1999

An inquiry into changing industrial labour force patterns: Developed and developing countries

Kimberley Birjis Naqvi
Wilfrid Laurier University

INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

UMI®

Bell & Howell Information and Learning
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA
800-521-0600

An Inquiry into Changing Industrial Labour Force Patterns: Developed and Developing Countries

by

Kimberley Birjis Naqvi
BSc, University of Regina, 1984
M.A. Wilfrid Laurier University, 1986

Thesis

Submitted to the Department of Geography and Environmental Studies
in partial fulfilment of the requirements for the degree of
Doctor of Philosophy

Wilfrid Laurier University

1999

ABSTRACT

Structural transformation patterns are examined to search for a systematic breakdown in the historical relationship between rising GDP and rising industrial labour force shares. Some older industrialised countries have considered focusing on knowledge and skill intensive activity as a new 'engine of growth' in response to industrial employment decline, and stagnating incomes. Such new economic activity anticipates trade with industrialising countries, whose incomes would rise with industrialisation.

This relationship is dependent on the persistence of labour-intensive specialisation in industrialising countries. Three trends might prevent prolonged specialisation: increased international competitiveness, rising capital-intensity in production, and international economic specialisation. Each of these is hypothesised to reduce new industrial labour force sizes and pay, thus reducing demand, and the multiplier effects of industrial activity.

An examination of international industrial labour force levels, industrial GDP share, and GDP per capita over time indicates that industrial labour forces are smaller over time, and receive proportionally less of the income produced by this sector. Instead, labour in industrialising countries enters the service sector, whose GDP share is declining. A specific comparison of older industrial countries with newer post-industrial (deindustrialising) countries indicates that the industrial experience of the older industrial countries may have been unique, and that the role of industry in national and personal income growth is changing.

ACKNOWLEDGEMENTS

Many thanks to my advisor, Dr. Alfred Hecht, who was patient, encouraging, and a source of clarity during a complex and sometimes overwhelming process. My other committee members, Drs. Bob Sharp, Paul Parker, and Frank Millerd, also ensured that a richer work was produced with their enthusiasm, their assistance with some the finer points of economic language, and their pressure to more explicitly state the implication's of the results and address the fundamental theoretical problems currently plaguing development studies. The additional input of Glen Norcliff, the external reader, will also greatly influence the refinement and direction of further work.

Wilfrid Laurier University as an institution has been supportive, especially during the two first critical years. I am particularly grateful for the opportunity to teach within the field of development studies, the first four months of which taught me more than the previous three years of study.

I owe much to my all family (in every way), especially my father, who insisted I work primarily on my studies until I was done. Lynn Weir has been a great source of moral support, as were and are the rest of my former co-workers at the Bahá'í National Centre and the Geography Common Room Regulars. Finally, Sharron FitzGerald took time to edit the first chapter for me, adding her voice to the chorus of 'no more long, convoluted sentences'. She has thus aided myself and others, immensely.

TABLE OF CONTENTS

List of Tables

List of Figures

CHAPTER 1

NEW GLOBAL TRENDS AFFECTING INDUSTRIALISATION: IMPLICATIONS FOR DEVELOPMENT THEORY

Industrialisation was seen as the basis of economic growth in nineteenth and early twentieth century Europe, North America, Australia, and New Zealand, and is still seen as central to development theory and practice (ex: World Bank, 1997a, introduction; Adelman and Morris, 1997). Therefore, changes in industrial processes have significant implications for assumptions about the overall social and economic spin-offs from the structural transformation from an agrarian to an industrial society.

With this concern in mind, this study compares the industrial patterns of older industrialised countries (OICs), newly industrialised countries (NICs), semi-industrialised countries (SICs), and less industrialised countries (LICs)[1] to see if earlier patterns of structural transformation are being replicated. It questions the possibility of replicating the large, fairly well-paid, industrial labour force once typical of the OICs. Such a replication is based on predictions of prolonged international economic specialisation. Older industrialised countries are expected to emerge as leaders in high-technology, knowledge-intensive industry and services (OECD, 1991, 1992), while labour-intensive

---

1 Throughout this dissertation, the terms 'less industrialised', 'newly industrialised', semi-industrialised and 'older industrialised' are used to distinguish between various degrees of social and economic development. While focusing on industry may be seen as a reversion to more economic definitions of development, the term is used to avoid making assumptions about the ideal nature of true development. The definitions for OIC, NIC, SIC, and LIC in this study are based on sectoral labour force distribution and are defined in Chapter 5. OICs and NICs have (or have had) over 30% of the labour force in industry, and under 35% in agriculture, while SICs have over 10% of the labour force in industry and under 60% in agriculture. LICs comprise the remaining countries and generally have over 60% of the labour force in agriculture and under 10% in industry.

activity develops in LICs over several decades (*The Economist*, 7 October 1994). Under such international specialisation, industrial activity persists allowing the emergence of a well-paid labour force, and fostering encouraging further structural transformation.

Since the 1980s, there has been an increase in industrial activity and export-led growth in several less industrialised countries (see Helleiner, 1992; 1994; 1995, IMF 1997; Streeten, 1997 for overviews). Trade, finance, and labour deregulation, plus new technology in transportation, production, and communication has further enabled the international spread of production (Malecki, 1991; Dicken, 1998); notably, much textile, clothing, and heavy industry has shifted from OICs to parts of east and south Asia and Latin America . Countries[1] like Malaysia, Thailand, and Indonesia adopted labour-intensive, export-led manufacturing in the mid-eighties hoping it would be a more effective means of replicating OIC structural transformation than the capital-intensive import-substitution approach. Instead of trying to replace high-cost imports from industrialised economies, industrialising countries followed the strategies of Korea, Taiwan, Singapore, Hong Kong, and Japan, and competed against relatively high-cost production in OIC markets. However, changes in technology and economic regulation have also meant that late twentieth century industry is radically different that of the nineteenth and early twentieth centuries in which industrialisation was seen as the 'engine of growth' which transformed productivity levels, social relationships, and labour incomes. In the view of the regulation school, in particular (Aglietta, 1979, 1998, amongst others), the new social and economic phenomenon of waged, industrial labour,

---

1 The term 'countries' is not synonymous here with nation-state, but politically and geographically distinct entities, which are able to govern most economic decisions affecting their population and resources.

governed by institutional arrangements, allowed mass production and mass consumption. Increases in individuals' participation in social and economic life became possible with higher incomes and the greater availability of goods and services.

This study hypothesises that three trends, 1) rapidly changing production processes, 2) the international organisation of production, and 3) increased international competition will promote the replacement of labour-intensive activity by capital-intensive activity in LICs, SICs, and NICs, before the industrial labour size and incomes reach levels achieved in the OICs. These three trends approximate those identified by Dicken (1998: 436-438) and are discussed more fully in Section IV. The implications of such change are that the industrial labour force will both be smaller and lower-paid, with less of an impact on social change in general.

I. Recent Concerns in Development Research and Theory

This particular hypothesis addresses two perceived gaps arising from the current literature debating future development theory and practice. First, the recent focus of much literature is not on the potential impact of technology and global integration on industry in any development process, but is still on either the *means of industrialising* or the relative *social and cultural merit of industry and modernisation* in general. With respect to the means of industrialising, the focus in OICs has been on economic and social *restructuring* around new technology and production systems, including their institutional support systems (ex: Porter, 1990; Science Council of Canada, 1990; OECD, 1991; 1992; Foray, 1993; Economist, 1994; Amin, 1994; World Bank, 1998a). For most of the rest of the world, largely comprising LICs, the predominant focus has been on

structural adjustment, or the opening up and integration of national economies into an emerging global system (ex: Krueger, 1978; Bhagwati, 1978, 1988; Williamson, 1997). In most cases, the social ramifications of changing industrial processes on LICs are not considered.

