electricity	35%

Fuel	15%
Labour	75%
Raw Materials	85%

These are only guesses, but they do give us a set of figures with which to work.

As a result of increasing their output from a "national" level to being regional plants, El Salvador(200,000 t.p.a. to 560,000 t.p.a.); and Costa Rica(160,000 t.p.a. to 270,000 t.p.a.); gain $3,700,000 and $950,000 respectively in national income terms.

The annual "loss" from ceasing production is:

Guatemala	=	$3.35m.
Honduras	=	$1.65 m.
Nicaragua	=	$.65 m.

To all countries there is an increase in value added to the transport sector (60% local costs). - $2.150,000 in total - divided in proportion to consumption.

Thus the net balancing out of "local income" gains and losses is:

Guatemala	$-3.0m.
El Salvador	$+4.0 m
Honduras	$-1.85 m.
Nicaragua	$-1.85 m
Costa Rica	$+1.20 m.

In order to save the region about 10% of cement annual turnover of $ 2m. (or about two thirds or three quarters of that in foreign exchange) there is also a "saving" in the form of reduced local payments in the former producer states. Thus, although one can demonstrate the theoretical advantages of a more centralised pattern of production, there would be a considerable redistribution problem in offsetting losses and spreading benefits as the gains and losses on the income side are greater than the savings from more efficient cement production, in individual cases.

Conclusion

Some of the inefficiency and high cost of the industry can be attributed to the duplication of plant. However, if we also take into account the high transport costs of the Central American area, the savings from centralisation are relatively small and there is a significant range of error in estimation. If the theoretical solution were turned into practice, there would be serious income and employment effects in individual countries which might be considered sufficiently inconvenient to avoid accepting a rationalisation of production.

Programming Model II : Time Phasing[1]

We have asserted that there are two aspects to the "optimum capacity" problem. Here we shall deal with the second. To what extent is it desirable to select a capacity for a proposed plant above present requirements in anticipation of the growth of the market? The problem of securing an optimum plant capacity lies in the fact that a larger plant, though enjoying economies of scale, will operate below full capacity initially, when heavy fixed charges will have to be carried. Conversely, a plant which is too small will pass up benefits from economies of scale. Our aim is to work out a time path for investment which is optimal, minimising costs, for a given market growth, social discount rate and economies of scale factor.

Data Used

(1) Discount rate; there is little guidance here. 10% seems an absolute minimum as a rate of time preference in the risky and unstable environment of Central America; 15% was tried for sensitivity purposes.

(2) An annual demand increment was obtained by approximating to the growth path of the last few years. The result will be biased towards excessively small plant sizes in later years.

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1. A. Manne: "Investments for Capacity Expansion, Size, Location and Time Phasing" op.cit.

(3) For investment and other non-constant costs, there are various elements:

(i) the investment cost itself every p years, but made once and for all time,

(ii) annual charges directly related to the investment cost, such as spare parts, maintenance etc., adding, perhaps, 3 or 5% a year.

(iii) A more difficult problem was labour which is known to enjoy economies of scale, but in no easily quantifyable way. It is assumed (somewhat arbitrarily) to enjoy the same economies of scale function and to have a fixed capital labour relationship such that, in Central American conditions, labour costs come to something like 5% of fixed investment. Thus, 8-10% of the investment cost needs to be added or discounted at 10% to infinity, which is equivalent to 80% of the investment cost.[1]

Also, the plant will have to be replaced after depreciation. If we assume as in the "static" example, that the plant wears out after every 12½ years, then there is an annual "replacement factor" such as to add 15% to the present value of the investment,[2] assuming straight line depreciation.

So we need to add 95-100% to the investment costs. This is near enough to 100% to assume that doubling is a reasonable approximation.

Therefore, if the original function is $\log I = 1035\ (c)^{.715}$

then we can assume $\log I = 2070\ (c)^{.715}$

Two further adjustments are called for. First, very often in the cement industry additions to capacity take the form of extensions to existing plants rather than new ones. Some idea of the average number of kilns can be obtained from Cembureau, the world cement directory, which provides the following

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1. A. Merrett & A. Sykes: op.cit. p.9, ("Cash flows into perpetuity").

2. Ibid. Ch. 2.

evidence of Latin America kiln sizes (1963).

One kiln	32	
two "	22	This distribution may just give figures for
three "	15	plants at different stages of the life cycle
four "	10	though it can be seen that even then, there
five	3	is a considerable number with several kilns.

We adopt Manne's convention of assuming that every other extension to capacity is in the form of a new kiln rather than a new plant, and with 75% of the investment cost.

Second, above a certain capacity range of kiln, economies of scale are no longer so important and so it is assumed that above 400,000 T.p.a. the curve is linear.

Results

The basic object of the exercise was to establish the benefit to be derived from multinational planning. If we take, initially, a discount rate of 10% and the lower estimate of transport costs and, if we take the best of three ordering combinations and compare it with the 'closed' solution, we get: (for ordering 5, 4, 3, 2, 1).

	"Open" Solution (with trade)	"Closed" Solution (without trade)
Total Discounted Costs Terminal Value	$80.463m.	$85.034
Of which manufacturing costs are	62.275	74.68
Of which transport costs are	18.187 (i.e. intraregional trade transport costs)	10.350 (i.e. international trade transport costs)

Optimum time cycles etc. are as follows.

	"Open" solution			"Closed" solution		
	cycle	start	size	cycle	start	size
Location 1	24 yrs.	yr. 1	600,000	4 yrs.	1st yr.	100,000 ton
2	24 "	" 15	408,000	4 "	" "	68,000 "
3	12 "	" 10	168,000	4 "	" "	56,000 "
4	12 "	" 6	144,000	4 "	" "	48,000 "
5	6 "	" 2	108,000	4 "	" "	72,000 "

It can be seen that there are advantages to be derived from a planning approach. Optimum time cycles are considerably lengthened by allowing the possibility of trade, and the optimum kiln size very substantially increased in several cases (quadrupled or quintupled) to permit economies of scale in manufacturing and labour costs. However, transport costs rise rapidly too with increased interchange and almost offset the potential gains; though on balance, deferring construction and incurring a transport cost penalty is beneficial. There are small proportional costs to be considered too, but on the assumptions chosen about 5-7% of cement costs could be saved, with a time phasing policy. As we have only considered a very small number of ordering sequences (6) it is very likely that a better sequence could be found.

What this "optimum" solution implies is that Guatemala effectively becomes the main regional producer of cement for the next five year planning period, with Costa Rica supplying itself and Nicaragua. In the sixth year, Nicaragua produces initially for export, but later for self-sufficiency. Later, Honduras, El Salvador constrict plants though largely for self-sufficiency apart from supplies to Tegucigalpa.

In the following diagram, one can see the importance of international trade under the "optimum" system.

	Trade	Production (over year 0)
Year 1	61,000T	86,000T
2	86,000T	172,000T
3	129,000T	258,000T
4	172,000T	344,000T
5	215,000T	430,000T
6	186,000T	516,000T
7	235,000T	602,000T
8	240,000T	630,000T
9	280,000T	774,000T
10	170,000T	860,000T
11	187,000T	946,000T
12	204,000T	1,032,600T
13	265,000T	1,118,000T
14	290,000T	1,204,000T
15	78,000T	1,290,000T
16	102,000T	1,376,000T
17	130,000T	1,462,000T
18	84,000T	1,548,000T
19	116,000T	1,634,000T
20	112,000T	1,716,000T
21	126,000T	1,798,000T
22	-	1,880,000T
23	-	1,962,000T
24	-	2,044,000T

The level of trade rises to a peak of nearly 300,000T declining towards the end of the cycle. (The fixed cycle concept artificially deflates the later predictions of trade). Certainly, far more trade is envisaged than at present and in the recent past - and this excludes border or seasonal traffic.

However, it is worth looking at some of the simplifications that have been made to see how the results would be affected.

Computational Detail: one of the significant features, and weaknesses, of the exercise is that the results are susceptible to the influence of whatever

sequence is used for examing the regions. Six sequences were examined giving the following total costs:

	(£'000)	
1, 2, 3, 4, 5	83.505	
5, 4, 3, 2, 1	80.463	(chosen)
4, 1, 3, 5, 2	82.871	
3, 2, 5, 1, 4	83.544	
5, 1, 4, 3, 2	84.389	

Had a more exhaustive analysis been carried out, a lower "optimum" might have been reached.

Discount Rate: if a discount rate of 15% is taken, this does not greatly affect the relative advantage/disadvantage of centralised/decentralised solutions but the overall magnitude of costs is considerably affected. With low transport costs and the same combinations as before, we have:

Ordering		
1, 2, 3, 4, 5	60.333	
5, 4, 3, 2, 1	59.549	(Closed - approx. 63.75)
4, 1, 3, 5, 2	59.990	

Transport Costs: if a higher set of transport costs are taken, a more decentralised pattern is made to look slightly more attractive:

Ordering		
1, 2, 3, 4, 5	82.833	
5, 4, 3, 2, 1	87.067	(Closed is 86.276)
4, 1, 3, 5, 2	85.413	
3, 2, 5, 1, 4	89.799	
2, 1, 4, 5, 3	82.071	
2, 4, 3, 1, 5	85.806	

In this case the optimal solution has much shorter time cycles than the previous optimum (every country produces from an earlier date) and trade is, therefore, much less imports.

	"Optimum" Cycle	Start	Size
Guatemala	6 yrs.	3 yrs.	150,000
El Salvador	12 "	5 "	204,000
Honduras	8 "	2 "	112,000
Nicaragua	8 "	5 "	96,000
Costa Rica	6 "	1 "	108,000

Therefore, with a higher transport costs assumption, there would be smaller plants and a much more "self-sufficient" solution.

Economies of Scale: purely for cross checking purposes, an estimate was also made of the effect of assuming an extremely small economies of scale factor.

In this case, labour and other non-investment economies of scale were assumed away and replacement too. A less significant economies of scale parameter was also chosen, i.e. $I = 525\ (C)^{.8}$.

The effect of this on the overall results is not all that significant. In this case the "closed" solution has terminal costs of 53.78m and three year cycles and (using a 10% discount rate and "low" transport costs),

the open solutions have costs as follows:

1, 2, 3, 4, 5	51.07 (all four year cycles)
5, 4, 3, 2, 1	62.04
4, 1, 3, 5, 2	52.69 (mostly six year cycles)
3, 2, 5, 1, 4	63.08
2, 1, 4, 5, 3	52.959
2, 4, 3, 1, 5	53.427

Even in this case there are small gains from lengthening the time cycle to four years, by phasing in regional imports.

Demand: the computer programme was not adapted to deal with this geometric growth, though this would have been more realistic than arithmetic growth. The

effect of a geometric growth would be to produce optimal time-cycles of gradually increasing, rather than constant length.

Conclusion: under a considerable array of different assumptions, it can be shown that there are gains to the region from planning out future capacity expansion multinationally in such a way as to permit larger kilns with better utilisation of capacity. In so much as planning ahead already exists in the region, it will take three years or so to use up existing spare capacity. In that period the new Guatemalan plant (capacity since 300,000 T.p.a.) and an extension to the Costa Rican plant (capacity 250,000 T.p.a. approx.) are to be installed. Were these plans to be put back for several years, these two extensions could provide any new Central American demand over the subsequent 7-8 years if the other three countries could be persuaded to maintain only their present capacity.

CASE STUDY

Appendix II

Petroleum Refining

Introduction:

The second study was of the petroleum refining industry in Central America. As in the case of cement there has been an evolution of refing capacity based largely on national markets, and the building (and extension) of refineries has proceeded rapidly over the 1962-69 period. By 1970, there were six, and average capacity utilisation was as low as 50%.[1] As with the cement industry, any cooperation would at this stage be, of necessity, a time-planning operation rather than a location decision, but it is of interest to spell out the implications of existing policy.

Central America has no known oil or natural gas reserves though oil companies have made exploratory efforts notably in Guatemala and Nicaragua. Refineries have been therefore "market-based" rather than "source based" or "export" refineries, and the Central American countries number amongst those of small developing countries seeking to achieve partial import-substitution by refining. The case for import-substitution in Central America is accepted in principle as a starting point, as did the U.N.[2] The hypothesis to be tested is that the allocation of refining capacity in 'national' refineries is grossly sub-optimal in as much as it leeds to a neglect of the substantial economies of scale in refinery investment costs.

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1. As compared with a figure of 95% on the overall refing operations of one major (Shell) - direct information.

2. United Nations (E.C.L.A.) "La integration economica de Central-america; evolucion y perspectivas: (La refineria de petroleos en Centro-america)" (E/CN 12/CCE/GT.IND/3) 1956.

However, there are several problems involved in studying this industry from the point of view of a location/time planning, programing approach:

(i) it is arguable whether refining is, economically, a separate industry. It usually represents one stage in the operations of vertically integrated multinational firms and as such the concept of "price" and "profit" is less likely to be meaningful than in other industries.

(ii) refining technology is a good deal more complex than in - say - a cement plant, and there are many possibilities in respect of ancillary equipment depending on the crude used and market served. To reduce these refinements to easily manageable pieces of data is difficult. Technology is also changing the method of production rapidly.[1]

Therefore, there is a good case for initially looking at;

(i) refining technology.

(ii) the nature of the oil industry as a multinational industry.

A. Oil Refining & Technology

As the technology of oil refing is inextricably tied up with its economics, some basic background should be given. The two factors which determine the product output of a refinery are:

(a) the nature of the crude oil input.

(b) the complexity of the refinery, which is itself determined by market requirements.

A very simple refinery could consist of little more than a distillation column with facilities for extracting the various fractions.

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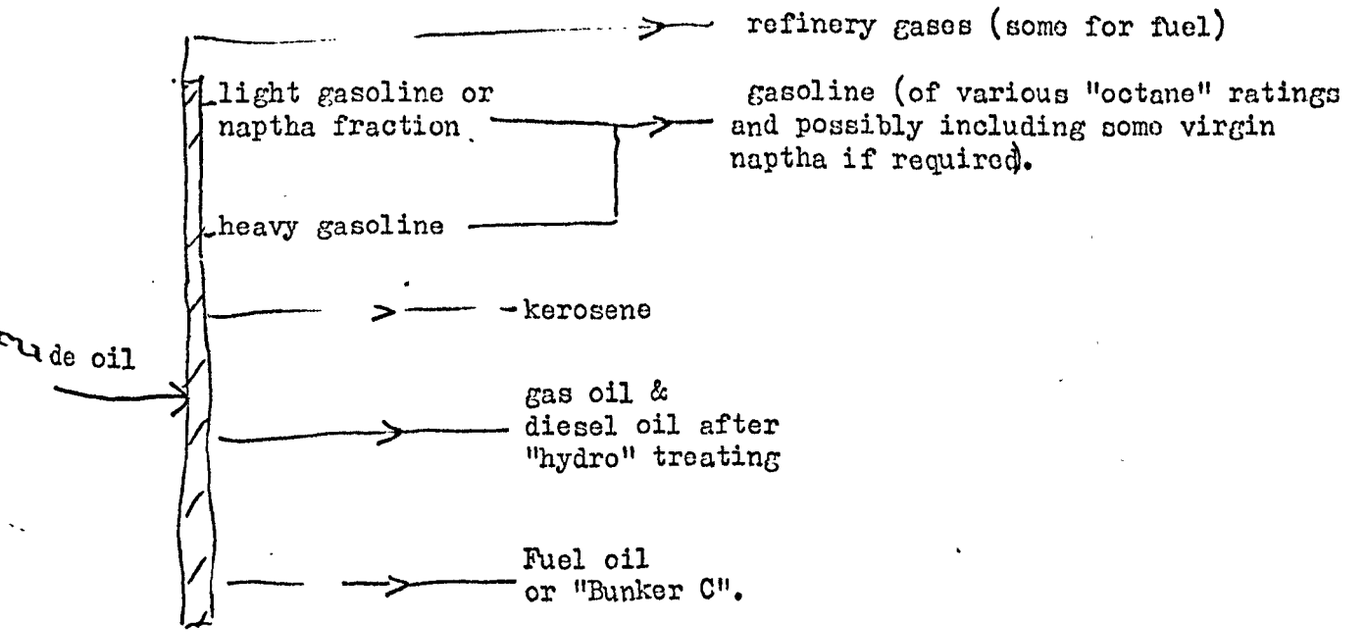
1. e.g. in the last few years there has been a big step forward with the development of 'hydro-cracking' to increase petrochemical feed-stock yield from a refinery: "The Chemical Industry in Perspective", American Chemical Society, (1970-71), (J.T. Jensen & M.F. Stewart).



The composition of the final output will depend on the API rating, (i.e. inverse of specific gravity) and to some extent on the source of the oil. The following diagram[1] gives an indication of the significance of a change in specific gravity.

	Medium crude (circa, 30° API.)	Heavy Crude (say around or less than 20° API.)
Gas	1.0%	.3%
Gasoline	16.0%	5.8%
Kerosene	5.0%	5.7%
Diesel & Heating oil	18.0%	20.3%
Fuel oil	60.0%	67.9%

The heavier the crude - the less gasoline and the more the fuel oil: a very heavy crude (e.g. Bac Raquero of API 11°) would give only 2 - 3% gasoline: and a light crude (say 35°) could yield 30% gasoline.

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1. United Nations, "Techniques of Petroleum Development"; Article by Gamer, Page 182.

Product yields are varied by the addition of various process units.

(a) a catalytic reformer: this has the effect of raising the overall gasoline yield (16% to 20% for a medium crude) and improving its quality.

(b) a catalytic cracker: this unit cracks heavy fractions down to gasoline and other, heavier, fractions. In this way the gasoline content can be greatly increased, usually at the expense of fuel oil.

It is reasonably valid to assert that a combination of these three basic processes plus variation in crude composition can meet almost all variations in market requirments that a country is likely to face[1] : though in some cases imports or exports (e.g. of a product like Kerosene which is subsidiary and of which it is difficult to vary the yield) may be appropriate. One significant feature of the large refinery flexibility is that we do not have a real 'joint product' problem since the petroleum products in surplus (or at least the 'heavy' fractions) can be reduced to others. Gasoline itself is derived from naptha which can be convected to gasoline or used as a petrochemical feedstock.

B. The International Oil Industry[2]

The economics of refining cannot be understood in isolation from that of the rest of the industry. The mean features of the industry are three: first its largest firms are vertically integrated, owning exploration, production, refining, transportation and marketing facilities: second, because of geographical exigences producer countries do not overlap very well with consumers and so the firms are often 'multinational': third, concentration of ownership is considerable, with a few dominant world wide concerns,

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1. There are several other processes that are likely to be encountered in practice too:
(a) "hydro-finishing" and other desulphurisation processes: to remove the sulphur compounds that are common especially in Venezualan crude.
(b) petrochemical polymerisation and extraction units: this will be discussed. One of the main by-products of cracking is the production of refines which are the basic building blocks for many petrochemical products.

2. The industry is described by inter alia: Edith Penrose: "The Large International Firm in Developing Countries", M Tanzer "The Political Economy of International Oil and the Underdeveloped Countries". London 1970.

/concerns,[1] and this has led to behaviour of an "oligopolistic" kind. This is a greatly oversimplified picture however, There are many 'second-rank' oil companies; Phillips, Continental, Burmah, Humble and Italy's state run ENI, which are very significant; though the "majors" control two thirds of the final market. One of the features of the smaller operators is that they tend to be deficient in one or other section of the vertical chain and thus to lack the short term flexibility and security of the largest companies. This partly explains why they have lost some of their share of the market in recent years. Also, connected with the existance of "independents" is the non-international nature of many segments of the industry e.g. Pemex controls all aspects of Mexican Oil, while other countries have partially nationalised or "independent"parts of the production process. On basis of information provided by Shell, independents have 30% of overall operations turnover (mainly crude supply) and 10% of refining capacity, both figures falling.

However, the main point of dispute is the degree of price competition in the industry, and this in turn dictates the extent to which the multinational companies are able to disregard national interest. Opinions vary strongly. Critics of the industry argue that the industry operates as collusive or price-led oligopoly with each firm earning substantial 'monopoly' profits, and saving sufficiently small competition to be able to fix "transfer prices" between parts of a company of crude, "knowhow", services, etc. regardless of national boundaries.[2] These prices are fixed to maximise

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1. Notably the "seven sisters"; they are, Standard Oil-New Jersey (brand name - Esso) Shell, B.P., Standard Oil - California, Mobil, Texas (Texaco), Gulf.

2. This is a somewhat oversimplified interpretation of the line of arguement to be found in P. Odell. "Oil & World Power", (Penguin 1970) and "Economic Geography of Oil", Bell 1963, "Oil: The New Commanding Height": Fabian Research Series, 251, and also in M Tanzer "The Political Economy of Oil" Ch.2. J E Harthorn: "El Petroleo", "Empresas Privadas y Gobierno" 1967, Ch.9.

profits in a preferred country, with disregard for the taxation or foreign exchange position of any client state. Prices would be set in the final product market to maximise overall profits to the industry

and by deducting back marketing, refining and transport costs one would obtain a crude "price" which includes a substantial profit element to be appropriated in royalties by the exporter country or retained as profit by the company. In so much as there is competition in the industry it is, according to the critics, of a non-price variety i.e. firms try to expand their share of the retail market by providing more attractive marketing outlets, or their share of refing capacity by offering favourable construction agreements, and in this way create a market for the highly profitable crude oil. But it is in the interest of no firm to reduce the product price which would have the effect of eliminating the profit for which they are competing.

However, the companies would argue that price competition is extremely important;[1] that it has been induced partly by the influence of independent oil producers short of marketing and refining outlets who try to improve their market position by price cutting, and also by the pressure of governments in potential oil producing countries insisting that their oil deposits be developed post-haste (with the implied threat of using an independent) and so creating a situation of 'over-supply'. Whether for this reason or improved techniques, crude prices fell steadily over the last decade, and "transfer" prices bear an increasingly close relation to the market prices as determined by "arms length" sales (between companies or from independent

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1. e.g. R Chandler "The Myth of Oil Power", International Affairs, Oct 1970, pp 710-718.

sellers).

However, the picture varies greatly from place to place. In some cases there is clear evidence that companies have exploited, collectively, their positions as crude oil suppliers: India is perhaps the worst example.[1] However, even in that case the government had the counter of importing cheaper Russian crude. Central American countries, with no bargaining power, unsophisticated governments and little global importance are likely to suffer particularly badly from the oil companies' activities.

One further point is the practice of having "posted prices" for crude oil exports (and products). This system was partly introduced as a guideline to transfer prices, but is preserved largely at the bidding of exporting countries who by fixing a national export price are able to preserve a base for taxation evaluation and for ensuring that exports are 'fairly' valued in terms of foreign exchange.

Such has been the trend in world demand and supply, that actually traded world crude prices are now significantly less than 'posted' prices. This can be seen from the diagram below: the free market prices representing "arms-length" sales between companies or from companies to independent refineries or vice versa.

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1. See P. Odell: "Oil & World Power" op. cit. Ch.7. p.140.
M Tanzer "The Political Economy of Oil" op. cit.

(Venezualian prices of API 25.5 crude: as recorded in Petroleum Press June 1970, pp 215.)

	Ave. 1968	1969
Posted Prices	$2.25	$2.25
Ave realised price	1.82	1.81
Discount offered by Company selling crude oil.	.43	.44 (15%)

Product prices are also fixed on a 'posted price' basis, but they are more flexible and confirm better to reality.

However, in so much as an integrated company handles cross-border trade, say from a refinery to distributors, or from crude supply to refinery there is no obligation upon it, except convenience, to price the transferred fuel at either "posted" or "arms-length" (market) prices unless a government insists upon it. The ability to sell crude and products at above world "arms-length" prices depends on the degree of control which one oil company has over retail outlets (or refining). This control is likely to be greater in small developing countries like those in Central America.

This has led to a growing interest in independent refiners. However, there has been mixed experience with independents. They can make a substantial "local" profit when there is a "bearish" crude oil market, but they can easily find themselves in difficulties when crude is scarce, and when the large profits go to independent crude suppliers. They have about 10% of the world capacity, but this is declinging and most countries seem now to prefer the established oil companies for stability.

The Central American Industry.

The Central American situation will be discussed under several

headings, below. However the salient points are as follows:

First, imported oil is the only significant supply of fuel. Local energy requirements are being increasingly met by hydro-electricity, but there is no known local oil or natural gas or other fuel. Diag. 1 gives the profile of energy supplied by the electricity industry. Second, consumption of oil products is growing rapidly, somewhat faster than GNP, due in some measure to the interest now being shown in industrialisation. Third, foreign exchange is seen to constitute a major constraint on development and import saving one of the main goals of policy. Of the total Central American import bill in 1963 fuel costs (direct) were 7%, though this has declined since.

Finally, the marketing and refining of oil is almost entirely in the hands of the main oil companies notably ESSO (Standard New Jersey).

Production & Exploration [1]

All the five countries (and Panama) have favourable oil legislation with generous concessions for exploration. Despite promising geological structures interested wanted for a period after $50m had been spent in the 1950's without result.[2] No commercial discoveries had been made, though there have been shows of oil and gas. The main activity has been concentrated on the Atlantic coasts of Nicaragua[3] and Honduras. The Peten region of Guatemala attracted attention for a long period, but exploration in now being made in the Atlantic and Pacific coastal zones. Costa Rica is also experiencing a revival in interest. The particular attraction of the area

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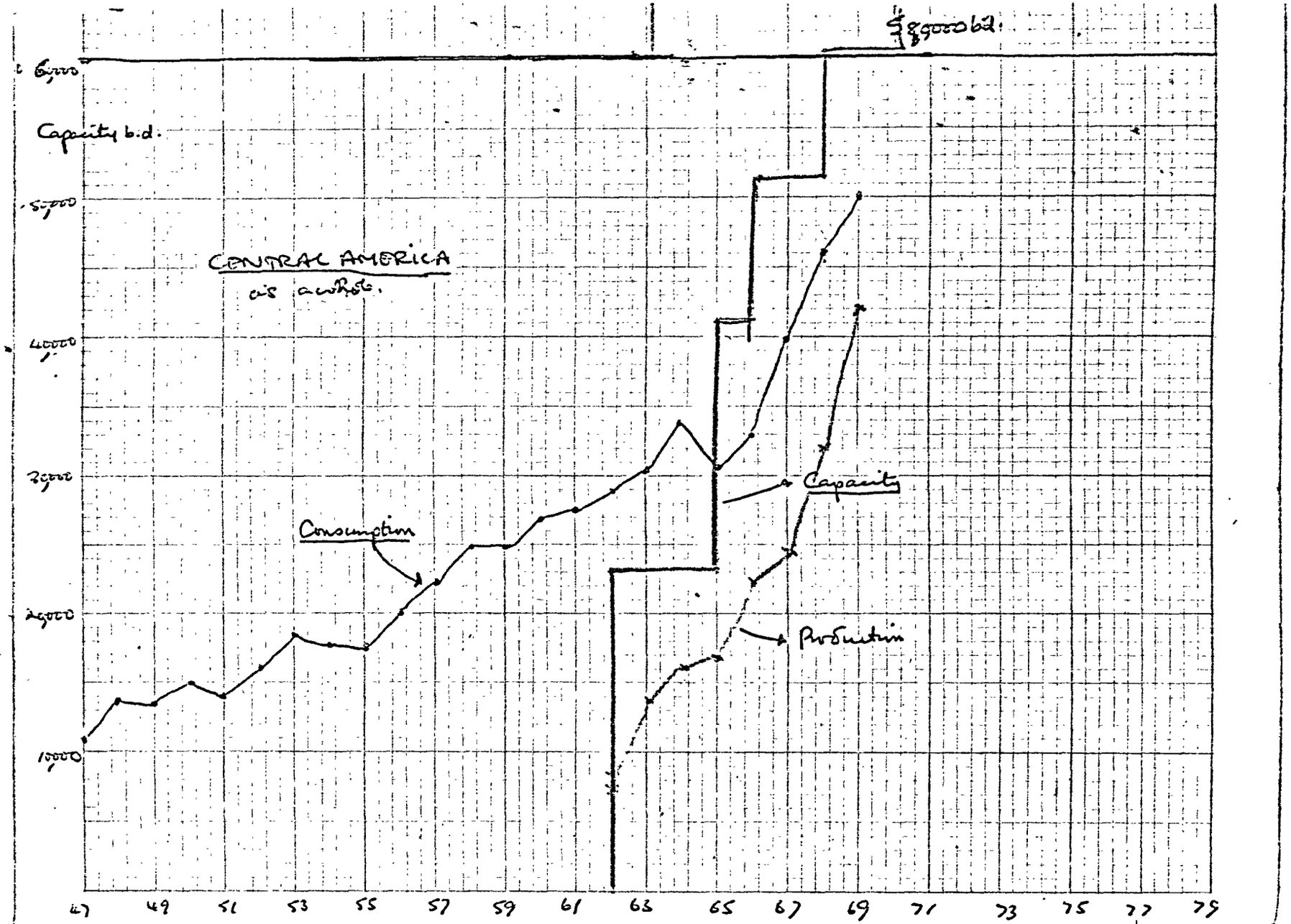
1. Detailed information is given in Petroleum Press Service 1969 (November); also in ICAITI. "Geological Resources in Central America".