A third stream of development literature, in addition to the restructuring and structural adjustment schools, challenges the assumptions that modernisation and industrialisation equal development (ex: Sachs, 1992; Daly and Cobb, 1994; Escobar, 1995; Crush, 1995; Cooper and Packard, 1997; Rist, 1997; Esteva and Prakash, 1998). Strictly speaking, all are radical in the sense that they reject the roots of industrialisation-centred modernisation and development; some specifically target classically defined factors of production (ex: Daly and Cobb, 1994; Escobar, 1995). However, not all are as politically radical as others, in the sense of rejecting reform from within existing institutional structures. Nederveen Pieterse (1998) argues that there is increasing convergence between alternative and mainstream views. Human-centred and institutional development are the subjects of the United Nations Development Programmes's *Human Development Reports* (UNDP 1990-1998), and this shift of focus is now even promoted within the World Bank (ex: Wolfensohn, 1998).

Early modernisation and development theory did, in fact, recognise the importance of institutions, but generally saw them as another tool of industrialisation (Kuznets, 1957; Gilles et al, 1992). What has changed over the decades is 1) the increasing recognition of cultural and geographic diversity, which affects perceptions of appropriate and possible development, and 2) increasing frustration with development practice, which, while ostensibly for the good of the people, generally excluded them from any

decision-making processes. In some cases, more authoritarian stages of government control were advocated to effect major social change (ex: Hoselitz, 1952). At the level of human development, early theory focused on identifying entrepreneurial individuals or classes. Tradition and culture, social relations, and institutions were generally seen as obstacles to development.

The limitations of these early visions of institutional and human actors in development are now broadly recognised. Support of these alternative approaches from older institutions, such as the World Bank or the United Nations, are still viewed with suspicion given their past record (Escobar, 1995; Corbridge, 1998). Whether or not such policy shifts express fundamental changes in approach, there is a perceived need to move beyond the rhetoric of people-centred development, into policy and application (Nederveen Pieterse, 1998). To this end, by providing more concrete evidence of changing industrial patterns, this study hopes to help strengthen the case for focused institutional and human development, on the basis that industry can be seen to have lost some of its perceived potential as a force of social change (however much that potential may have always been challenged by a minority of theorists).

A second concern, arising from the development literature, concerns evidence of industrial change, particularly changes in the process of structural transformation. Changes to OIC industry and to the worldwide distribution of production are certainly acknowledged, and are the topic of much new policy debate. There is less focus on the possible impact of *systemic* change to the structural transformation process. Where there is mention, abstract consideration of its possible effects exceeds the number of empirical studies, and therefore, there is little statistical evidence to back up concerns. Concerns

about changing growth patterns are often answered by the legitimate, but limited, observation that it is better than no growth (ex: Ravillion, 1997). Critical or 'radical' approaches to development have more often, and more generally considered that changes to industrial processes will affect industrial patterns in LICs, SICs, and NICs, (ex: Knox and Agnew, 1994; Clark and Kim, 1995; Porter and Sheppard, 1998). They are increasingly joined by those, who, while hardly 'mainstream' (if by mainstream is meant neo-classical), are more influential in development practice and policy formulation (ex: Emmerij, 1997; Streeten, 1997; World Bank, 1998). This dissertation thus measures and compares structural transformation patterns over time and over a broad range on countries, in order to provide evidence of changing patterns.

While the focus of this study thesis is the role of industry in development in the light of industrial change, its scope is limited to two main goals. First the limits of the existing literature in addressing the implications of industrial change for industrialising countries are identified. Second, evidence of the effects of industrial change in industrialising countries is gathered, in response to existing speculation about future patterns. Possible implications of the results are briefly discussed in the final chapter. This study does not attempt to develop a reinterpretation of development theory or the history of industrialisation and patterns of sectoral change, based on these preliminary results. The implications of the identified changes for development theory and historical analysis are seen as separate projects in themselves.

II. Rationale for the Study

A. The Implications of Industrial Change for the Regulation School

So far, attention has been drawn to the general streams of development thought in literature, the gap between OIC and LIC research agendas and policies, and the relative shortage of research on industrial restructuring and the LICs (although see: *International Development Studies Bulletin*, 1992; Humphrey, 1995a). Concern about the identified global trends of rising capital-intensity, international economic integration, and increasing competition, are systematically addressed, however, in a large body of literature on OIC economic restructuring. To reiterate, the general hypothesis of this study is that greater capital-intensity, greater international specialisation, and greater pressures for aggressive competition will accelerate the emergence of capital-intensive industrialisation, and limit industrial labour force size and pay in successive NICs. The rationale for the study is that changes to the industrial process also change the social and institutional bases for widespread wealth distribution which existed in the OICs. Widespread wealth generation and distribution, then, will not necessarily be replicated in industrialising countries, without specific efforts to redefine social and economic relations within a changing economic system.

The regulation school's interpretation of economic organisation (ex: Aglietta, 1977, 1998; Lipietz, 1987; Boyer, 1988, 1990) provides useful tools for comparison and exploration of the implications of these differences. Though the regulation school has conceptual limitations regarding its ability to define states and other institutions, and to identify processes of change (Boyer, 1990; Hay, 1995; Tickell and Peck, 1992) it is useful as an evaluative tool (Tickell and Peck, 1995). Its observation that the state and social

institutions long had an integral role in modern industrial development demands that changes to either the economic system, or social and institutional structures, cannot be considered in isolation (Tickell and Peck, 1995). Thus, the social implications of changing capital-intensity, international relations, and intensity of competition are inseparable from any effect on profit.

According to Aglietta (1998), the regulation school was always a research programme, rather than a defined body of ideas. Its approach was minimalist, with respect to institutional interpretation, concerned with recognising macro-economic patterns, rather than identifying detailed institutional processes. In keeping with this minimalist approach, and the constraints of an inter-country analysis of human relations and institutions, this study addresses institutional and social development issues indirectly. It attempts to identify a measurable shift in structural transformation patterns, and the absence of the historical pay-employment relations of early OICs in the emerging NIC and SIC contexts. Implications of the absence of similar social relations, are discussed in the analysis and concluding chapters, along with possible means of increasing the social and institutional content of the analysis at the inter-country level.

B. An Overview of the Regulation School

According to the regulation school, the OIC's mixed-market economic systems (referred to as 'capitalism' in regulation theory) balanced production, consumption, incomes, and distribution[1] through a system of social norms and regulations[2]. Systems of

---

1 In regulation theory, the system of production, consumption, income determination, and distribution is called the 'regime of accumulation'.

2 The regulation school uses the phrase 'mode of social regulation'.

production and consumption are largely determined by the actions of firms and entrepreneurs, and have limited durations. This is due to the limited growth potential of specific technical and social systems, and the constant tension between the need for growth and the need for social stability. Market-based economies must constantly adjust through a combination of technical, institutional, and social change.

According to regulation theorists (and other restructuring schools, such as flexible specialisation theories and the techno-economic paradigm), a widespread 'Fordist' system of mass production and mass consumption has been declining since the late 1960s. Rising incomes, rising consumption, and rapid economic growth rates led to market saturation and high production costs. These, in turn, affected international industrialisation when new markets and lower production costs were sought outside of OIC borders. Since the late 1960s, the Fordist system has experienced slowing productivity, market saturation, and worker dissatisfaction resulting in conflict and higher wages and other demands. The combination of market saturation and higher labour costs led to declining profits, to which there were two responses from industry: new markets and lower wage costs were pursued simultaneously.

Both were achieved through the exporting of products and of production; through diversifying products through flexible, capital-intensive production techniques; and through otherwise re-organising production to externalise services and reduce management and labour costs. As a result, since the early 1970s, there has been increasing polarisation of the OIC workforce associated with growing demands for higher-skilled workers, loss of demand for semi-skilled workers and full-time, and increased demand for low skilled and part-time or temporary workers (OECD, 1994; Minford et al, 1997). This

pattern is summarised in almost every general work on the regulation school (see Amin, 1994a and Esser and Hirsch, 1994 for overviews).

With increasing emphasis on capital-intensive and knowledge-intensive activity as the new source of growth in OICs, there is then incentive for NICs, pressured by competition from emerging SICs and LICs, to move quickly to capital-intensive production. Labour force patterns in the NICs and SICs thus may change more rapidly than they did for the OICs. Worldwide labour, as a whole, is faced with the political incongruity of national regulation systems for international production, and the economic incongruity of industrial regulations which were designed for labour-intensive mass production, when it is capital-intensive production which is rising.