2. Left wing and nationalist spokesmen in several countries, especially Guatemala, claim that oil was discovered that the oil companies are holding the deposits in reserve.

3. Economist Intelligence Unit, Bulletin No 3 1970; says $40m has been spent there over the last 40 years.


60,000
Capacity b.d.
50,000
CENTRAL AMERICA
40,000
30,000
Consumption
Capacity
20,000
Production
10,000
47
49
51
53
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59
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65
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77
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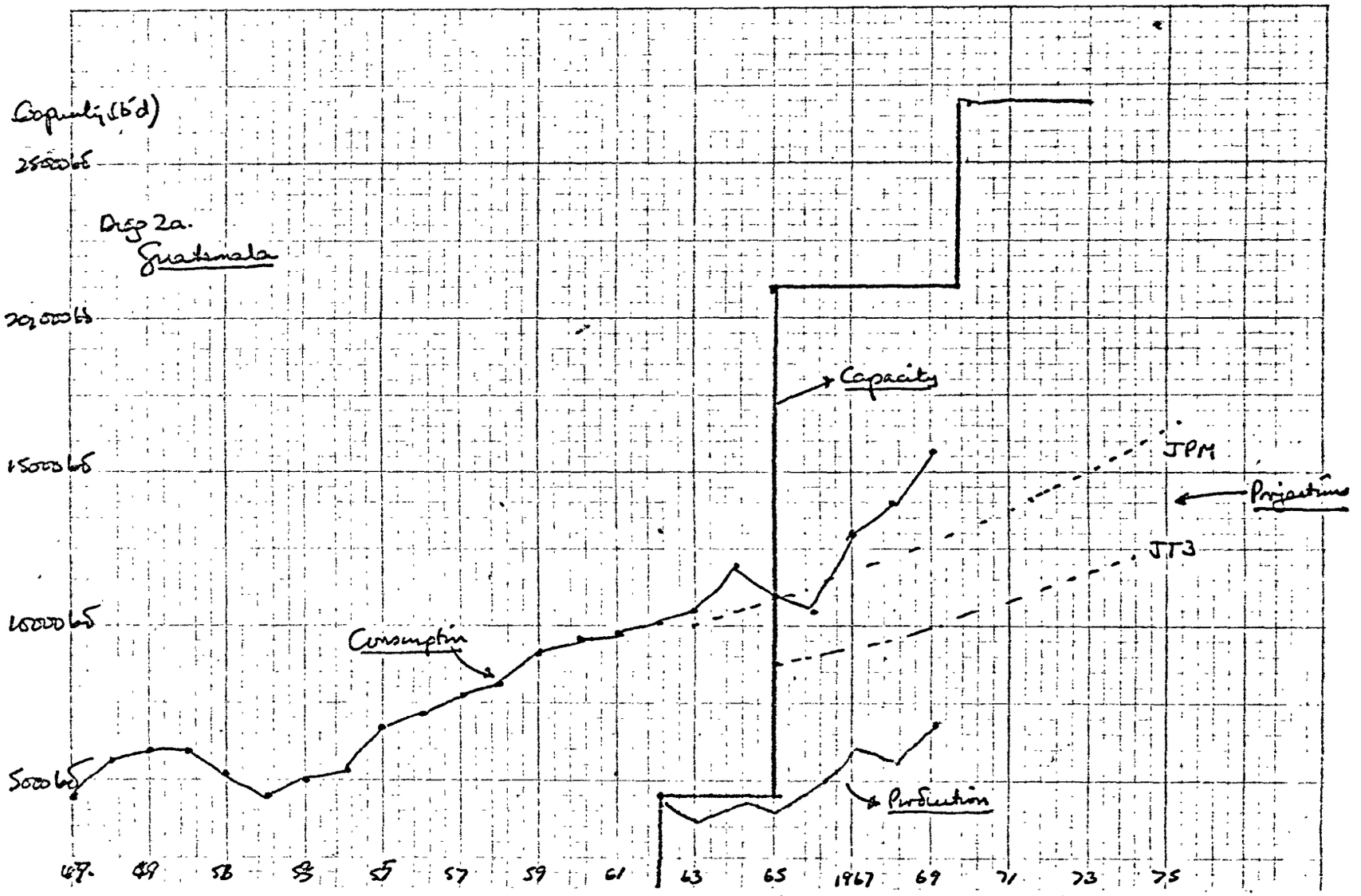
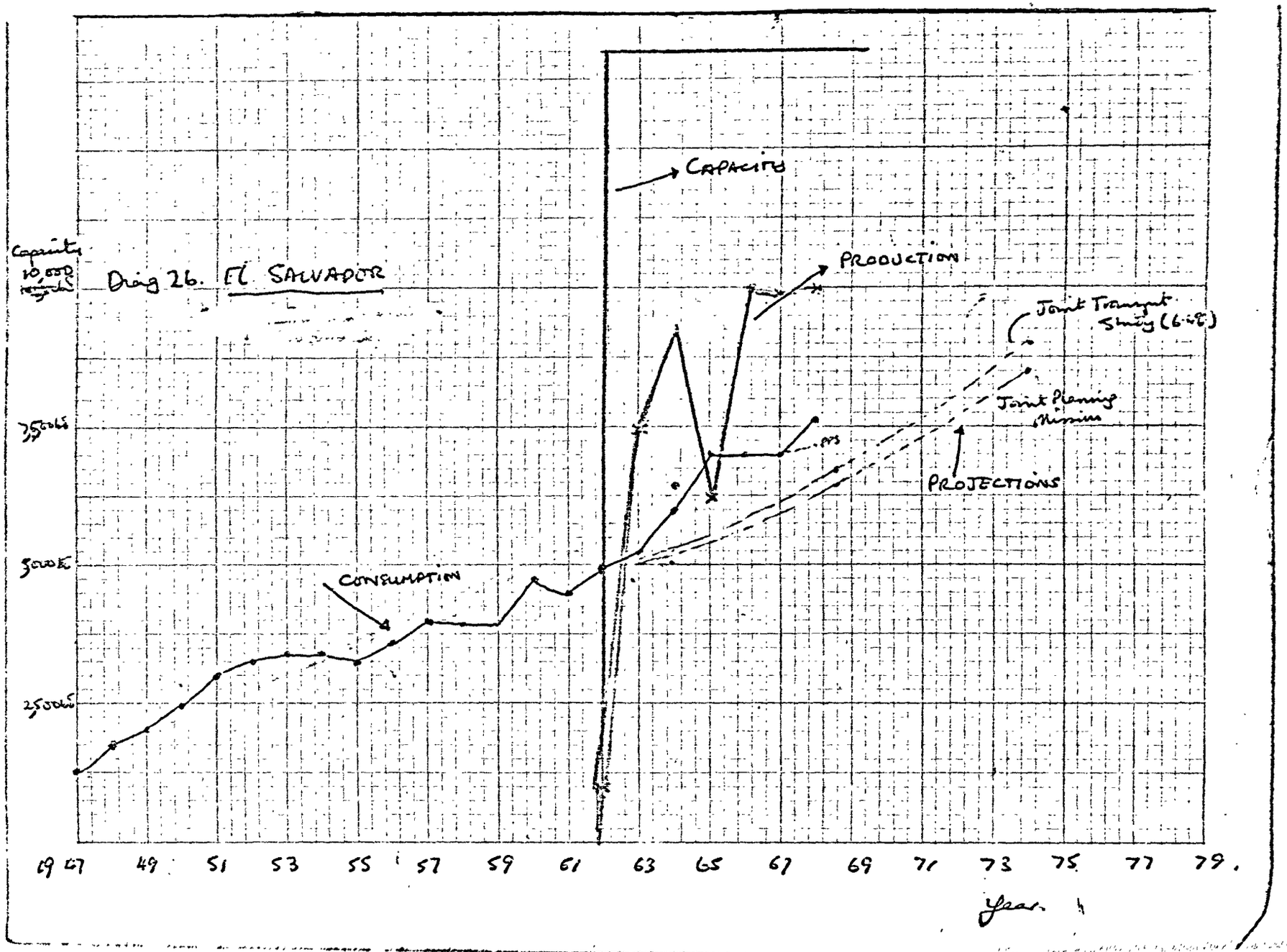
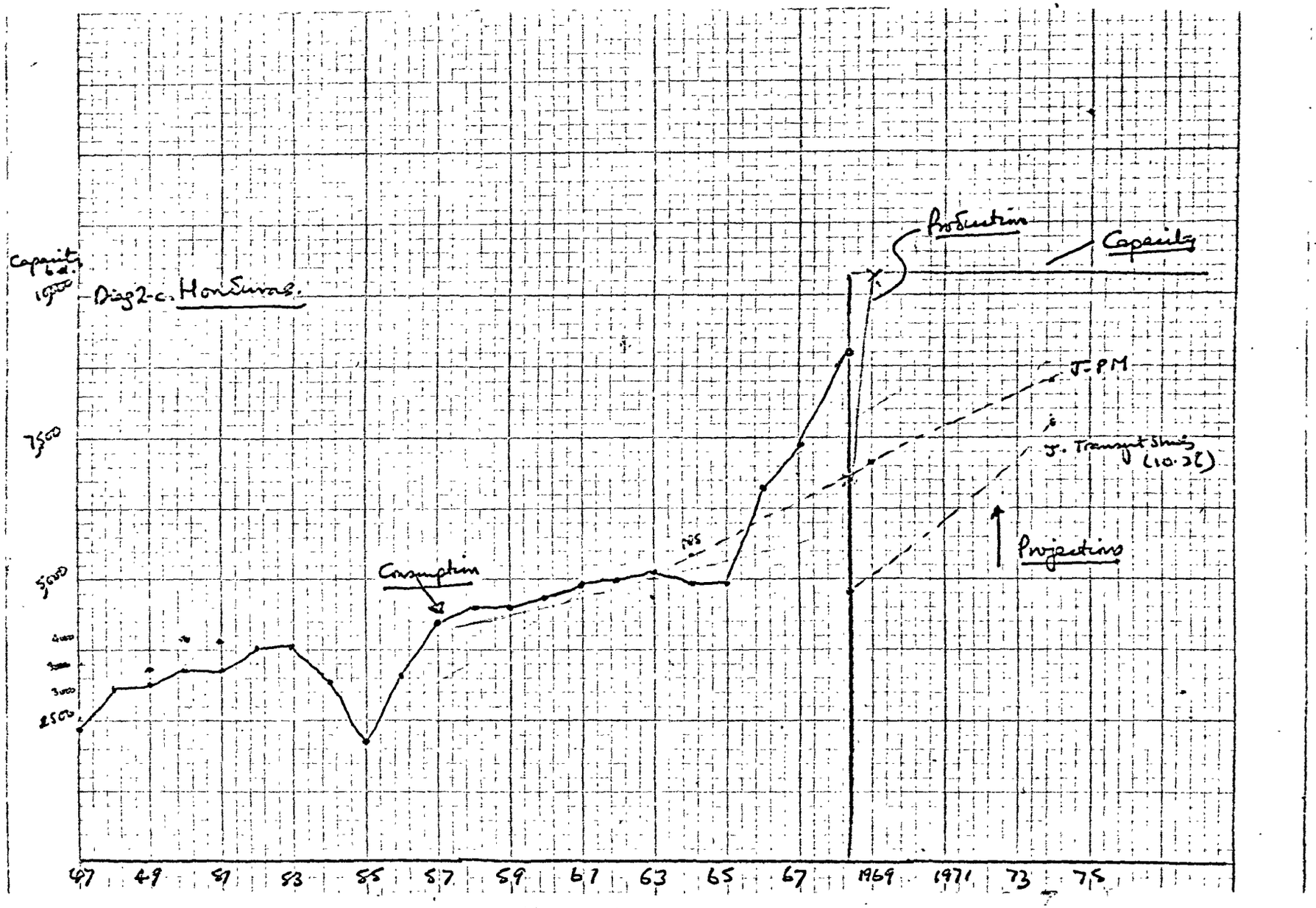
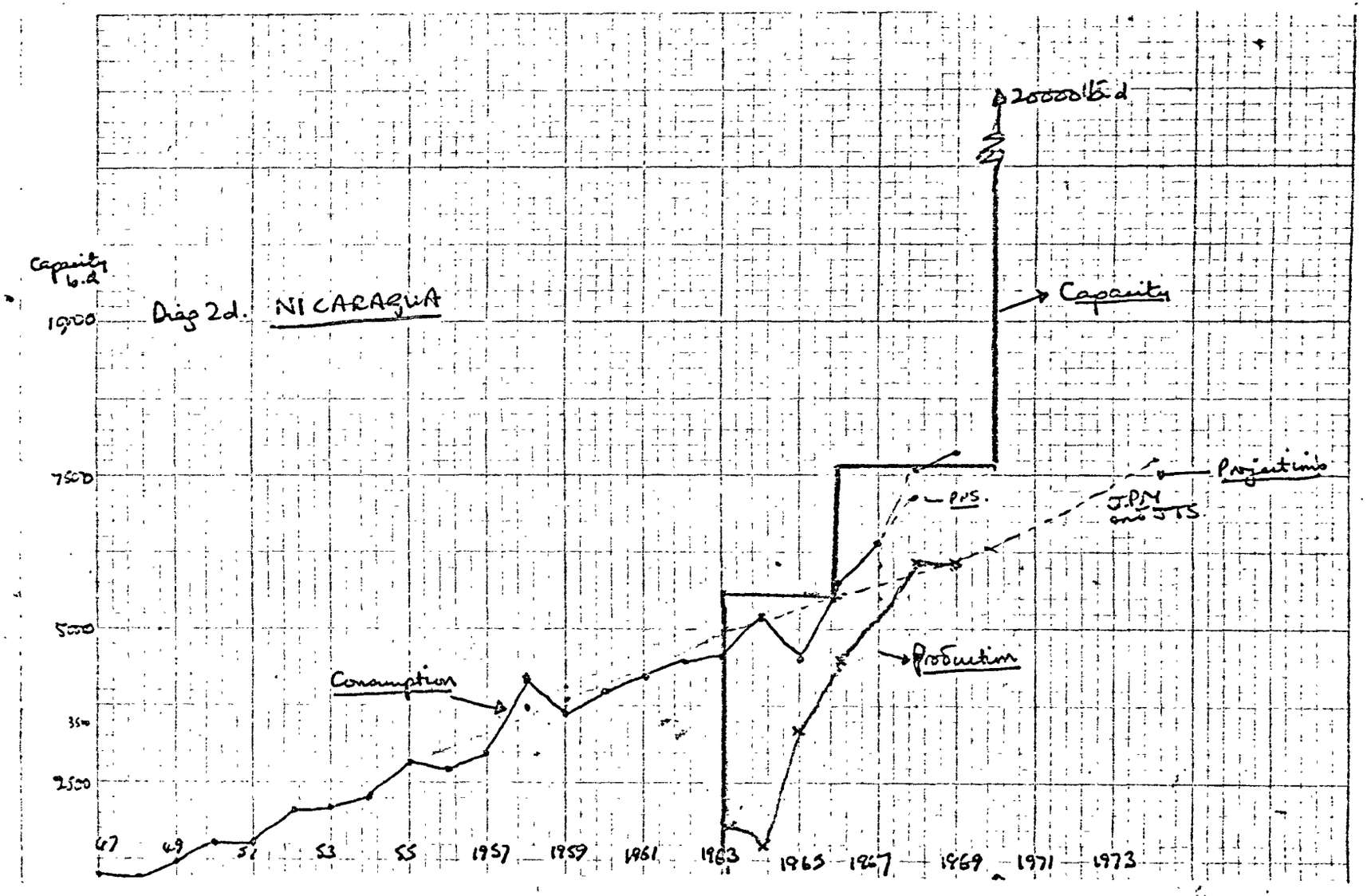
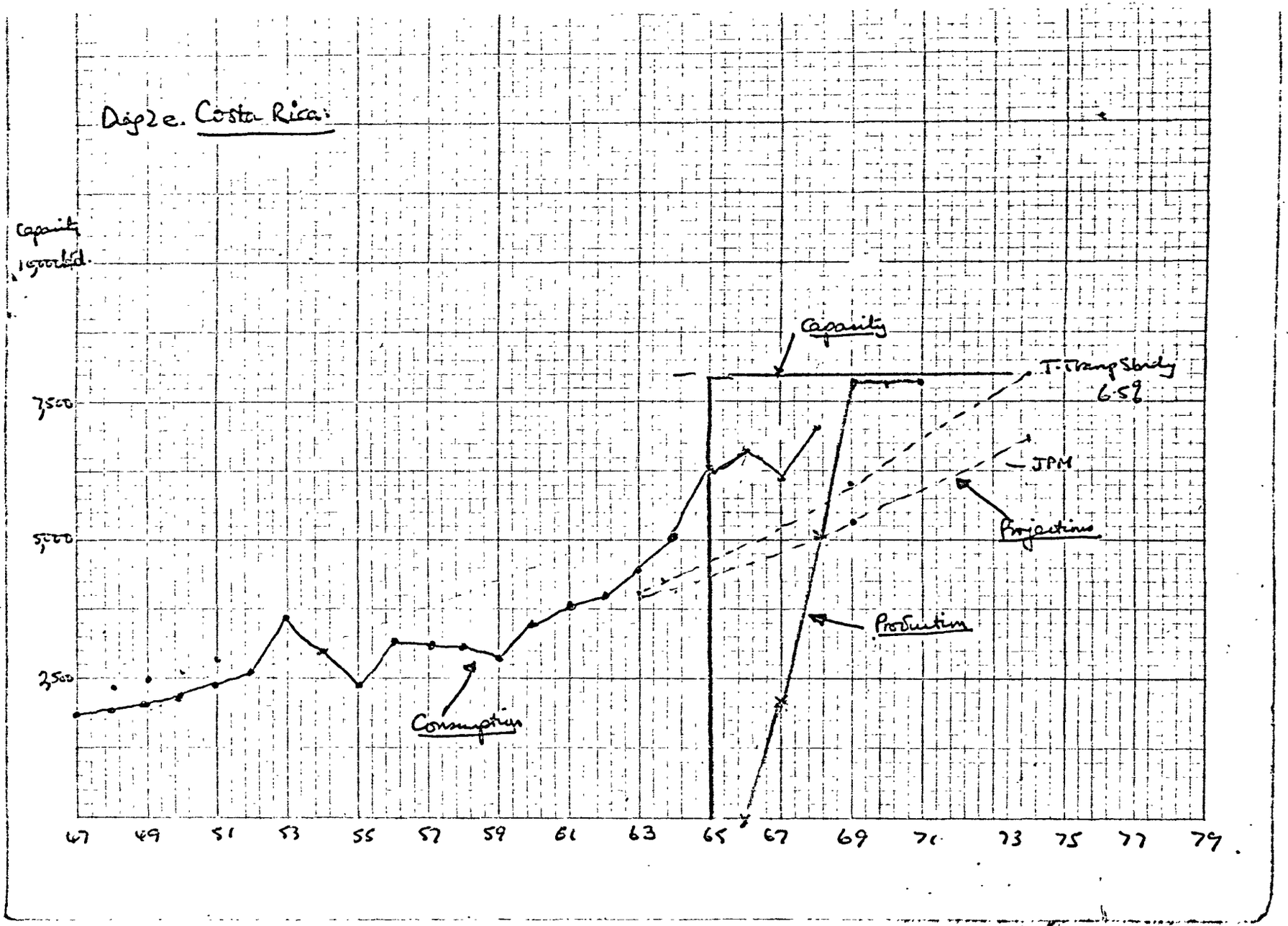