While the exact nature of any new world economic system is still debated, some commonly identifiable production features, are: the rise of international specialisation, increasing international trade, increasing capital-intensity in production, rapid process and product changes associated with new technology, and specialised demand from smaller niche markets. Of particular interest to this study is the social impact of such forms of industrialisation in industrialising countries while the system of social regulation is being dismantled in OICs. The international specialisation, rapid technical change, and resulting aggressive competition characterising OICs all promote rapid change and flexibility, rather than stability, in economic and social relations. On the whole, LICs and NICs may either be pushed into adopting similar strategies to maintain levels of growth, or be locked into the low end of production activities, specialising in labour-intensive activity, with largely external linkages (World Bank, 1995a).

III. New Trends Affecting Industrialisation

In general, the study hypothesises that the relationship of sectoral pay and sectoral labour force share will be different in the NICs and LICs (less industrialised countries) than in the OICs at similar stages. More specifically, it hypothesises that peak industrial labour forces share in NICs and SICs will be smaller, decline in size more quickly than they did in the OICs, be less well-paid, and that their growth will be less strongly correlated to rising GDP per capita.

Comparisons of labour forces over time are made by 1) measuring the size of the industrial labour force, and its correlation to GDP per capita growth, and 2) comparing the ratio of sectoral labour force to sectoral GDP share as a means of estimating pay levels by sector. Sectoral labour force share and sectoral pay are chosen as primary indicators of change, because waged labour, and its rising demands for products, played a major role in the general distribution of wealth in the OICs. Fisher's (1939) and Clark's (1940) simple, three-sector classification of agriculture, industry, and services is adopted. Although manufacturing is the critical sub-sector of industry with respect to dynamic change, data are more readily available for a large sample for industry. Some limits are imposed by this simplification, but the international coverage of data is broadened. Specific differences in labour force size, sectoral labour force share, and income levels are hypothesised to emerge in industrialising countries as a result of several new trends affecting modern industrialisation. While these trends can be enumerated in several ways (ex: Emmerij, 1997b), they are simplified here to three, and approximate Dicken (1998: 436-438).

1. Increased capital-intensity in production methods,

2. International economic specialisation, and
3. new sources of competition, including earlier competition from LICs, and continued competition from OICs, which are enabled by further technical change.

It is widely hypothesised that the OICs changed from predominantly agricultural economies to urban, industrial economies in a series of steps or stages (Fourastie, 1939; Rostow, 1960), though not without national variations. A critical stage in this process was the creation of a large industrial workforce, whose rising consumption helped increase growth, and whose social stability contributed to industrial and economic stability. Replication of similarly sized industrial and service workforces in industrialising countries is tested by the examination of cross-sectional data and time-series data of sectoral labour force share, GDP per capita, and sectoral GDP share.

Divergence between NICs and OICs in sectoral labour share patterns during structural transformation was apparent as early as the 1950s (Kuznets, 1957; Baer and Herve, 1966; Bairoch and Limbor, 1968; Pandit, 1987, Weiczorec, 1995). The stability of the structural transformation process is still generally maintained by many researchers on the basis of the strong relationship between a shift out of agriculture and a rise in GDP per capita (Syrquin and Chenery, 1989; Syrquin, 1994).

As noted above, the response of some OIC administrators and analysts has been to emphasise specialisation in knowledge and skill-intensive activities for the global market. This is not to say that a majority of employment would necessarily be in those activities, but that export-led activity in knowledge-intensive and skill-intensive services and manufacturing would be the new 'engine of growth' for the OICs. The assumption, implicit or explicit, is that knowledge and skill-intensive activity in NICs and SICs will remain relatively low, while their demand for knowledge-intensive imports rises, at least

in the immediate future (Economist, 1994).

IV. Potential Effect of New Trends on Late Twentieth Century Industrialisation

Since specialisation in knowledge and skill intensive activity is dependent upon protracted specialisation, a shift in the rate of structural transformation, that is to say, the time taken to shift from agrarian, to industrial, then to service dominated employment, becomes important. But the simple logic of this projected international specialisation is challenged by the same three trends which changed OIC industrial production in the first place, namely, greater competition, increasing economic integration, increasing capital-intensity. They are examined here in turn for their potential effects on industrial patterns in industrialising countries, and possible measures for these effects (table 1-1). Note that while the study measures changes in industry only at the level of the three major sectors, effects on knowledge-intensive sub-sectors are also hypothesised. Only the effects of increased capital-intensity and competition can be tested directly with the data available. New competition is expected to have effects similar to increased capital-intensity on industrial labour force share. Further evidence of the effects of increased capital-intensity could be obtained by examining changing trade composition its contribution to GDP, but is left for future research.

Data for sub-sectors of service and manufacturing activity are also less readily available, and confined to a narrower range of countries, and a shorter time-span. This is due to the difficulties of gathering detailed country data through survey methods. Detailed and historical information is therefore biased to the OICs, and older NICs, making testing of the specific hypothesis of interest difficult.

Table 1-1 Hypothesised Effect of Global Trends on Successively Industrialising Countries

TREND	HYPOTHESISED RESULTS	POSSIBLE MEASURES	USED
Increased Capital-Intensity in Production	- smaller industrial labour force - larger service labour force - divergent skill demands (low or high only, no mid-range) - lower incomes - lower demand - lower multiplier effect	- labour force share - GDP per capita (as income proxy) - sectoral GDP share versus labour force share (measure of labour - intensity, and incomes)	yes yes yes
International Economic Specialisation	- fewer linkages local linkages - less local skill and knowledge transfer with foreign ownership - lower salaries - smaller industrial labour force	- GDP share / labour force share - GDP per capita (proxy for income) - trade content of exports and imports - import origin - export destination	yes no no no
Labour-cost Based Competition from NICs and Capital-Intensive Competition From OIC	- earlier loss of labour-intensive production - earlier rise of knowledge and skill-intensive activity while total labour force participation is still relatively low - earlier reversal of industrial labour force growth and associated income	- labour force size - sector size - changes in trade content and volume - changes in export destination by sector - changes in import origin by sector - income disparity - unemployment	yes yes no no no no no

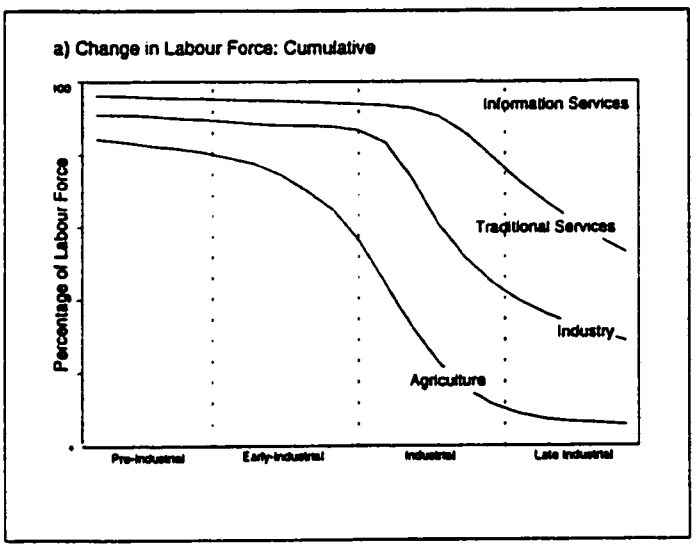
With respect to changes in industrial technology itself, it is important to note that changes in industrial processes may cause only *relative* changes in the impact of industrialisation, not a total absence of income and employment generation, or even of entrepreneurial activity and innovation. Other influences, such as government policy, industrial policy, corporate practice, and culturally-specific responses also alter the social effects of industrialisation. It is necessary to assess the *relative* difference in the impact of current industrialisation compared to early industrialisation, not merely its growth potential compared to existing traditional activity. The Clark-Fisher hypothesis (Fisher, 1939; Clark, 1940) of structural transformation patterns for labour force and GDP per capita is used as a basis for comparing measured differences between OICs and other countries. The hypothesised changes are graphed in figure 1-1, which is based on Abler's (1975) diagrammatic version of the Fisher-Clark hypothesis.

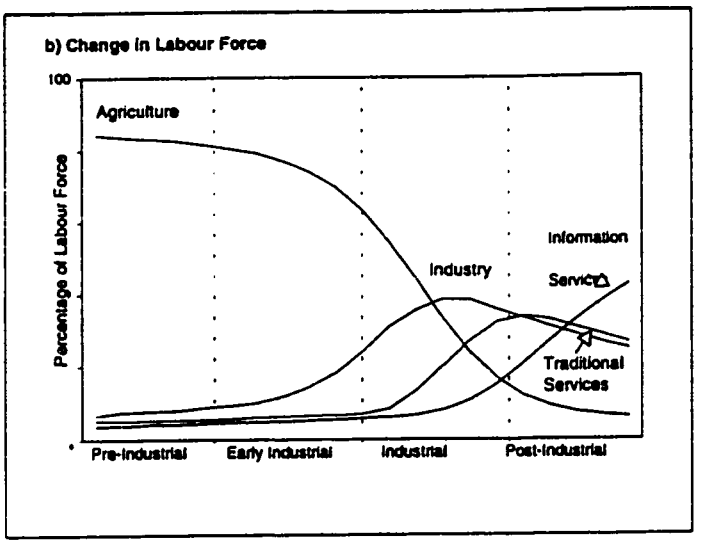
The hypothesised effects of the global trends are that:

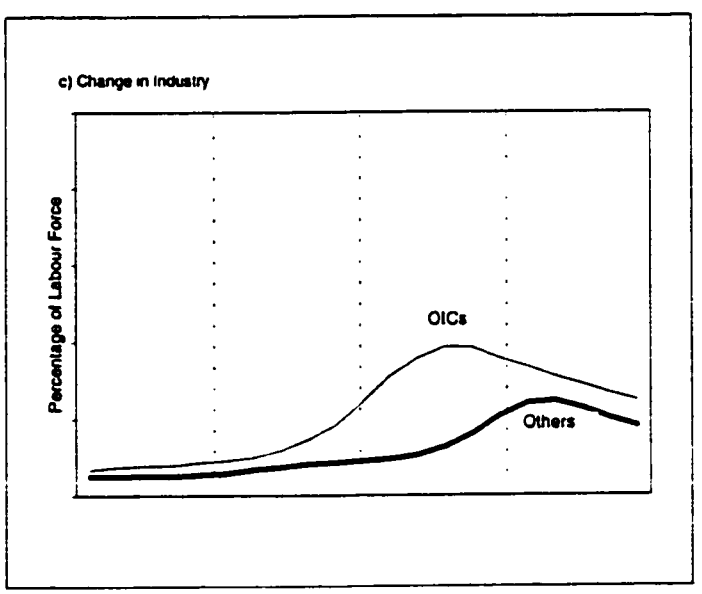
1) successively industrialising countries will have industrial labour forces which will both grow to a peak and decline more quickly, with smaller maximum share sizes, and lower pay (figure 1-1c),
2) have service sectors which emerge sooner, and comprise a larger share of the labour force, especially in traditional services (figure 1-1d), and
3) have knowledge-intensive activity at earlier stages (figure 1-1e).

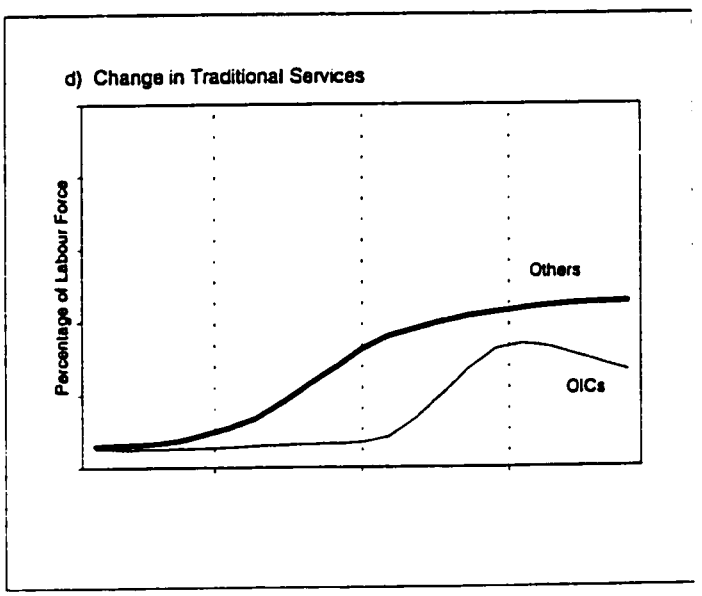
The first two patterns are the result of increasing capital-intensity, which will emerge earlier in NICs and SICs, and international economic specialisation, which reduces the relative number of national linkages. Evidence of increased capital-intensity has been previously cited. International specialisation lowers industrial labour force size, relative to OIC experience, because each independent enterprise's efforts are more likely to be externally focused with fewer local linkages, while branch plants are, by their nature,

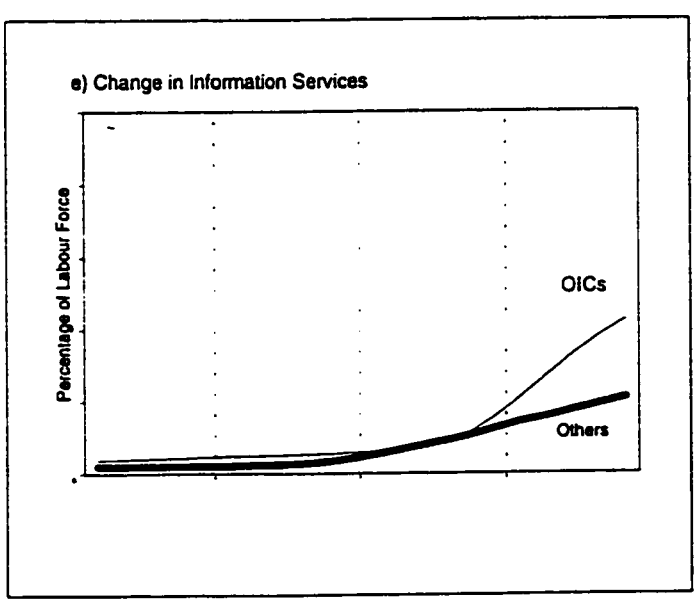
Figure 1-1 Hypothesised Patterns of Sectoral Labour Distribution over Time and Relative to Income Change











Source: Original Model (a) from Gould (1975).

more tightly linked to an international structure. Technology transfer to branch plants does occur, but is known to be lower than in parent companies, as are local research and development activity (Dicken, 1998; Porter and Sheppard, 1998). A complete absence of local linkages and technology and skill transfer is not expected; it is the relative regional impact of late industrialisation which is being measured. Finally, competition from both restructuring OICs, and industrialising LICs, places pressure on NICs and SICs to make a more rapid transition to capital-intensive activity than labour-supply and skill levels might have otherwise warranted. In fact, several authors have speculated on the relative role of such LIC competition, especially from China, on the recent financial crisis originating in South East Asia (Bergson, 1997; Fernald et al, 1997; World Bank, 1998b).

V. Notes on the Recent Crises in the International Economy

The three trends identified, and their hypothesised effects on industrialising countries, all reflect observations made between the early 1980s to 1997 about the impact of rapid industrialisation in Asian NICs, and their potential to sustain their growth in the face of international competition (ex: IMF, 1997). Since July 1997, however, interpreting the impact of growth and change in the Asian NICs has taken a back seat to the current financial and economic crisis. Precipitated by the flotation and devaluation of the Thai baht, a rapid exodus of investment funds from Asian, and now some Latin American NICs and SICs, has led to stringent financial and structural reform packages from the International Monetary Fund (IMF) in exchange for massive loans.

Few, if any, can claim to have predicted the sudden, and apparently extended downturn. Several economists (ex: Krugman, 1997; also Wade, 1998a) have pointed out

the hypocrisy of those who have. More radical economic geographers, such as those included in Clark and Kim's (1995) compilation, already had doubts about the future of East Asian growth. Their rationale, like that of this study, was that rapid transformation to knowledge-based production would prematurely lower or freeze the wages of the less-skilled industrial workers. Krugman (1994) also suggested, in a rather unpopular article, that the East Asian economies reflected many of the same traits of the former Soviet and East Bloc countries. He hypothesised a similar decline, on the basis that economic growth eventually slows in all industrialising countries, when its basis shifts from rapid growth, which accompanies structural transformation, to gradual growth based on technological change. In other words there is a shift from increases in factor quantity to increases in factor quality.