Dig 2a.
Guatemala


Diag 26. EL SALVADOR
Capacity 10,000 metric tons
75,000
50,000
25,000
CAPACITY
PRODUCTION
Joint Transport Study (6-68)
Joint Planning Mission
PROJECTIONS
CONSUMPTION
47 49 51 53 55 57 59 61 63 65 67 69 71 73 75 77 79
Year


Capacity
10,000
Diag 2-c. Honduras.
7500
5000
4000
3000
2500
Production
Capacity
J. P M
J. Transport Stats (10.2%)
Projection
Consumption
705
47
49
51
53
55
57
59
61
63
65
67
1969
1971
73
75


Capacity b.d
Diag 2d. NICARAGUA
10,000
7500
5000
3500
2500
20000 b/d
Capacity
Projections
P.D.S.
J.P.N. and J.T.S.
Consumption
Production
47
49
51
53
55
1957
1959
1961
1963
1965
1967
1969
1971
1973


Dgp2e. Costa Rica:
Capacity
1,000 bbl.
7,500
5,000
2,500
Capacity
T. Trend Stability
6.5%
JPM
Projections
Production
Consumption
67
49
51
53
55
57
59
61
63
65
67
69
71
73
75
77
79

are the favourable attitude of all the governments to foreign investment and the generous concessions. This is helping to offset previous frustration. However, nothing has yet been found.

Demand

The growth of demand for petroleum products is interesting from two points of view - the trend rate and in terms of product composition.

The trend rate is shown in Diag.2. (graphs 1-6). [1]

Over the long period; 1950-68, we can get the following semilog regressions.

Log consumption (El Salvador)	= 3.3956 + .02496 t (.001226)	R^2	= .9812
(Guatamala)	= 3.3666 + .02510 t (.001910)	R^2	= .9542
(Honduras)	= 3.3435 + .02113 t (.003271)	R^2	= .8429
(Nicaragua)	= 3.3187 + .03541 t (.002154)	R^2	= .9699
(Costa Rica)	= 3.3076 + .02593 t (.002698)	R^2	= .9190

This implies geometric growth rates of 5.9%, 5.9%, 4.9%, 8.3%, 6.2%.

However, there have been movements around the general trend and especially over the 1966-69 period there has been a significant increase in demand of about 12% p.a. overall and over 15% p.a. in Honduras. In almost all cases projections made in the early 1960's by planning bodies were conservative.

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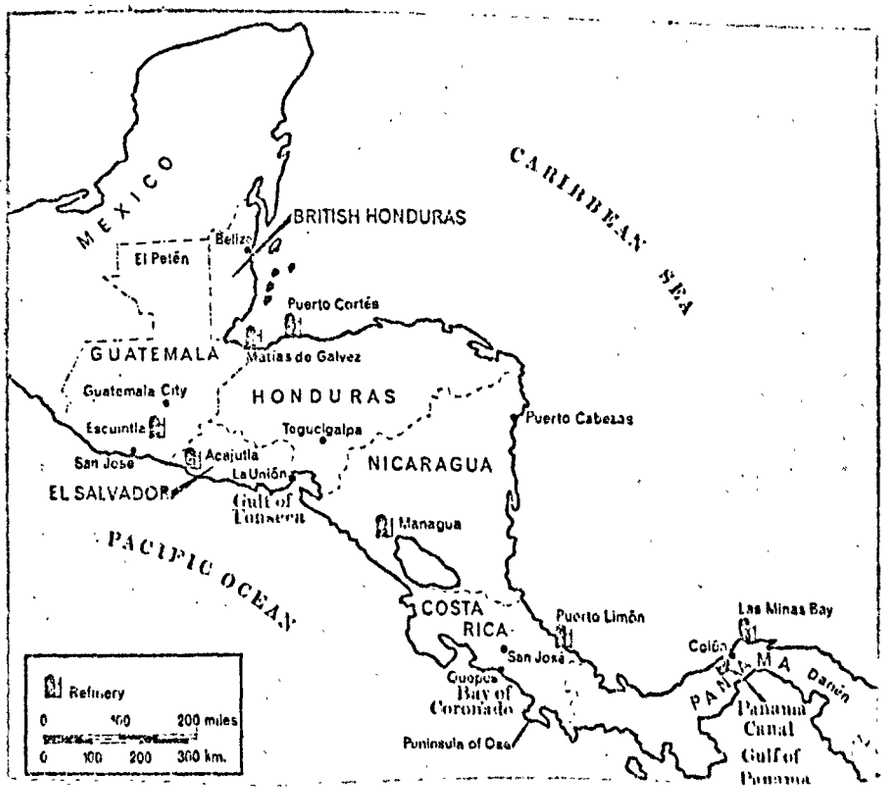
1. In all cases demand is expressed in terms of barrels per day of crude oil (on the rough conversion rate of 1 barrel per day = 50 metric tons per annum of crude). This assumes a 350 day year and a conversion of 7 barrels per MT ton or a 365 day year and a conversion of 7.30 barrels per MT ton which is close to the world average.


MEXICO
BRITISH HONDURAS
CARIBBEAN SEA
Belize
El Petén
Puerto Cortés
GUATEMALA
Matías de Galvez
Guatemala City
HONDURAS
Escuintla
Tegucigalpa
Puerto Cabezas
San José
Acajutla
La Unión
NICARAGUA
EL SALVADOR
Gulf of Fonseca
Managua
PACIFIC OCEAN
COSTA RICA
Puerto Limón
Las Minas Bay
Colón
San José
Quepos
Bay of Coronado
Peninsula of Osa
PANAMA
Darién
Panama Canal
Gulf of Panama
Refinery
0 100 200 miles
0 100 200 300 km.

In terms of consumption, as a function of growth in GNP, the follwing relationships were established: (over 1950-68).

			R^2.
Guatemala	: log consumption =	-1.192 + 1.276 log x (.045) (.096)	.955
El Salvador	: " " =	-0.683 + 1.039 log x (.026) (.046)	.983
Honduras	: " " =	-1.219 + 1.252 log x (.065) (.154)	.892
Nicaragua	: " " =	-1.265 + 1.410 log x (.063) (.108)	.954
Costa Rica	: " " =	+ .200 + .982 log x (.070) (.113)	.903

The coefficients diverge considerably, in two countries there bing a rate of growth around that of the GNP and in the three others, a rate of growth substantially greater.

Diagram 3 given an indication of consumption by product. Data is not complete, but gasoline demand as an overall percentage of output consumed amounts to less than 20% in Honduras (over a long period - in 1958/60 as well as 1969) and is as high as 34% in Nicaragua. Costa Rica is intermediate (28%, and around 30% for over several years) while El Salvador and Guatemala seem to be at roughly the same level. This general pattern indicates a gasoline consumption (including aviation fuel plus high and low octane gasoline) of around 30% of the total, which conforms to the overall Latin American pattern. The deviations are probably explained by 'abnormal' luxury car consumption in Nicaragua: on the other hand Honduras is a poor country with appalling roads, much of the national income being generated in the Northern banana growing areas where there is little opportunity for a high degree of car usage.

Kerosene is used for paraffin heating - lighting and cooking by low income families. Its use is very well developed in Salvador (18% of total consumption) but less so elseshere - 5.5% to 9% - which is about the Latin American trend.

Production and Demand Patterns (8)

	El Salvador		Nicaragua		Costa Rica		Honduras		Guatemala		South American "Average"
	1958-60 Consumption	1967 Consumption	1962 Consumption	1968 Consumption	1964 Consumption	1968 Consumption	1958-60 Consumption	1969 Production Exports (bbls/day)	1958-60 Consumption	1968 Production	1965 consumption
L.P.G.			.5	2	-	2	-	35,500 (1%)	-	39,000 (2%)	1.5%
Gasoline	39	27.5	30.5	34	32.5	28	19	675,000 (18%) 282,200	28%	693,000 (25%)	30%
Kerosene	14.5	18	7.8	10	5	8	5	182,000 (5%)	6.5%	138,000 (7%)	8.5%
Diesel Oil / Gas Oil / Fuel Oil / Bunker C	44.5	53	32 / 28 = 59.8	28 / 24 = 52	58.5	39 / 19 = 58	72.5	1,013,000 (29%) 572,300 1,587,000 (42%) 1,283,000	64%	(690,000 (29%) (739,000 (37%)	18.7% 28.0% = 46.7%
Lubrication and others	2	1.5	4	2	4	3	3		1.5%		13.5 to 15%
Waste/etc. consumption						3	-	200,000 (5%)			

Data derived from (1) pre 1963/4. Import Statistics; as in ECLA "Possibilities for integrated industries in Central America": 1963.

(2) Subsequent figures from annual "Annuario Estadistico de Commercio Exterior" of SIECA. (Cuadro XIV p.34.) - plus production figures from refineries

Conversion Rates: IM. ton = 8.5 barrels gasoline
IM. ton = 7.25 barrels diesel oil
IM. ton = 6.95 barrels residual fuel oil.

(3) South America (Data from Cuadro 32. E/CN 12/744: La Industria Petrochemica en America Latina).

The major element in consumption, but a declining one, is the heavier fraction of gas oil/diesel oil and fuel oil. Diesel oil is consumed very largely by diesel powered motor vhicles and as such will tend to increase in proportion to the rise in commercial road traffic. Fuel oil is the fuel for many manufacturing establishments (esp. cenent), for thermal electrical generating units (which are being replaced by hydro-power) and by the railways. In Costa Rica the most 'developed' country, diesel oil fractions are much more important: in Honduras it is the other way round reflecting the relative importance of rail v. road transport and the form of development of electric power generation.

The relative changes in the importance of the different consumption fractions seen below for the region as a whole:

	1946	1953	1959	1966
Gasoline	.18%	26%	30%	31%
Kerosene	4%	5%	7%	9%
Diesel/Fuel Oil	75%	65%	58.5%	57%
Asphalt	1%	2%	2.5%	1.5%
Others	2%	2%	2%	1.5%

The profile corresponds increasingly to an American pattern as regards gasoline (but not European - which is much more sparing in this respect). One feature of the Central American product range is the negligible importance of "others" : this is due to the absence of any real demand, as yet, for petro-chemical feedstocks.

C. Refining:

Diag. 4 shows the basic information on plant size, distribution and ownership. The most significant feature is the smallness of the plants: the other is the role of the big companies. How did this evolve?

Diag. 4. Production and Capacity of Refineries.

Refinery owned by-	Size of (barrels per day). Establishment.	Expansion	Current (b.d) capacity	Features
Guatemala - (Atlantic) 60% Standard California 40% Shell (Bataanse Petroleum N.V.)	3,800 (in 1963)	to 12,000 (in 1965)	12,000	2,800 b.d. cat. reformer
Guatemala (Escuintla) 100% Texaco	9,000 (in 1965)	to 14,000 (in 1971)	14,000	3,300 cat. reform
Honduras (Cortez-Atlantic) 100% Texaco	10,300 (in 1968)	-	10,300	b.d cat. reformer. 1,600 \ 2,700 b.d hydro- unit. desulphurisation
El Salvador (Acujutla) 65% Standard Jersey 35% Shell	14,000 (in 1963)	-	14,000	2,600 reform cat., 10,000 hydro- desulphurisation
Nicaragua (Managua) 100% New Jersey	5,500 (in 1963)	to 7,900 (in 1965 currently adding 14,000)	21,500 (14,000 operational)	8,000 cat. reform.
Costa Rica (Limon) 85% Gulf (sold in 1968 by Continental oil alias Allied Chemicals)	8,000 (in 1966)	-	8,000 (disputed)	3,000 themal cracker 1,200 cat. reformer.
Panama (Les Minas Bay) 33⅓% Ultramar-Courtaulds 33⅓% Universe Tank ships 33⅓% National Bulk-carriers.			75,000	27,000 thimal cracker 8,400 cat. reformer + bitumen + visbreaking unit.

The case for refining: this was established in the mid 1950's.[1] The basic arguments for refining were in terms of possible import-saving through the contribution of value added locally rather than elsewhere; also from the fact that transport costs on imported crude oil are less than transport charges on products;[2] employment creation; and the possibilities for a "spin-off" to petrochemicals - and in 1960, with demand growing on a 12% trend and regional market of 30,000 b/d this seemed a real possibility.

There were of course problems. To achieve net import substitution makes assumptions about prices of products and crude, before and after, and there are problems of achieving a proper product balance and disposing of surpluses of particular products.

Given a commitment to refine the question was then one of selecting a sensible regional strategy. And this involved defing an approach to the oil companies. The following alternatives were open;[3]

1. One was for the governments to ask the leading distributor in the area, Standard Jersey, to make arrangements for refining. Prior to 1962 this company had been a dominant, if not a monopoly supplier, and if they refined there would be a minimum disruption to the distribution network. On the other hand it would give the company a perfect regional monopoly as competing distributors would have to buy from a 'hostile' refinery. As far as the company itself was concerned the advantages were balanced by the costs and risks of tying up a large amount of capital in a region

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1. (E.C.L.A.) (Vyasulu) United Nations "Refinacion de petroleo y aceites Minerales" (La industria quinnica pesada), 1965 Mexico.

2. Due to the need for separating the products and carrying them in smaller compartments.

3. M Tanzer: "The Political Economy of Oil", op cit. explains in Ch. 2 & 9 the possible roles of client governments and putative refining companies.

which is unstable and which was already yielding a good profit.

Standard, or not, the other advantages of using a 'major' are the ease with which any imbalances in product supply can be coped with and the 'security' of having both a reputable operator and a guaranteed crude source.

2. A way of trying to get these advantages without strengthening Standard's position would be to approach another major e.g. Shell. This would have obvious attractions for the Company as they could then obtain control of the regional market without the costly and difficult job of competing on the retail side. The great danger here is that Standard would see their crude outlets threatened and seek to build a competitive refinery and thus precipitate wasteful competition.

3. An alternative idea would be to have an "independent" or else a publicly run refinery (on a turn-key basis in the latter case). Even assuming that there is a technically competent and financially reliable refiner available there is the risk of not having a guaranteed crude supply; and "independent" refiners have not had a happy history in recent years. Ideological bias probably rules out public ownership, let alone regional public ownership at the present time.

4. A fourth possibility is for the oil companies themselves to collaborate in building a refinery. This is prima facie the most sensible solution and several small African countries have employed it - indeed companies like Shell are themselves cooperative ventures. However, one is told by the companies that this approach presents serious "administrative difficulties".

As it happened the course of future development was determined by Shell, who had previously been active only in Guatemala, when it made a firm offer to

build a large - 10,000 bd - refinery for Salvador. As the move was considered a unilateral act by the other countries and Standard was obliged to take defensive steps to protect its position, the pattern of development was established on a competitive rather than a cooperative plane, Standard Jersey (Esso) proposed an additional project for Salvador (of 10,000 b.d.) and another for Nicaragua (of 5,000 bd); Guatamala embarked upon an extremely small project (of 4,000 bd) on the north coast which was initially managed by the constructing companys (Beaux Bridge) then taken over by Shell, (and later partly bought out by Standard California). A scramble took place for the remaining countries which wanted to refine (Costa Rica and Honduras) and the other big Central American operating 'major' - Texaco - established a second refinery in Guatemala, this time in the south in 1965. In Costa Rica, several companies had been competing from 1961/2, - Texaco and Phillips (a large 'minor' with strong crude oil interest in Venezuala) - and there were several proposals for "turnkey" projects. Competition was so strong that the companies were accused of interfering in Costa Rican politics by offering, over the the heads of the government, public amenities, and in particular a road from the north coast to the capital - to compete with the railroad monopoly. Phillips won, though ever since then there have been severe problems with the refinery.[1] The only remaining refinery project - on the Atlantic coast

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1. Data from a "Nacion" Special Supplement on the refinery (A San Jose newspaper) in 1970; and as given by Costa Rican civil servants e.g.,

A. The refinery incorporated an expensive catalytic cracker which failed to work: there were thus unexpectedly heavy capital charges.
B. Local marketers refused to cooperatie with the company and used hoarded stockpiles of imports when the new refinery came on stream.
C. A very expensive management and technical agreement with a refinery construction contract which escalated costs beyond expectation.
D. Delays in starting.
E. Inadequate share capital and large short term fixed interest liabilities.
F. The company claimed that its sales prices were fixed too low by the government.

of Honduras - was constructed in 1968 by Texaco.

Since the establishment of the refineries several have been expanded by the adding of further distillation units - as in Diag. 4. So far the establishment of refineries has not been accompanied by free trade, and by discrimination against retailers from other companies.

However, one must add that without the active support of the government, it would have been difficult for the duplication to have proceeded as far as it has purely on the strength of oil company preferences. The reasons for governmental enthusiasm for their own oil refineeries is not too for to seek;

(i) noneconomic reasons e.g. prestige and security:

(ii) import-saving: national governments perhaps tend to exagerate the net (as opposed to gross) import saving and see oil refining as a major part of the import substitution process.

(iii) employment: the benefits for a refinery in terms of men employed is very small indeed, but the prospect of 100 - 200 jobs is a considerable inducement where unemployment is a serious problem and Texaco were able to excit considerable popular support for their bid to build a refinery at Limon by (exaggerated) promises of jobs.

(iv) revenue: both as extraregional produced imports and as locally manufactured products, petroleum is a major source of revenue. In the absence of a complicated agreement over duty allocation there would be problems for all those countries which agreed not to produce as part of a multinational scheme.

Hypothesis: given the nature of oil refining in Central America it seems not unreasonable to support two hypotheses:

(a) such is the duplication of plant and the degree of control by the oil companies that there is little or no gain in foreign exchange from "import-substitution".

(b) that such inefficiency as occurs is largely the result of wasteful, unplanned location of plant.

Hypothesis (a) As regards the benefits from import-substitution, the critical factor is the price of crude relative to the price of products. Most of the agreements between refining companies and governments refer to the fact that "crude" and product prices are based on "posted prices Caribbean". If the oil companies were to take full advantage of this clause and sold to the refinery at "posted prices", and if it could be assumed that products would alternatively be bought at "posted prices" then the same difference gives some idea of the gross foreign exchange Savings made by a refinery. In fact crude of the low specific gravity needed by these refineries (it is 38° API reconstituted crude) has been posted in Venezuela,[1] at $2.80 to $2.85 per barrell for the last few years. If one takes 1969/70 product prices and "weight" by the output of a "typical" refinery the average is $2.55. Thus the imported products would be cheaper than the crude, let alone locally refined products, if one were to buy products at "posted" prices.

This in itslef a meaningless result as the "posted" prices of products than crude posted prices both diverge from the "real" transfer prices. However, it does indicate that were the companies to use their position to the fullest advantage, they could force a gravely unprofitable solution for the local subsidiary. Let us assume however, that the most benoficial circumstances prevail.

First, the company obtains a maximum discount on crude oil. During 1969-70 this brought the crude price down to $2.00 (data confirmed by both Costa Rican and Guatemalan sources) Second, the alternative of importing

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1. Figures from Platts Oil Indices; (Petroleum Press Service).

products would take place at no less than posted prices.

Let us now assume that a simple 10,000 bd. Central American refinery cost $10m. At least 80% of this cost is foreign exchange.[1] The annual capital charge of the refinery if we assume depreciation over 12 years a conservative rate of return on the refinery of 10%, works out at 17%. Add 3% for repairs and maintenance (say 1/3 of that local cost), then one has a minimum annual capital outlay of 60c per barrel with at the most-15c per barrel local cost.

Operating costs contribute 5c per barrel.[2] If we assume a 50% saving on transport costs which are currently about 30c per barrel from the Caribbean for crude then the following calculation can be made of prices cif Central America, or ex-refinery.

Pre-import substitution (weighted posted prices)		Post import substitution	
Products (f.o.b. Venezuala)	2.55	crude (with full discount)	2.00
Transport costs	.45	Transport cost of crude	.30
	$ 3.00 per barrel	Operating costs - fuel	.20
		labour & others	.15
		Capital costs	.60
			3.25

Even on the optimistic figures taken, there is no quantifyable saving in financial terms. The gross foreign exchange saving is about 20c per barrel , and - 5c net. These estimates could seriously be affected by a small rise in the crude price (or fall in discount) and by possible savings on the product side.

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1. One writer assumes 75%; (Hubbard in United Nations "Techniques of Petroleum Development" op. cit. p 220). The only major "local" item is the construction cost.

2. Based on Guatemalan data. Of the total cost, about 75% is local.

Experience seems to justify a pessimistic conclusion. Refinery managers that the author talked to, explained that in fact the refineries ran at a "loss", when their refinery prices were geared to posted prices in the Caribbean (even though the way that the comparison was made generally favoured the company, e.g. in Costa Rica, the exfactory price was computed on the assumption that any landed imported products would have had to pass through several of the companies costly pipeline and storage facilities when in practice they would not). Data from the Guatemalan refinery gave the following allocation of product "prices" (or allocation of costs).

1969	Barrells per annum	$ price per barrell	
Gasoline	615,000 < 200,000	4.39 (super)	weighted average $3.05 per barrell.
	< 415,000	3.56 (regular)	
Kerosene	122,000	4.05	
Diesel	727,000	3.22	
Fuel Oil	915,000	2.27	

It would appear that in Guatemalan exfactory prices are geared fairly closely to "posted prices" through a difference as small as 5 - 10c barrel can be highly important.

The validity of the import substitution exercise depends critically on certain assumptions that are somewhat dubious:

(a) that the company obtains the maximum crude discount.

However, the Costa Rican government and press have recently published a full expose of the affaris of the local refinery, RECOPE, which was under the effective control of Phillips Oil Co. Amongst the more damaging revelations was the fact that Phaillips (or Allied Chemical Co.) were, despite claims to be obtaining a maximum discount, habitually over-invoicing their Costa Rican subsidiary by 5c per barrel (which was frankly admitted) and that on one or two

occasions over-invoicing had been by as much as 80c per barrel!

As a result of these activities (and the other factors listed earlier) the refinery has been running at a "loss" ($2m. in 1968) and the Company has tried to get help from the government before selling out.

(b) that the alternative is importation at no less that posted product prices. The "posted" product prices are not a minimum however, and it is widely acknowledged in the oil industry that shrewd buying policies (or intensive competition in marketing) could obtain good discounts from Curacao or Aruba or Panama refineries.

(c) that the "retained" contribution of the project to the national income is as large as indicated. The net import substitution would be greater if the capital and operating costs made a greater contribution to local value added. The figures chosen are arbitary and rough, but it anything exaggerate the "local" contribution. It is almost certain that the saving in transport costs is exaggerated.