Attractive as these two interpretations are to this study's overall hypothesis, it must be acknowledged that they are not the interpretation of most literature, which has focused primarily on financial sector mis-management, and secondarily on international financial stability, the political and social ignorance (and avarice) of individual traders, and the unknown social effects of rapid changes to the international financial system (Corsetti et al, 1998a,b; Kregel, 1998; Wade, 1998a,b; Wade and Veneroso, 1998; World Bank, 1998b). The second interpretation has gained ground, however, as the crisis spread from the industrialising Asian countries of Thailand, Indonesia, and Malaysia to more established Asian countries like South Korea and Hong Kong, and now more geographically distant and unrelated countries like Brazil, (*New York Times*, 29 January 1999).

VI. Overall Research Approach and Outline of Dissertation

As noted above, direct measures of relative pay by sectoral employment are not available for a broad sample of countries over extended time-periods. Consequently, ratios of sectoral labour force share to GDP share (LF:GDP) and GDP per capita are used as proxy measures. Two separate studies are undertaken to estimate changes in labour force patterns and pay levels. First, Pandit and Casetti's (1989) application of the expansion method paradigm to 95 countries is expanded and modified. Ten further years of data, and improved income and labour force estimates are employed, and a comparative study is made between country data weighted by population and unweighted date. A final modification tests for the degree by which structural transformation patterns change decade-by-decade. Here, the purpose is to try and capture any acceleration in shifting patterns with the introduction of OIC and LIC restructuring practices which were implemented starting in the 1980s.

The next chapter provides an overview of three recent themes in the development literature, and their relationship to the long-standing theoretical and practical link between industrialisation and development. Amongst them, trade liberalisation and OIC restructuring strategies are seen to maintain the assumption that industrialisation is the engine of growth, without systematically integrating the implications of those changes to the industrial process. The third, which includes alternative development, anti-development, and post-development schools, is seen to have a more humanising outlook. It identifies the social and cultural limitations of economic theory and the assumptions about industry's potential as an agent of social change. This stream of research and writing is usually more critical in tone than geared to application and policy. Some

schools do emphasise the institutional and social reforms which the redefining of industrial relations would necessarily employ. Industrial restructuring schools also identify the need for social restructuring with economic restructuring, but limit most of their work to OICs. The final section on restructuring looks at recent studies of structural transformation and finds that few studies are looking at systemic change to structural transformation itself.

Chapters 3 and 4 provide the methodological background and results for the extension and modification of Pandit and Casetti's (1989) cross-sectional study of shifting structural transformation. Evidence of continued or accelerated change after the extensive policy changes of the 1980s is sought. Chapters 5 and 6 take a more detailed look at the shift, adding a better estimation of changing pay levels by sector, an estimate of the rate of the shift, and a measure of the overall relationship between GDP and industrialisation over time.

Finally, chapter 7 provides a summary of the whole study, and discusses the implications of results for further study, and for the relative position institutions and social-relations should have within development studies as a whole.

CHAPTER 2

AN OVERVIEW OF CHANGING INTERPRETATIONS OF INDUSTRIALISATION AS DEVELOPMENT

I. Introduction

Relevant literature on the future role of industrialisation in development can be categorised into three broad streams. First, there has been a standing debate, since the late 1970s, over the appropriate role of trade and economic openness in development. It exists as a sub-topic within the general debate between the neo-classical school, which favours deregulation and exploitation of comparative advantage, and a more eclectic mix of structuralists, dependency school sympathisers, institutionalists, and newer schools of new growth theory, evolutionary economics, and information economics. Second is an even more eclectic mix of 'alternative' approaches, which question the economic and social theory at the root of early development theory, and critique its impact on the LICs. Lastly, industrial restructuring theory has elements of both the previous streams, but with a focus on OICs. There are theoretical and ideological links between industrial restructuring schools and newer economic theory which challenging neo-liberalism, and between the 'alternative' stream, which has a greater concern with social relations.

Amongst the three streams of literature, there is a shortage of material in two areas. While problems of industrial restructuring are addressed in the OICs, the international and social implications of its character as *systemic* change less well explored. There is literature on the international division of labour, but there is not an extensive body of literature addressing the effect of continuously changing OIC industrialisation and consumption on industrialising countries. What literature does exist considers theoretical implications of change, without yet measuring its magnitude or pattern, or it

looks at case studies of new industrialisation. Therefore this study specifically examines industrial restructuring as systemic, and looks for evidence at the supernational level. It then considers the potential for current development thinking to provide policy solutions to emerging problems.

Two general assumptions underlie the thesis hypothesis. First, it is assumed that industrialisation is still widely perceived as the means, or 'engine of growth', for overall social and economic development. Second, it is assumed that export-led industrialisation, based on comparative advantage and open economies, is the method adopted by or imposed upon most economies. The review first summarises early growth theory and post-war development theory, tracing the rationale for adopting industrialisation as a means for economic transformation. It then traces the debate over the efficacy of export-led industrialisation versus import-substitution industrialisation. Despite widespread consensus on the failure of prolonged import-substitution, many recent studies also show that market-based interpretations of successful industrialisation both exaggerate the role of exports, and underestimate the role of the state and other social institutions. Recent alternative, counter-point (Hettne, 1990), anti-development (Watts, 1993), and post-development (Nederveen-Pieterse, 1998; Corbridge, 1998) literature is also reviewed. Since many schools within this stream reject both original development thought and its neoclassical critique, its potential value is in its focus on the social limits of changeable economic systems, and on identifying new needed empirical studies.

The debate over the state's role in development through trade then connects the 'industrialisation as development' assumption to 'industrial restructuring' concerns in the OICs. The restructuring schools are of central importance to the thesis, because they do identify and theorise continuous industrial change. However, they have paid less attention to the implications of restructuring for LICs until recently (World Bank, 1998c).

Within the three structuring schools the techno-economic paradigm, flexible specialisation, and regulation), the regulation school provides a rationale for considering the general social and economic implications of industrial change. By contrast, the techno-economic paradigm and flexible specialisation schools are often more focused on the practical social requirements of new industrialisation in local context.

Finally, a few recent studies on changing industrial patterns at the local, regional and international level are presented. A cohesive body of literature on the effect of industrial restructuring on the LICs is slowly developing. Most recently, the World Bank (1998a) made knowledge and development the theme of its annual *World Development Report*. It is continuing to maintain an e-mail discussion group on knowledge, information technology, and development, and co-operated with the International Labour Organisation in an electronic working group (May 18-July 3,1998) on information communications technology (ICT) and its impact on development (World Bank, 1999).

For the most part, studies on technical change and economic convergence show widening gaps between LICs and OICs with only a small number narrowing the technology gap (IMF, 1997). Some empirical studies show that industrial restructuring is already occurring in this latter group, which affects the social impact of industry. Verifying the increasingly rapid transformation to 'post-industrial status' is the empirical body of the thesis. Since industry maintains its historical position as the perceived 'engine of growth' in much development literature, it is useful to trace the origin of the assumptions which placed it there.

II. Industrialisation in Development Theory

A. Industrialisation and Structural Transformation

Industrialisation is best understood as the central process of *structural transfor-*

mation (Syrquin, 1988), the key observable process of what Kuznets (1966) called *modern economic growth.* Other features of modern economic growth include: narrowing productivity gaps between agriculture and manufacturing, constant changes in production method, new products, and urbanisation (Kuznets, 1966; Bagchi, 1989). Perhaps the most important contribution of Kuznets' studies of structural transformation was to replace steady-state growth theory with broader concepts of economic *transformation*. These include changing demand, trade, production, and employment (Chenery, 1988). Measuring these changes became the basis of much development research and planning in the 1960s and 1970s (ex: Chenery and Syrquin, 1975).

Structural transformation has been commonly identified with development. Challenges to this assumption are increasing, as cultural differences are articulated, environmental concerns rise, and more complex views of social structure and interaction are integrated with economics. Complexity has long been acknowledged in the development literature, but there has been a more systematic incorporation of social complexity with the UNDP's *Human Development Report*, among other work. The goal of the Reports is to broaden the basis of development measurement to match broadening conceptions of development.