Though little data is available, it is probable that as several Central American refineries do make "paper losses" and as they also enjoy protection from imported products, that in fact the 'net local value added' is derisory or even negative. It might be stressed that where the product pattern is biased away from gasoline - as in Honduras - then there is less need for reconstituted crude and the import saving is much greater. Ironically, the Honduran market where this does occur was the last to be supplied.

However, it can be stated with some confidence that the foreign exchange component of refinery operating and investment costs in Central America is greater than the direct saving of local refining over the importing of products. And so, import substitution does not in fact 'save' foreign exchange.

Hypothesis (b) Most writers on the Central American scene have argued that the refining industry is irrationally organised. Under the heading "problem of duplication of investment : impact of national competition" the World Bank Mission[1] comment" at the present timeit appears possible to single out only the case of petroleum refineries as an example of an industrial branch whose structure has been severely affected under existing national competition" (they do not consider the cement situation abnormal). Odell comments "Central America provides an excellent case study of the develpment of refinery capacity in countries where the demand for petroleum products is insufficiently great to justify its construction." [2]

The Pan American Union[3] also single out the industry for criticism, but in a more circumspect way: "although the structure of industry is apparently deficient because it involves small refining units the committee believes no complete judgement can be made of this matter, but it is clear that six is an excessive number".

The criticism was due to the fact that the sacrifice of 'economies of scale' benefits in plants results in higher fixed costs (offset by savings in transportation costs on the finished products). Also, the demand pattern of petroleum products is such that simple small refineries cannot produce the required quantities of gasoline - they can yield only 20% instead of 30%. Therefore, they have the choice of installing a 'catalytic cracking' unit which adds greatly to the capital costs and which is simply unfeasible below a certain capacity, or importing gasoline. This latter policy has been adopted.

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1. World Bank Mission Study Vol. IV. (Industry) (WH 170a) 1967. p 34.

2. P Odell in "Economic Geography of Oil", op. cit. gives a detailed case history of the Central American situation. The quotation is taken from a seminar paper on the Oil Industry (L.S.E. 1963).

3. Pan American Union "Report on the Central American Development Plans and the process of Economic Integration, 1965-69" op. cit. p 94.

However, in order to save on the chartering of extra tankers, gasoline is imported in the form of reconstituted or semirefined crude with a high gasoline content.[1] Clearly this greatly reduces the potential import saving considerably. Finally, diseconomies are accentuated if there is a desire for petrochemicals as this adds to the demand for light fractions (naptha). In this case cracking is unavoidable, and thus very small refineries, as in Central America, cannot hope to serve as a basis for a petrochemical industry.

The "costs" of inefficient duplication of capital costs have to be carried (by someone). There are various possibilities. First the costs could be passed on to the consumer in higher product prices. This does not appear to happen in a dramatic way, but there is some evidence that it might still be an important factor.

There are differential tarriffs (i.e. between the external tariff and the local excise tax), on gasoline, of 5% in Guatemala and 7% in El Salvador. There are also restrictions on product imports where this is competitive with local products (as in Nicaragua). Also, various discounts which used to be offered (for example on bulk purchases of fuel oil by the railway companies) are no longer available.

Second, it is quite likely that at least part of the effect of additional costs on the consumer's cushioned by reduced government revenue[2];

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1. In Costa Rica this was not done and when the cracker broke down the refinery continued to operate on 30° API crude. As there was a surplus of fuel oil the refinery could only operate at 60% capacity, because there wasno outlet for the surplus product.

2. Virginia Watkin: Tax & Tax Harmonisation in Central America - Harvard Law School, 1967.

"there is a presumption that the burden of direct loss has been borne by government revenues since there is no evidence of increased costs of these products to consumers"[1] or "the rise in production costs has not yet been translated into a corresponding price increase but this is apparently due more to a decrease in tax pressures on this branch of industry"[2]. Unfortunately, there is not a great deal of evidence to back this up as can be seen from the figures below[3] on total fuel tax yield on imports and local products.

The following gives some indication of the taxes and tariffs employed.

Guatemala:	Gasoline:	19.6 cents per gallon	(+ 5c. p.g.) on imports
	Diesel:	5.3 " " "	"
	Others:	.1 " " "	"
El Salvador:	Gasoline:	25.6 " " "	(+ 7c. p.g.) on imports
	Diesel:	2.6 " " "	
	Banker C:	.7 " " "	"
Honduras:	Gasoline:	19.8 " " "	(imports 34 c.p.g.)
	Diesel:	2.6 " " "	
Nicaragua:	Gasoline:	17.00 " " "	(+ controls on imports)
	Diesel:	3.3 " " "	
Costa Rica:	Gasoline:	34.0 " " "	(import 48 c.p.g.) and 75% on diesel fuel in 1969)
	Diesel.	0 c.p.g.	

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1. World Bank Mission Study Vol IV, (Industry), Op. cit. p.34.

2. Pan American Union "Report on the Central American Development Plans etc", op. cit. p. 94.

3. p.25 at top

Total tax from fuel. ($m.)

	Guatemala	El Salvador	Honduras	Nicaragua	Costa Rica
1960					
1961					4.4
1962	5.7	5.6	3.9	5.4	4.0
1963)	6.8	6.3	2.2	4.7	4.5
1964)					
1965	5.8	7.1	2.4	5.9	5.4
1966	10	13.8	2.1	5.6	6.3

It appears that there has been no consistent loss of revenue since the refineries were introduced. However, it is difficult to make any direct comparison because of the amount of tax exemptions and the variation of taxes by product.

As the tax amounts in most cases to three times the average ex-refinery price of gasoline it would be very easy to offset the increased cost (at least as far as gasoline is concerned).

A third possibility is that the companies themselves absorb the cost by squeezing profit margins in distribution and by running the refineries if necessary at a loss. The oil companies would still have a strong incentive to secure an outlet for their crude oil which would protect their existing marketing system or else help to make inroads into a new market. The pre-supposition is that the oil companies are concerned to maximise their overall profits rather than the profits of any one stage of operation. This is the basic thesis of many writers on the oil industry who assume that profits and losses can be "shifted" easily forward or backward via variations in transfer prices and that the function of refinery is largely to secure a crude outlet.

Regional Trade

To what extent do the refineries try to mitigate the cost of small scale by regional trade? From Diagram 5, it can be deduced that there is virtually no trade between the countries except in the form of supplies from the

Diagram 5

	Total Product Imports (M Tons) (extraregional)	% of Consumption	Intraregional Trade (M Tons)	
1962	917,000	66	139,000	El Salvador to Guatemala + Costa Rica.
1963	958,000	63	164,000	
1964	1,023,000	60	229,000	205,000 El. Sal. to Guatemala - 16% gasoline, 78% kerosene, 75% fuel/Diesel oil; 24,000 El. Sal. to Costa Rica - 40% gasoline, 3% kerosene, 50% fuel/Diesel oil
1965	710,000	47	130,000	80,000 El. Sal. to Guatemala - 21% gasoline, 12% kerosene, 67% fuel/diesel oil; 50,000 El. Sal. to Costa Rica - 34% gasoline, 2% kerosene, 64% fuel/diesel oil
1966	557,000	34	54,000	El. Sal. to Costa Rica - 43% gasoline, 7% kerosene, 50% Fuel/diesel oil
1967	500,000	25	125,000	El. Sal. to Honduras - 42% gasoline, 14% kerosene, 44% fuel/diesel oil
1968	367,000	16	90,000	El. Sal. to Honduras - 38% gasoline, 17% kerosene, 45% fuel/diesel oil
1969	-		(45,000)	El. Sal. to Honduras (pre-war)

From SIECA "Annuario Estadistico de Commercio Exterior" 1964-5-6-7-8.
and "Compendio Exterior" 1962-63.

refinery at Acajutla to those countries which were not yet producing. There is no evidence of intra-regional trade being used to supply deficiencies in one or other products, though El Salvadorian exports tend to have a higher proportion of gasoline than the output of the refinery itself. However, there is no product specialisation in regional trade. Seen together with extra-regional imports it is clear that the five countries are heading for self-sufficiency in petroleum products.

Trade, at this stage, may not necessarily be beneficial. If oil companies were to force their retailers to sell products from the "home" refinery then there would be additional transportation costs without compensating economies. On the other hand, it is conceivable that a programme of planned staggering of extensions to capacity would be beneficial.

It would appear to be of advantage to test out the model used in the previous chapter to see to what extent economies of scale are being lost. To do this we have to identify the various costs of refining and transportation.

(a) Proportional Costs

The most important proportional cost is that of crude oil.[1] In an earlier example it was explained how a reasonable estimate for crude oil (Fob) was based on evidence from Costa Rica and Guatemala (Atlantic). In 1969/70 posted prices for 38° API crude were $2.80 - $2.85 per barrel, and average discounts were offered giving an effective fob price of $2.00 - $2.05 per barrel, to both refineries. In 1969/70 also, posted prices for 25.5° API were 2.25 per barrel and average realised prices $1.80 per barrel. The

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1. Nicaragua "Annuario de Central Bank" (1966) shows that 77% of total costs ex-refinery are crude oil imports c.i.f.

discount in this case is proportionately somewhat less, and, in practice, the price paid for reconstituted crude has been higher. The following prices were paid by Allied Chemical for 100,000 barrel shipload from Venezuela;[1] an overall average of $2.35 per barrel, against a $2.80 posted price.

			Posted Prices
1967	2.04		
	2.34	July, 1967	$2.80
	2.33		"
	2.33		"
	2.33		"
	2.58		"
1968	2.68		"
	2.68		"
	2.68		"
	2.05	Feb., 1968	"
	2.05		"

The price at any one time will reflect local and global supply and demand conditions for particular times, and for particular crudes: the series above reflects the tighter market caused by the war in the Middle East in June, 1967.

For the most part the crude required is in the very high API range but the following gives the range of crude posted prices:

35 to 37° API	$2.7 / $2.8	per barrel
31 to 32 "	2.55	" "
26 to 29 "	2.3	" "
16 "	1.85	" "
12 to 13 "	1.67	" "

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1. Data from government officials.

The other element in the crude costs - c.i.f.- is transport. A study on Guatemalan ports[1] estimates that the crude fare to Atlantic ports is 22.5c per barrel (at 7.5 barrel = 1 metric ton) and 40c per barrel to Pacific ports (the difference being 12.5c per barrel or 90c per MT for use of the Panama canal). In fact journeys to the more distant ports will cost more than to those of Costa Rica, but the difference is probably negligible. In fact, tanker charges have a tendency to severe fluctuations depending on supply and demand factors. The variable element is expressed as an AFRA factor.[2] The researcher was informed that in 1960/70 the charge for Puerto Barrios, Guatemala was 25c per barrel which is very close to the figures above.

Thus, it would seem reasonable to predict in 1970 world market conditions a c.i.f. price of around $2.3 per barrel at Atlantic ports and $2.5 per barrel at Pacific ports. As a realistic conversion rate for this density is 7.5 barrel per MT[3] the cost of crude oil is $17.25 per MT and $18.75 per MT.

By way of comparison it is interesting to compare these 'a priori' c.i.f. prices with those which are given in the trade statistics:[4]

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1. SIECA: "Investigacion de Trafico, Tarifas y Costos en Puertos de Guatemala". Guatemala, (1967, November).

2. Refers to a scale divided by the American Tanker Brokers Association.

3. Crude oil 40^{o} API = 7.6 barrels p. MT
   35^{o} API = 7.4 " " "
   25^{o} API = 7.0 " " "

4. Taken from SIECA "Annuario Estadisticos de Commercio Exterior: 1966-8"

	1964	1965	1966	1967	1968
Guatemala	19.5	24.0	27.0	22.5	
El Salvador	19.15	21.0	18.0	18.6	20.2
Nicaragua	34.50	27.7	20.0	20.2	19.1
Costa Rica				18.4	16.5
Panama		17.2	17.2	17.2	17.2

Crude prices (ave.) in $ per MT

The figures appear to confirm the general orders of magnitude though those for Guatemala and Nicaragua are particularly high, both over one and two year periods.

In addition to the crude oil directly converted there is also a demand for crude as fuel for the refinery which adds 5% to the cost[1] or about 90c per MT. There is also a small quantity of chemicals etc. required, such as caustic soda.[2]

electricity	3.7 KWh per barrel of crude
sulphuric acid	1.15 lb. " "
caustic soda	.21 lb. " "

If electricity (all have their own generators) costs 1.5c per KWh (average) and sulphuric acid $100 per MT cit, and caustic soda $70 per MT, then we can add another 10c per barrel and 75c per MT.

Therefore, we can assume that proportional costs are $19 per MT on the Atlantic and $20.5 per MT on the Pacific.

(b) Labour Costs

These are not 'proportional' but sufficiently small as not to be taken too seriously. A rough guide to manning is 100 men per 5,000 bd. capacity rising roughly to 400 men per 20,000/30,000 B/d capacity.

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1. The efficiency of a simple refinery is about 95%. Gaffney in "Techniques of Petroleum Development," op.cit. pp.

2. A. Manne: "Programming Data for the Petroleum Refining Industry." Industrialisation and Productivity Bulletin 10, (United Nations) p.66.

The Central American refineries seem to be somewhat more economic than this in their use of labour.

	Capacity	Men-employed	Annual Wage Bill
Puerto Barrios	12,000b.d.	64 workers (+7 senior staff)	$260,000 (6c per barrel)
Escuintla	14,000b.d.	87 people in 1965 declining to 60 incl. 45 manual workers	$225,000 (4.5c " ")
Acajutla	14,000b.d.	-	-
Managua	8,000 b.d. (expanding to 22,000)	100 people	est.(8.5c per barrel)
Costa Rica	8,000 b.d.	120 people	

Evidence is patchy but a rough estimate of 6c per barrel for labour seems reasonable enough. Though this ignores the economies of scale factor for labour, it is probably sufficiently small as to justify overlooking it.

(c) Investment Costs

This is probably the most important item as far as we are concerned, but also the most difficult to quantify. It is extremely difficult to establish a simple relationship between investment costs and refinery capacity because of the complexities of refineries and their ancillary functions. The factors that have to be established are several: the fixed investment cost (with construction, freight etc.) of the 'basic' units, distillation columns, reforming units, cracking units, to these, "battery" or "grass roots" costs must be added as necessary, but auxiliary equipment such as electricity generators, compressed air system, buildings, loading equipment, storage etc.; and finally, more complex refineries will have suplementary functions such as aromatic extraction units, lubricating oil and asphalt units, isomerisation, visbreaking etc.