Since this thesis focuses on the changes to structural transformation inherent in changes in industrial processes, the terms *modern economic growth* or *industrialisation* rather than *development* are used to describe change, unless discussing specific schools which use other terms. Gillis et al (1992) avoid defining *modern economic growth* altogether in their introductory text, on the basis that it is still defining itself. Instead, they identify *the application of scientific knowledge to economic production* as its key

feature and practice. From this practice emerged the processes of structural transformation, namely, industrialisation, migration, urbanisation, and increases in capital accumulation. Capital accumulation is particularly important, as it precedes the creation of new production equipment and infrastructure (Syrquin, 1988). Since industrialisation and manufacturing (the specific application of knowledge to producing secondary goods), has driven much migration and urbanisation, and placed much capital accumulation in the hands of owners, it has been seen as the 'engine of growth' in structural transformation. An important exception is a variety of authors who emphasise the role of agricultural development and rising rural wages (Bauer and Yamey, 1954; Lefeber, 1974; Singer, 1979 [in Adelman, 1984]; Hirschmann, 1981 [in Adelman, 1984]; Adelman, 1984; Timmer, 1988; Vollrath, 1994, Vogel, 1994, Hilhorst, 1998). With the exception of Lefeber, though, they all see agricultural and rural development as a precursor to industrialisation and structural transformation, not an alternative. Most development theory has been concerned with either initiating industrialisation, or laying the groundwork for future industrialisation.

Kuznets (1966) considered modern economic growth a universal process, guided by *common transnational patterns*:

1. The industrial system itself: production based on technology applied through modern science. Requirements include: minimum literacy, non-familial, impersonal organisation, and a high degree of urbanisation.
2. A community of human wants and aspirations, illustrated by weak resistance to technological change, the generality of Engel's law[1], widespread desire for higher standards of economic performance and levels of living.
3. Organisation of the world into nation-states.

After Kuznets (1966) in Syrquin (1988: 216)

---

1 Engel's 'law' is the observation that the proportion of income spent on food declines as income rises.

To these, Chenery added *universal factors*:

1. Similarities in production relations, such as common production functions, substitution of capital for labour with rising income, etc.,

2. similarities in domestic demand, both in private consumption and public expenditures,

3. similarities in opportunities for trade and capital movements.

Chenery and Taylor (1968: 392)

Structural transformation was therefore seen as a radical social and cultural change built around industrial processes, and universal patterns of demand.

B. Industrialisation in Early Growth and Development Theory

When post-war economists sought theoretical grounding for economic reconstruction and development policies, they found more material in classical growth theory than neo-classical concepts of comparative statics and equilibrium (Hunt, 1989). Classical economists had been concerned with explaining growth and change, and favoured industrialisation for two reasons. First, it added greater value to final products through efficient production, thus generating greater profits, and enabling expansion by owners. Manufacturing also allowed the division of labour, the exploitation of economies of scale, and the social and economic benefits of agglomeration, such as increased interaction and access to growing services (Young, 1928; Storper, 1991). Second, as family incomes rose, relatively less was spent on primary goods (Engel's law), leaving the manufacturing sector with the greatest growth potential.

Theoretical work did not distinguish economic development from economic growth until Schumpeter's work (1934, original 1911). For Schumpeter, *economic growth* was incremental, occurring through market expansion, increased capital accumu-

lation, and increased investment. *Development*, by contrast, was a social process transforming rather than merely increasing production. Transformation could occur either through the introduction of new goods, opening of new markets, introduction of new supply sources, or the reorganisation of industry. Any such changes were labelled *productive revolutions*, which Schumpeter saw as clustering in time.

Classical growth and early development theory together provide five major concepts still central to most schools:

1. The importance of markets for stimulating expansion and raising productivity.
2. The importance of profits for financing new investment, in contrast to the unproductive use of land rents, and the low saving ability of wage earners.
3. The potential for rentier[2] land-owners to halt growth.
4. The need to liberalise trade to expand markets, and to exploit comparative advantage.
5. The importance of technological and organisational change in raising productivity and meeting food and resources needs.

(Hunt, 1989: 34)

Contemporary schools differ, however, in their relative emphasis. Development theory, whether structuralist or western mainstream theory, focuses on capital accumulation and the creation of a capitalist or entrepreneurial class. Neo-liberals reject the state intervention implicit in these schools. Instead, they emphasise the development and expansion of market-systems, trade according to comparative advantage, and the potential damage of market restrictions and distortions. Distortions and restrictions in ownership were also emphasised by the dependency school, where the rentier classes, existing domestic capitalist classes, and foreign capitalist classes were all seen as obstacles to

---

2 Rentiers are those who own capital, derive income from it, but do not otherwise use it, or control its use. They are distinguished from capitalists who both own capital and invest in its return.

modern economic growth. Industrial restructuring schools have recently returned to a greater emphasis on technical change and industrial organisation. Amongst neo-liberals, structuralists and industrial restructuring schools, the latter challenge the classically defined factors of production: labour, capital, and land (physical resources). They note that the growing complexity of technical knowledge and social organisation is breaking down some distinctions between labour and capital. None of the three above approaches challenges the fundamental organisation of society around industry and production processes.

C. The Trade-Orientation Debate: Conflict over the Means of Industrialisation

Both early western development theory (ex: Rosenstein-Rodan 1943; Lewis, 1956; Rostow, 1960; Hirschmann, 1958) and the structuralist approaches, originating in Latin America, (Prebisch 1949; Singer, 1950) promoted industrialisation. Both were responses to the limitations of the prevailing emphasis within neo-classical economics on economic equilibrium, and the appropriate pricing of goods and factors to balance supply and demand. Since industrialisation and structural transformation are inherently disequilibrating, intervention seemed necessary; early development theory was inherently interventionist. Further justification for intervention came through national-level application of Keynes' theory on managing aggregate demand, saving, investment and consumption, and through funding western Europe's economic restructuring through the Marshall Plan.

In general, both early western development theory and structuralist critiques emphasised fostering structural transformation through external investments. Industrial-isation was promoted through import-substitution; that is to say, the replacement of

manufactured imports by local production. Differences between the schools lie in their relative emphasis on existing conditions and inhibiting factors and relative degrees of economic openness. Western development theory emphasised the inducement of sudden change, a 'big spurt' (Rosenstein-Rodan, 1943) or 'big push' (Gershenkron, 1962), to be achieved through providing capital to local producers or entrepreneurs. Potential social problems from cumulative rural out-migration and the resulting economic and social losses were not unnoticed (Myrdal, 1957; Hirschmann, 1958), but a positive view generally prevailed (Hunt, 1989).

The Latin American based structuralist school, arose from the post war experience of the commodity-trading countries of South America, and emphasised the problems of industrialising within an existing international economy. Structural differences in international and local conditions which could thwart industrialisation included:

1. Deteriorating terms of trade as the price and demand for primary goods rose more slowly with income rises,
2. nationally based distribution of higher profits (from new techniques) through higher wages, rather than passing them on in lower-cost exports,
3. lower import needs of the United States, which emerged as the leading post-war economic power, and
4. impediments to local development such as foreign competition, poorly developed local markets, colonial destruction of indigenous systems, and lower technical abilities and inputs.

Hunt (1989)

Though structuralist and mainstream western theories have been criticised by neo-liberals, these same limits to development are also often identified by the three industrial restructuring schools. The latter cross the ideological boundaries from more liberal to more socialist. In particular, the regulation school looks at wage distribution as a structural constraint on development (ex: Storper, 1991), while the flexible production

school and the techno-economic paradigm pay particular attention to social structures, including markets, which support the flexible worker and entrepreneur (ex: Scott, 1992; Foray, 1993).