As regards capital costs, there are several sources of information (Diag. 6).

Diagram 6

Refinery Size and Investment Cost

Size of Refinery	McLean + Haigh[1] (1950)	Garner[2] (1962)	Manne[4] (circa 1960)	Pratten[5] (1971) (a) Index	(b)	Shell[6] (1971) Index	Hubbard[3] (1962)
5,000 bd.	$12.5m.	-	$ 7.3m				$18m.
10,000 bd.	-	5 m.	10 m.			130	-
20,000 bd.	-	9.3 m.	15.5m.	100	100	100	-
30,000 bd.	25 m.	14 m.	-				-
40,000 bd.	-	16.5 m.	-	85	75	77	40m.
50,000 bd.	-	21.5 m.	27 m.				-
60,000 bd.	40 m.	25 m.	-				-
70,000 bd.	-		-				-
80,000 bd.	-		-			58	62m.
90,000 bd.	-		-				-
100,000 bd.	60 m.	39 m.	40 m;	66	56	53	-
120,000 bd.	-		-				80m.
150,000 bd.	-		-				-
200,000 bd.	110 m.		-	52	44		-
400,000 bd.	-		-		40		-
Scale Coefficient	.71	.80	.66	.66	.59	.57	.58

1. McLean & Haigh: "The Growth of Integrated Oil Companies" op.cit.

2. Garner in United Nations Seminar: "Techniques of Petroleum Development" op.cit. p.192.

3. Hubbard in " " " " " " " p.218.

4. A. Manne: "Programming Data for the Petroleum Refining Industry" in "Industrialisation and Productivity" Bulletin No. 10, pp.57-74.

5. C. Pratten: "Economies of Scale in Manufacturing Industry" op.cit. Ch.4, and Pratten and Deen "The Economies of Scale in British Industry (Introductory)" 1965.

6. *Shell Oil Company: unpublished estimates.*

Thus we have a considerable variety of assessments. This is not entirely unsurprising since the economies of scale factor will vary at different points along the size range. I have estimated in the range up to 100,000 bd., which is in the range of maximum economies. Also, the extent to which utilities are added will considerably affect the final result. Of the various estimates of scale coefficients, i.e. .7, .58, .66, .57, .66, the arithmetic average is .66. This is not a very scientific method of evaluating the scale function, but it does eliminate extreme results and bring us a figure close to those of the more reliable estimates, (e.g. Manne or the Cambridge Study).

Costs of investment vary by location, degree of over-valuation of currency and time, none of which can be allowed for systematically; and by refinery complexity.[1]

It is also useful to know the "minimum" size of refineries and the range over which economies of scale are felt. As regards the minimum size; simple distillation refineries have been built below 10,000 bd. Below 10,000 bd. is the so called "bantam class" refinery class. These are nowadays similar to large refineries, merely more compact. There have been extremely small refineries of this type - a transportable 1,000 bd. refinery of the US Navy, and a 1,000 bd. topping unit which has been established in

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1. There are various points here: (a) addition of a cracking unit of "normal" size is believed to raise the costs of a simple distillation refinery by 55% approx. (Pratten), 55-60% (Garner) or 100% (Hubbard). According to Manne, a catalytic cracker with the same charging capacity as the refinery would raise costs by 50%.
(b) A desulphurisation unit would vary greatly depending on the constitution of the crude, but the Cambridge study calculates on the basis of a 12% addition to costs.
(c) The difference between a "battery" unit and a complete refinery is obviously considerable. The Cambridge study says that 50% should be added for these auxiliary functions. Garner argues that for small refineries (10,000 bd.) the figure may be 60-70% of the total cost, falling to 30-40% in large refineries.
(d) The "developing country" cost penalty - additional transport costs mainly - could contribute about 20% on further costs in the more out of the way locations like Central America.

Israel.[1] In Guatemala there was established a 4,000 bd. plant, prefabricated in the USA; a topping unit, unifier, and catalytic reformer and storage. It was built for $5m. including housing etc. In a sense, these very small bantam refineries do have advantages - in maintenance for example - but in other senses they are clearly at a disadvantage. Though there are quite a few bantam class refineries, perhaps one of the smallest currently operating is the 3,000 bd. unit in Barbados.

Others that could so classified are:

Paraguay	5,000 bd. (being extended to 10,000 bd.)
Cambodia	10,000 bd.
Jordan	7,500 bd. (being extended to 15,000 bd.)
Guinea	10,000 bd.
Liberia	10,000 bd.
Sierra Leone	10,000 bd.
Martinique	11,000 bd.
Ethiopia	11,000 bd.

Bolivia has five very small local refineries (under 6,000 bd.) using local crude.

Generally, except in rare circumstances (Central American being one), refineries are not built below 10,000 bd.

The next stage is the lightweight zone - 10,000 to 30,000 bd. Most refineries in small developing countries are of this class.

The major economies of scale are in the 30,000 to 100,000 bd. range (middleweight) when catalytic crackers can be installed too. Above 100,000 bd. (heavyweight refineries) economies of scale are maximised, though they have been less popular.[2]

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1. M. Tanzer: "The Political Economy of Oil" op.cit.

2. Note that refining technology is not static. A fundamental change in design took place in the 1960's bringing refinery units more closely together. There has been a steady rise in both average and maximum refinery size over time and it is likely that this trend will continue. According to Pratten (p.34) there is an increasing supply of 200,000 bd. refineries because distillation units of that size are now being built. It is expected that 400,000 refineries will become more common though so far there are no economies of scale above 200,000 bd.

These general trends can be seen from the following distribution of refinery sizes - of new plants being planned and constructed in July, 1970 (in bd.).[1]

Size (in b.d.)		Numbers	
0-20,000	0-10,000)	none)	7
	10,000-20,000)	7)	
20-40,000	20,000-30,000)	4)	12
	30,000-40,000)	8)	
40-60,000			17
60-80,000			15
80-100,000			9
100-120,000			9
120,000-160,000			4
140-160,000			3
over 160,000			none

An attempt to assess an economies of scale functions was made using Manne's data, which should be feasible, as we know the Central American fixed investment costs and the dimensions of the local refineries. It might be felt that it is somewhat cavalier to assume away inflation in refinery investment costs over time. In fact, there has been virtually no inflation in refinery costs.[2]

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1. The median size is thus about 60,000 bd. and the most popular range is 40,000/60,000 bd. There are no true bantam references and 11 lightweight and 16 heavyweights. The other 50 are middleweight.

3. Investment cost indices from the monthly Oil and Gas Journal (1946 = 100)

	1954	1960	1967	1968	1969
Refinery inflation (index) cost	180	228	287	304	329
Construction & Design Productivity	1.71	2.21	2.77	2.82	3.18
Nelson (True Cost) Index	105	103	104	108	106

		Capacity	Predicted	Actual
Guatemala - Galvez	(i)	4,000 bd.	$ 6.0m	5.0m
	(ii)	13,000 bd.	12.0m (1)	10.6m
- Esquintla		9,500 bd.	11.5m (2)	9.0m
El Salvador		14,000 bd.	13.0m (3)	7.5m
Honduras		10,300 bd.	11.5m (4)	15.5/17.5m
Nicaragua		7,900 bd.	9.5m (5)	8.5m
Costa Rica		8,000 bd.	11.8m (6)	13.5/20m (?)

Though the general orders of magnitued are correct, there are some quite serious discrepancies and a tendency for 'actual' costs to be less than predicted. This should be due to the fact that "actual" investment costs can represent quite different things and a good deal depends on the accounting conventions employed in each case.

Because of this, it would not be sensible to construct an economies of scale relationship on the basis of local data. It is, therefore, done on the basis of a common function derived from Manne's 1960 data, with both a "high" and "low" estimate (20% less). The linearisation involves a straight line segment drawn as a least square linear regression line over the range in which there is a production possibility, i.e. up to 50,000 bd. Now this

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NOTES

(1) Includes a 2,800 bd. cat reformer.

(2) Includes a 3,300 cat. reformer in a 9,500 bd. plant. Data from Dept. of Economic Studies, Sector Externo Estadistico, 31st Dec. 1965 - deduced from data on overseas investment.

(3) Includes desulphurisation and 2,500 cat. reformer.

(4) Including 1,600 bd. cat. reformer. Two different estimates were given to the author by the government. There was some confusion about what could be included in the fixed costs (e.g. a gift of land from the government).

(5) Includes a 3,000 bd. cat. reformer.

(6) This plant is assessed on the basis of having a 1,200 bd. reformer and 3,000 bd. cracker. $13.5m was the official valuation of the refinery in 1968. Gulf are believed, however, to have paid $17m for an 85% stake (including goodwill; pipeline; stocks).

simplification does involve certain biases (in fact, it makes the "decentralised" solution less attractive). However, these can be corrected for later. The two solutions are:

$5.2m plus $600 per barrel/day (i.e. $12 per MT)
or $3.6m plus $500 per barrel/day ($10 per MT)

This has to be reduced to an annual charge of 25 to 30%.

Thus reasonable estimates of the annual capital charge are:[2]

$1.3m. + $3 per MT capacity
or $1.1m + $3 per MT capacity.

Demand

Demand projections and estimates have been discussed. However, we need to make several assumptions in calculating annual demand:

(a) that for the purpose of the exercise there is a uniform product- petroleum - and that there is no problem of particular product shortages. This assumes a fair deal about the flexibility of both crude and refinery, but is not unreasonable, given the assumption already made.[1]

(b) that demand is concentrated at a series of points. Clearly it is not, but it does not affect the overall result if fuel products have to pass through or are held in storage depots in the main cities before being dispersed to smaller distribution points. It is assumed that the cost of retailing and storage is independent of the configuration of the pattern of production.

(c) that demand is price inelastic. Again, this is not true entirely but it has to be remembered that especially with gasoline, small price changes in exrefinery cost are swamped by taxation changes anyway. And there is no substitute for gasoline for cars.

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1. The balancing of different markets with different supplies is another exercise of considerable significance: S. Wessells "Study of the Optimum Location for a refinery" in "Proceedings of the 2nd symposium on the Development of Petroleum Resources" UN Economic Commission for the Far East. Vol.2, 1963, pp347.

2. It seems reasonable to take 15% as a rate of return on risky equity and 7% on borrowed capital. With a gearing ratio slightly biased towards loan finance an overall rate of return of 10% seems reasonable. Then we assume a 10 year depreciation period. This would give effectively something like 20% pa. To this has to be added maintenance and repairs etc. adding perhaps 5% to the annual capital charge.

Diagram 7

Transportation Costs

From/to	Guatemala C.	San Salvador	San Pedro	Managua	San Jose	Tegucigalpa
Escuintla	4.0	7.0	12.0	10.0	8.0	14.0
Salvez	10.0	10.0	6.0	11.0	6.0	16.5
Acajutla	7.0	3.0	10.0	8.0	6.5	12.0
Puerto Cortez	12.0	9.0	4.5	12.0	5.5	11.0
Managua	13.0	12.0	15.5	-	10.5	15
Limon	9.0	8.0	6.5	9.0	3.5	15
Imports (incl. 20% tariff)	33.0	32.0	32.5	34.0	31.5	41.0

Notes

1. The cost of sea journeys purely on the Pacific or Atlantic side is estimated at $2 per ton between any pair of ports, not very apart; for longer journeys - say 1,000 kms. - assume $3 to $4. These figures were given by Esso Central America for coastal tanker costs. Import statistics (1965/6) seem to indicate transport costs (c.i.f. - f.o.b.) between Salvador and Costa Rica at about $4 per ton. To pass through the canal is a further $1 per ton.

2. The following road and rail haulage rates are available:

Data from SIECA Port Study op.cit

(Guatemala City from Port (San Jose)	$4.5 per ton (gasoline)	$6.75 (fuel oil)
(Escuintla from Port		$2.25 (crude oil)
(Escuintla to Guatemala City	$3.25 (gasoline)	$4.5 (fuel oil)
(Puerto Barrios to Guatemala City	$13.5 (gasoline)	$14.0 (fuel oil)

Puerto Cortes to San Pedro Sula — $4.5 (F.N.H. Figures - Railway Co.)
Acajutla to San Salvador — ($2.5 (F.E.S. Figures - Railway Co.)
($4.5 data from refinery.

P. Sonsa to Managua — $3.0 (crude) basic rates
Managua to Corinto — $6.0 (products)

Limon to San Jose — $3.6 (direct information)
$4.5 (F.E.P Railway Co.)

3. On some routes, land transit at 3c per ton km. is the cheapest form of transport; e.g. Tegucigalpa to San Pedro Sula; Acajutla to Guatemala City; Escuintla to San Salvador.

Transport

The key feature of transporting petroleum products is that there is a big disparity between land costs (pipeline, road, or rail) and sea costs as the companies make use of coastal tankers which do not need to berth in ports, but can discharge through short pipelines to waiting storage tanks. Thus, sea charges are very small, and this greatly reduces the 'economic distance' between markets. There is, however, negligible trade between countries (as opposed to within countries) and as such it is difficult to build up a reliable body of data. Table 7 gives an approximate estimate based on what was felt to be realistic matrix of probable costs based on information given by local oil distributors, railway companies etc.[1]

Results

Assumption I. The model was run first of all with the above transport costs that seemed most reasonable from the point of view of past experience. Secondly capital costs were based on the likely costs for a 'cracking refinery' and with fuel imported on the assumption that fuel imports at 25-30° API carry the same proportionate discount as 'heavier' crudes. Therefore, the capital cost function is $2,100,000 + $6.4 p.MT and fuel costs are $16.5 p.T (Atlantic) and $18 p.T (Pacific). There were seven markets and seven sources. A "separate" market is allocated to Tegucigalpa and to the Atlantic zone of Belice and Guatemala. The tariff was taken to be 20%

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1. There are various simplifications involved in this analysis: (i) rates differ for "clean" oils (paraffin, petrol etc.) and "dirty" products (fuel oil) the latter being more expensive to transport. (ii) except in the few cases where pipelines are actually used (crude oil lines from P. Somoza to Managua; San Jose to Escuintla) the possible advantage of pipelines for bulk transport is not seriously considered. If there were a large regional refinery it would undoubtedly be feasible to consider a major pipeline project along the isthmus. (iii) no systematic allowance has been made for the small, but not insignificant costs of loading and unloading; taking in and out of storage the various products for transport. See Part III; "Refining and Transport" in United Nations "Techniques of Petroleum Development" op.cit.

On the figures given, the optimal solution is a single refinery at Puerto Limon in Costa Rica supplying the entire region. Because of its location it obtains crude more cheaply and is able to supply the whole area with less transport costs than anywhere else. The 'overall' annual costs of $79.3m are $7.1m less than the present 'national' solution or 9% cheaper (i.e. about $3 per ton or 35c per barrel). This contrasts with some other results:-

best two locations	$80.0m	Nicaragua & Costa Rica
best three locations	$80.1m	" " " and San Salvador
best four locations	$82.6m	" " " " " and Guatemala (Pacific)
best five locations	$84.4m	all except Matias Galvez (Guatemala)

A three location solution would, in fact, have cost only a negligible 1.8% more than the optimum.

Note, however, that any other single refinery than Costa Rica[1] would have been much more uneconomic than six separate refineries, including the original idea of a single refinery in Acajutla - San Salvador. Thus the benefit of economies of scale are less than the differences in overall costs as between different locations of a single plant.

Assumption II. The model was then run for the same transport cost, but for a 'simple' refinery situation with capital costs at $1,300,000 + $3.7 per

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1. The situation of the Panamanian refinery in respect of location is similar to that of Costa Rica.

MT and fuel at £19 or £20.5 per ton. In this case the diseconomy of having a more 'decentralised' pattern is less great. The optimal solution is now a 'two refinery' solution, Costa Rica and Nicaragua, the latter serving only the Nicaragua market, and the cost of this (or the marginally more expensive single refinery at Costa Rica) is about 3% greater than the most 'decentralised' solution. In this case the optimum three location solution is about 1% greater. So there is little advantage to centralisation on these assumptions.

Assumption III. If the 'lower' estimate of capital cost is taken (i.e. £1.1m + £2m MT) then this further erodes the advantages of a regional refinery.

An increased estimate of transportation charges would have the same effect.

Assumption IV. It was anticipated that errors from linearisation might be significant. The following estimates were made of the difference between the capital costs used in the linear approximation C_1 and the capital cost read straight off the curve - C_2 (capital cost as in assumption II).

For 000001	$C_1 - C_2$	= 11.05 - 9.17	=	+ £1.88m
111111	$C_2 - C_2$	= 17.58 - 15.77	=	+ £1.78m
001011	$C_1 - C_2$	= 13.65 - 13.95	=	- £ .30m
100001	$C_1 - C_2$	= 12.35 - 13.80	=	- £1.45m
001001	$C_1 - C_2$	= 12.35 - 12.30	=	- £ .05m
010100	$C_1 - C_2$	= 12.35 - 13.95	=	- £1.60m.

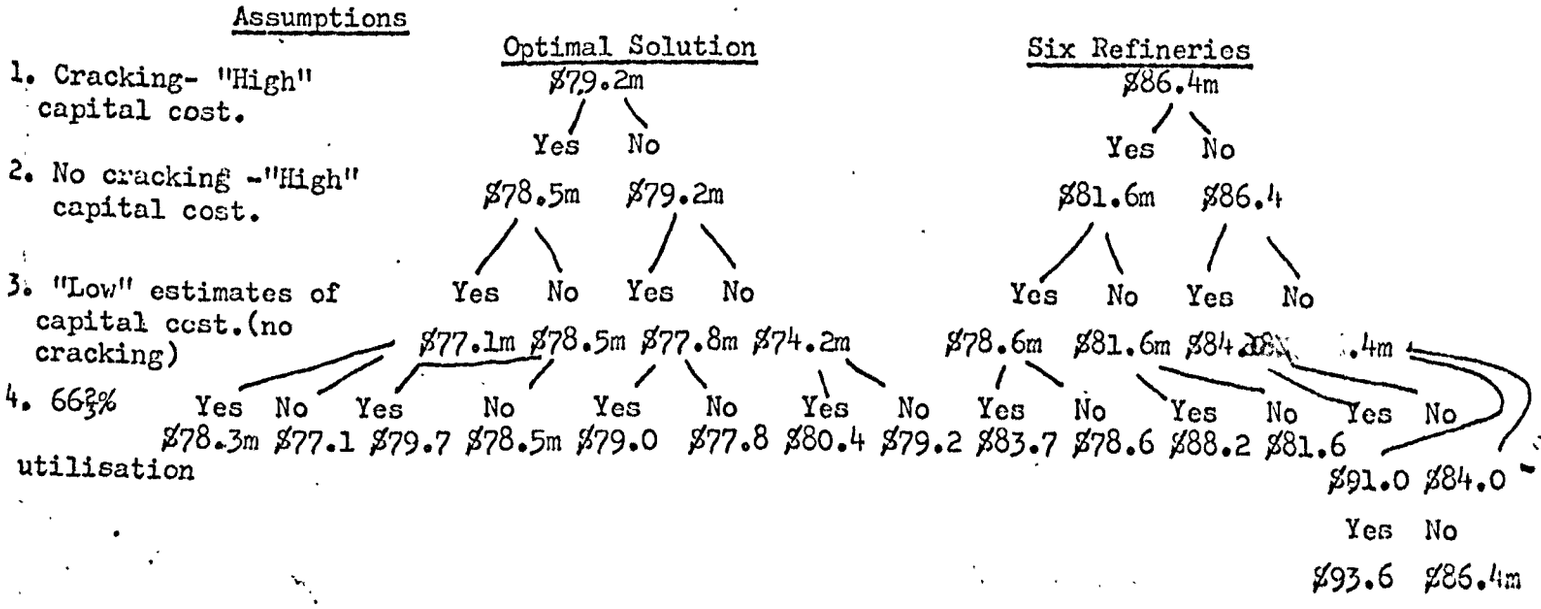
As expected, the effect of linearisation has been to 'inflate' the costs either of very large or very small plants while deflating the effect of two plants of about equal size at the point at which the difference between the arc and the line is greatest. Though the advantage of the single v. totally decentralised solution is no greater, there is less of a case for splitting into two or three refineries of equal size.

max. positive deviation

max. negative deviation

Assumption V. The effect of a 10% rather than a 20% tariff makes relatively little difference. The only major change is that small amounts of imports to the remoter locations become more attractive thus reducing the cost of some of the two or one plant solutions.

Assumptions VI. Capacity utilisation: hitherto, we have assumed that any plant established would be fully utilised. However, in practice because of the time phasing problem, and risk of breakdowns, factories would be built larger than the market with a corresponding increase in the importance of fixed capital charges. We took an assumption of one third of capacity under-utilised, linearised the economies of scale curves over a longer range, and as a result, the effect is to increase the attractiveness of centralised plant: These results can be compared by seeing the following table of annual costs.



% cost of actual over optimal	6.5%	1.9%	3%	3.8%	13.0%	8.5%	14.0%	7.5%

Thus, there is quite an array of possible savings depending on the assumptions made, but reasonable assumptions indicate a substantial positive savings.

The implications of the results are as follows. If we take the foreign exchange cost of the industry at about 75% of production costs and 100% of

crude transport costs then the region as a whole could save about $7m a year in foreign exchange from the "optimal" solution. On reasonable assumptions, if this gain were distributed in price reductions according to countries' markets then the annual saving would be:

Guatemala	=	$2.5 m.
El Salvador	=	$1.2 m.
Honduras	=	$1.65m.
Nicaragua	=	$1.2 m.
Costa Rica	=	$1.1 m.

However, there is also a loss of 'local value added' to local producers and a gain to those in Costa Rica, (compared with the 'national' solution)[2]:-

Guatemala	- $ .9m
El Salvador	- $ .45m
Honduras	- $ .5m
Nicaragua	- $ .45m
Costa Rica	+ $2.3m

If the assumptions are correct then there would be benefits to the industrial producers even without further adaptation, i.e. the gain in foreign exchange savings is greater than the loss in local value added. In order to make the scheme acceptable, however, Costa Rica would have to distribute some of its benefits in the form of reduced product prices, especially as local producer countries do seem to place some significance on the contribution which refining makes to their economies.

Time Phasing

Concern over small size has so far been largely directed at the fact that small refineries result in a wasteful establishment of capacity. If we look at the time dimension, the point to be noted is that with a regional

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1. There is no correction for linearisation error.

2. Ignoring multipliers, leakages etc.

market of 50,000 bd. refiners have already built a capacity to 80,000 bd. which should not be reached until 1975 at the earliest. The data was, therefore used in the dynamic model.

(a) as in the cement industry case we apply alternative discount rates of 15% and 10%.

(b) we take demand increments which represent straightline approximations to the curvilinear growth of demand are (in MT per year):

	"Low"	"High"
Guatemala (N)	7,000	10,000
Guatemala (S)	38,000	57,000
Honduras (N)	10,000	15,750
Honduras (S)	70,500	15,750
El Salvador	20,000	30,000
Nicaragua	20,000	31,500
Costa Rica	7,500	15,750

(c) for the investment cost function we took what was the most reliable data source, Manne, (i). For contrast, the model was also run on a very high investment cost assumption, using Hubbard's data (ii), and a very low one, using Garner's data (iii).

In addition there are the annual charges; spares, maintenance, etc., adding 4% a year. Labour is not an important element of cost but on the basis of previous figures it accounts for something like 3.0% of investment costs at 10,000 bd. and we could reasonably assume that this relationship is maintained over the ranges we are considering. Thus, 7% of the investment cost needs to be discounted at 10% to infinity, which is equivalent to 70% of the investment costs. If we take a replacement factor of 15% which would be necessitated by a $12\frac{1}{2}$ year depreciation period, then we need to add in total 85% to the investment costs. Therefore, the cost functions are:

$$\text{(i)} \quad \log I = 7{,}845 \, (\log c)^{.61}$$

$$\text{(ii)} \quad \log I = 12{,}780 \, (\log c)^{.6}$$

$$\text{(iii)} \quad \log I = 1{,}740 \, (\log c)^{.72}$$

Above 400,000 T.p.a. the curve is linear.

As in the cement case, we assume that every other extension to capacity is of the form of a new distilling column rather than a new refinery and this saves 25% of the cost.

Results

(1) If we take initially the investment function (i), a discount rate of 10% and the best ordering combination (2 5 4 3 6 1) we get the following (in £m):

Open solution (plus cost of crude oil)		Closed
Terminal value	129.46	153.2
of which investment costs	66.73	104.6
" " transport costs	62.73	48.6
plus crude oil costs	280.00	280.0

Optimum time cycles are:

	'Open' Solution			'Closed' "national" solution		
	cycle	start	Size (Tpa)	cycle	start	size
Location 1	24 yrs.	Yr. 1	912,000	6yrs	Yr. 1	228,000
2	24 "	23	168,000	6 "	1	42,000
3	24 "	13	480,000	6 "	1	120,000
4	24 "	17	504,000	6 "	1	126,000
5	12 "	6	372,000	6 "	1	186,000
6	24 "	10	509,000	6 "	1	126,000

There are considerable advantages to be derived from a planning approach. Optimum time cycles are considerably lengthened to permit economies of scale. However, the effect of unalterable crude oil costs is to restrict the saving to about 5% of the total cost, c.i.f. delivery point, or 15-20c. per barrel. However, even this is a substantial saving.

(2) If we experiment with different combinations of locations this has little effect, the following different estimates were obtained for the "open solution".

	Terminal Values	of which Investment Cost
1 2 3 4 5 6	129.8	(68.9)
6 5 4 3 2 1	131.2	(66.4)
4 3 6 5 1 2	132.5	(68.05)
2 5 4 3 6 1	129.465	(68.7)
5 1 3 6 4 2	139.25	(76.5)
3 6 1 2 4 5	133.65	(69.2)

The spread is quite significant and no doubt one could get, after exhaustive testing, a better solution than the optimum indicated.

(3) If we take a higher investment cost function (ii), then the total terminal costs are:

	"Open"	"Closed"
1 2 3 4 5	180.0 (investment costs (127.0)	222.0
5 4 3 2 1	182.2 (investment costs (126.2)	
4 3 6 5 2	182.2 (investment costs (132.5)	

The savings over the closed solution are now greater, significantly, than before - almost 10% of the total cost including crude price; again with 24 year cycles replacing 6 year cycles.

(4) If we take a lower investment cost function, (iii) then we have:

	Open	Closed
1 2 3 4 5	137.6 (investment cost 85.0)	144.4 (investment cost 96.8)
5 4 3 2 1	141.4	
4 3 6 5 2	138.5	

In this case, savings are much less than in the first one; about 2.5% of the total; due to the limited scope for economies of scale.

It is clear, therefore, that the choice of data chosen is very significant in affecting the ultimate result. The function (i) seemed most reasonable in the light of our knowledge of the region but the solution is subject to a considerable degree of error.

Another variant is to consider the variation of the discount rate. This should make a decentralised pattern of production less attractive than the total capacity installed in the first three years needs to be slightly more than in the "closed" system; and the effect of introducing a 15% discount rate is to give returns in the immediate future a higher weighting. In fact, the difference is not greatly significant.

Concluding Note: Petrochemical Opportunities Foregone

The construction of six local refineries which are extremely simple in technology has prevented the emergence of a petrochemical industry in Central America based on local feedstock. In so doing it has foregone not only the direct benefits of import-substitution, but the whole range of "external economies" and linkage effects that can be obtained from petro-chemical "complex" development.[1] If we take demand for the main products which have, or could have, a petro-chemical base - ammonia, polyethylene, P.V.C., artificial fibres - then we estimate that there is a potential derived demand, in 1967, for basic petro-chemical feedstock (reducing to naptha equivalents) of 200,000 to 300,000 tons p.a. This would add about 10,000 bd. crude charge requirements to necessary refining capacity which is 50,000 bd. today and could be 75,000 bd. in 1975.

It is estimated that 40,000/50,000 bd. is the minimum size for a refinery which is contemplating petro-chemicals production. This could be reduced to 20,000 bd. in unusual circumstances. The main constraint is that a cracking unit is required and these have a minimum size and considerable economies of scale. The present 8,000 bd. Costa Rican refinery with a 3,000 bd. catalytic cracker is held to be wasteful in the extreme. Therefore, two refineries with a minimum size of 25,000 bd. each would seem to be the most we could entertain on a Central American plane and present autarchic policy has stifled this industry.

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