Early criticism of import-substitution began in the late 1960s, and peaked in the mid-1980s (Helleiner, 1992 cites Little et al, 1970; Krueger, 1978; Bhagwati, 1978, as influential papers). Microeconomics, or the response of individual actors to prices, was considered more efficient than macroeconomic management. Therefore, state neutrality, fiscal discipline, private ownership, minimal regulation, and open markets were recommended, which allow competition the exploitation of comparative advantage. This list of general development criteria are sometimes labelled the 'Washington consensus' after their iteration by a US economist at a 1989 conference in Washington (Williamson, 1997). Promoting export-led[3] industrialisation, based on comparative advantage in labour cost, was particularly aided by the apparent success of Hong Kong, Singapore, Korea, and Taiwan (the 'four tigers'). Widespread support for export-orientation, and economic openness in general, is currently tempered by the recent turmoil in the global economy. But cautious supporters in the 1980s and earlier 1990s also had caveats, based on the region's exceptional political status. Historically and politically, the four tigers had been strategic areas with respect to thwarting the growing influence of China (Cline, 1982; Evans and Alizadeh, 1984). Other sceptics stressed the greater importance of productivity rises over export growth (Kavoussi, 1984; Pack, 1988; 1992a; Bruton, 1988; Syrquin, 1994; Kawai, 1994), and the important role of previous, successful import-substitution,

---

[3] Note that *export-led development* or *export orientation* is commonly equated with trade neutrality, not active promotion of exports through subsidisation, etc.

which promoted structural transformation (Chenery et al, 1986; Kubo at al, 1986; Syrquin and Chenery, 1989; Grabowski, 1994; Helleiner [ed], 1994). On the other hand, proponents of export-led industrialisation have argued that trade and economic openness foster growth in technology, production, and capacity-use. Exposure to competition expands markets, encourages specialisation, allows access to foreign technology and finance, and allows better use of the workforce through the employment of inexpensive labour (Bhagwati, 1978; Krueger, 1978; Ram, 1987; Maddison, 1989; Levine and Renelt, 1992).

Empirical analyses which test the effectiveness of exports on development use the production growth function[4] by adding an export growth variable to labour and capital growth. Numerous studies have concluded that there is a positive cross-country relationship between exports and growth (ex: Krueger, 1978; 1980; Tyler, 1981; Kavoussi, 1984; Feder, 1983, 1985; Ram, 1985, 1987; Salvatore and Hatcher, 1991; Xu, 1996; IMF, 1997). However, high variation between individual time-series and high variations among cases in cross-country studies cause many of the same authors to urge caution in interpreting strong causal relationships between exports and growth (Poon, 1994). Others have noted that exports and openness may actually have a low correlation or negative correlation with growth for low income countries (Syson and Walsh, 1968; Tyler, 1981; Kavoussi, 1984; Poon, 1994). A recent general review of literature comparing trade and growth concluded that most studies found that openness was associated with both positive and negative growth impacts (Greenaway and Morgan, 1997)

Even if export-led industrialisation is assumed to be more strongly associated with structural transformation than import-substitution, large variations in its effectiveness

---

4 Income growth is a function of labour and capital: $Y = f(L, K)$

require a more sophisticated explanation. A growing body of empirical research examines the causal relationship between exports and growth through both mathematical models and empirical research (Jung and Marshall, 1985, 1987; Sheehey, 1990; Dodero, 1991, 1993; Bahmani-Oskooee et al, 1991; Helleiner (ed) 1992; 1994;1995; Dutt and Ghosh, 1996; Greenaway and Morgan, 1997; Wood and Berge, 1997). It indicates that exports and market openness are not adequate explanations for either current variations or historical change. Often, earlier industrialisation, social organisation and industrial policy precedes successful export growth.

Yaghmaian (1994), compared the effects of export growth versus structural transformation on overall economic growth. He modified the production function with several new variables. Using four equations of increasing complexity, he found that measures of structural transformation levels explained more variation than measures of export growth. This was particularly true when manufacturing employment data were substituted for industrial labour force estimates. Yaghmaian also tested the export-transformation relationship by regressing estimates for structural transformation against export growth. He concluded that a large, significant co-efficient supported his hypothesis that structural transformation preceded growth.

Causal relations in regression equations are ambiguous, though. For example, Clark (1995) correlates industrial diffusion to trade openness[5] and concludes export openness contributes to overall industrial diffusion. On the other hand, Dutt and Ghosh (1996), re-evaluate a large body of recent work on causal relations, in a highly technical time-series analysis of GDP and export growth. Their results indicate that exports can

---

[5] Clark uses the World Bank's (1987) categories for 'openness'.

lead to growth in some cases, in others growth led to exports, and in others the two seem interrelated. They conclude, overall, that export and growth causal relationships are country specific and that generalisations are inappropriate (p. 178).

Generalisations are also rejected by a World Institute for Development Economics Research (WIDER) project at the United Nations University in Helsinki. The project was initiated to review trade policy from an empirical perspective, rather than from within liberal, or ne-classical theory (Helleiner, 1992, 1994, 1995). Originating as a review of the implications of *new trade theory* and *strategic trade theory* for LICs, it evolved into case studies of fourteen[6] diverse economies. Trade policy and macro-economic policy effects were analysed separately, since the macroeconomic turbulence of the 1970s and 1980s generated policy changes to meet other objectives than trade and growth. As Helleiner (1992) points out, neo-classical reinterpretations of trade policy began in a period of greater economic stability than did the actual implementation of policy changes.

The WIDER studies conclude that macro-economic policy played a greater role than trade policy in promoting exports, and consequently in development. Its most important role was the lowering the real exchange rate, which lowered real wages and domestic demand. Exports rose because their prices became internationally competitive, and new markets were acquired. The stabilising effect of new policies also allowed export-based industry development. Export promotion played a positive role, but openness to imports usually followed rather than preceded export growth. In other words, export promotion, not necessarily trade openness, was related to the cause of growth.

---

[6] Bangladesh, Brazil, Chile, Colombia, India, Kenya, Korea (south), Malaysia, Mexico, Peru, Sri Lanka, Tanzania, Thailand, Turkey,

The WIDER study presumed that productivity growth must eventually exceed export growth to maintain long run growth, but relationships between trade and productivity growth were difficult to establish. The only clear relationship was with economic growth itself (Helleiner, 1994). Pack (1992a) and Rodrik (1992) reviewed empirical evidence and theoretical bases for assuming that trade promotes productivity, and found limited evidence to support it. Pack's (1992a) review concludes that there is room for much more research on variations in technology transfer in SICs, and especially LICs. Extensive research in technology transfer at the micro-level and firm level has not lead to normative concepts. Rodrik (1992) stresses the different emphasis placed on allocative (comparative) advantages and technical advantages by the classical economists. Unlike allocative advantages, which are favoured by neoclassical economists, technical advantages are linked to economies of scale and the division of labour. Since economies of scale are often internal to firms, they are outside of conditions of perfect competition. Thus, the potential role of trade affects an entire system, not individual actors, making outcomes much more variable.

Related to the work on causal relationships between trade and growth, is a large body of literature relating foreign direct investment and growth. In general, growth is related to foreign direct investment only if country conditions are such that investment can be utilised (Borenstein et al, 1997; de Mello, 1997; Dutt, 1997). Todaro (1997) cites evidence that its effect can actually be negative in the absence of these factors. In other words, much research shows that foreign direct investment assists the growth of countries which have seen some structural transformation, but the question of how to begin structural transformation remains (Ravillion, 1997).

The complex relationship between exports, economic growth, and structural transformation was also the basis for criticisms of the neoclassical interpretation of south and east Asian industrialisation. Detailed country studies by structuralist-institutionalist economists concluded that state-led export promotion rather than trade openness were instrumental (Evans and Alizadeh, 1984; Amsden, 1989, 1994a, 1994b; Wade, 1990; Castells et al 1990; Henderson, 1993; Brohman, 1996a; Adelman and Morris, 1997). Furthermore, this pattern of intervention actually replicated the methods of most OIC industrialisation. With the initial exception of the UK, all OICs used tariffs, many specifically practised infant industry protection, and all had industrial policy to transform agrarian economies (Bairoch, 1993; Grabowski, 1994; Adelman and Morris, 1997). A greater consensus was later reached when the World Bank (1993) concluded that selective intervention policies, as well as 'market friendly' macroeconomic policies, could foster growth. Such qualified support by the Bank was not without its critics, who saw this as insufficient acknowledgement of the extensive role government had played (Amsden, 1994a, 1995; Perkins, 1994; Kwon, 1994; Lall, 1994; Yanagihara, 1994; Wade, 1995; Brohman, 1996).

D. Industrialisation and Current Financial and Economic Turmoil

Regardless of differing interpretations of their rapid emergence, the south and east Asian economies have recently suffered drastic downturns precipitated by the July 1997 devaluation the Thai baht. Interpretations of the recent crisis usually focus either on fiscal mismanagement or the lack of international regulation. In the first interpretation, inadequate supervision of the banking sector, and the Asian-style collaboration of business, financial institutions, and regulators, are seen as the principle cause. This

interpretation justifies the stringent loan conditions placed on borrowing countries by the IMF and supported by World Bank. In some ways, this interpretation echoes those explaining import-substitution's demise as an approach to industrialisation. For example, Adelman and Morris (1997) see state-led development as a necessary, but temporary, stage in structural transformation, which is eventually replaced by greater openness. East Asia is thus seen as having exercised an effective policy for too long. But this interpretation is weakened by the fact that the crisis originated in LICs such as Thailand and Indonesia, then spread to NICs such as Korea. Its spread to Korea, Hong Kong, and Latin America has increased the popularity of the second interpretation, which questions the stability of an unregulated international financial system (*New York Times*, 29 January 1999).

Until recently, many analysts found a role for both interpretations, but had a tendency to lean toward fiscal mismanagement (ex: Corsetti et al, 1998a). On the other hand, there are many who place primary blame on the rapid liberalisation of the Asian financial sector in the face of western pressure (Kregel, 1998) and perhaps even western bribes (Wade and Veneroso, 1998). There is considerable disagreement over the cause, and also over effective policies to ameliorate the situation (Kregel, 1998; Krugman, 1998). Despite collaboration with its sister institution, the World Bank has been critical of the austerity requirements of IMF loans, through its chief economist Joseph Stiglitz (*Globe and Mail*, 8 January 1998). The fear is that excessive interest rates, imposed to restore investors' confidence in the currencies, leads to bankruptcies for otherwise healthy businesses, and recession. A more discouraging line of criticism notes that the policies of the IMF, aided by the US Treasury, could lead to a serious backlash in affected countries

(McNeil and Bøckman, 1998; Wade and Veneroso, 1998; Wade, 1998b; New York Times, 29 January 1999). As western companies move in to purchase properties and firms, the political source of the exorbitant interest rates policies could become a focus of attack.

> The [US] Treasury and the IMF have driven a large part of the developing world into recession... And the Brazil case makes absolutely clear that the first step is not to defend overvalued currencies [through interest rates]. The punishing cost of this is overwhelmingly high. This is a lesson that the IMF and the Treasury have continued to ignore, I don't understand why.
>
> Jeffrey Sachs, cited in the *New York Times*, 29 January 1999

A growing number of usually more liberal economists have begun suggesting that short term capital movements need to be controlled (*New York Times*, 29 January 1999). Wade and Veneroso (1998) cite Jadgish Bhagwati's assertion that '...it is a lot of ideological humbug to say that without free portfolio capital mobility, somehow the world cannot function and growth rates will collapse.' Bhagwati further notes that, historically, many countries have grown well, without capital convertibility. A series of proposals are now emerging which suggest means to place a greater burden of responsibility on banks and lenders (NYT, 1998). This latter effort belatedly addresses similar criticisms of the IMF's policies for the Latin American debt crisis, in which countries, but not banks, were held culpable for bad loans (Wade and Veneroso, 1998, Wade, 1998b), and publically funded institutions like the IMF and World Bank ended up absorbing many private sector losses (Toye, 1993). Perhaps one of the more interesting and colourful critics of the current system, is George Soros (1998), who suggests that the current financial crisis and social dislocation are destabilising society, and that there has been a long term and destructive displacement of civic values by monetary values (cited in Dornbusch, 1998). Soros' work is certainly not without critics, but his thoughts on the Asia crisis are seen by

Dornbusch (1998), to be the most interesting in his overall work.

The purpose of summarising the current debate over causes and policy is to demonstrate the growing perception that institutions and values play an integral, rather than peripheral role in economic growth. However, any link between the 'Asian crisis' and industrialisation *per se* receives less attention. There is a variety of sources which do consider other contributing factors, besides financial mismanagement and international regulation. These include rising trade competition, reduced US demand, environmental mismanagement, and improperly regulated resource development, internal wage inequality, and political instability. The latter three are more prevalent in the south Asian countries of Thailand, Malaysia, and Indonesia (World Bank, 1998b). Writing before the crisis, Hart-Landsberg and Burkett (1998) examined the Asian development model from a radical, or Marxist, perspective. They were highly critical of the 'flying geese' formation in which intraregional Asian trade is unequally organised, with respect to knowledge and capital content, and which has Japan at the top. This pattern, they maintain, prevents the spread of wealth to the general population in 'lower tier' countries, and makes the system unjust and unsustainable. Kregel (1998), notes the role the 'flying geese formation' played in the contagion of the crisis, but does not criticise the system itself, which he generally sees as having aided industrialisation.

Several authors have considered the possible role international competition has played in lowering growth rates in south and east Asia, especially from China (ex: World Bank, 1998b), though Fernald et al (1997) questioned this. Paus and Robinson (1997), on the other hand, do find evidence that rising international competition did weaken the effectiveness of export-led growth in the 1980s.

The World Bank, (1998b) takes a comprehensive look at the crisis and identifies both financial and social-institutional causes. These include: an asset price bubble which emerged in Asia several years prior to Thailand's devaluation; investment pressure from the OICs which were seeking to invest in growth markets, in the face of lower OIC growth; and the destabilising effects of the push to shift from labour-intensive to higher technology production. The latter factor led to higher regional interdependency, and a narrow basis for production. Internal changes, which contributed to overall destabilisation after the devaluation, are identified as: the inadequate replacement of traditional social relations in emerging urban-industrial society; and unsustainable resource use.

Refereed articles on the crisis are still rare, and their interpretations must all be seen as preliminary, in the face of continuing developments. The role of industrialisation and development in the crisis is difficult to gauge. Suffice to say that rapid changes in trade relations and technical sophistication, driven by aggressive international competition, have been proposed as one cause, and require further exploration. Rapid social changes and poor social development have contributed to the resulting social crisis (World Bank, 1998b).

E. Growing Recognition of Institutions in Economic and Development Theory

Four other articles are briefly summarised here to provide further evidence of the increasing integration of institutions and social concerns into economic and development theory. Institutions have always received emphasis in development theory, even if only to promote modern economic growth and industrialisation at the expense of traditional culture. Their role in economic theory, on the other hand, was all but eliminated by the birth of neoclassical economics in the mid-nineteenth century.

Lall and Latch (1998) identify three points of view relating liberalisation and industrial performance. The first is variously known as neoliberalism, new political economy, libertarian, or Austrian economics and has the least tolerance for restrictions. Market failure is seen as a lesser problem than failure of the 'corrected' or regulated market. Mainstream neo-classical economics, on the other hand, is represented by the Washington Consensus, and has a constrained role for government in market failure. This is the view which dominated development literature in the 1980s. Lastly, Lall and Latch identify emerging schools of evolutionary economics and structuralist-institutionalist views, which see imperfect access to information and imperfect competition as the rule, rather than the exception in the capitalist economy. They are even considered essential. In these schools, the market is interpreted as a more complex phenomenon, and the role of government is increased and is more sophisticated. In sum, the concept of 'market-failure' has been broadened in mainstream economic literature, lessening the role for pure theory in policy, and increasing the importance of micro-level processes and behavioural mechanisms (Lall and Latch, 1998: 462).

Streeten (1997) examines concerns arising from globalisation[7] and competition, and identifies 11 concerns for development theory and practice. Significantly, the first four refer to appropriate institutional development at the global level. The eleventh considers the interaction of policy and institutions and five levels: micro-micro (firm, farm, household); micro-level; meso-level (groups and regions); macro-level; and macro-macro level (global).

---

7 Generally, the term globalisation is used in this study to refer to international economic integration, but it also has social and cultural aspects, as identified in the 17 varied definitions provided in Streeten (1997, appendix).

Amsden (1997) focuses less explicitly on institutions, but contrasts the current neo-liberal focus on exchange with Adam Smith's original emphasis on production. If production is the central focus of theory, more socially complex concerns such as the micro-economic problems of firm formation, the acquisition of technology, and industrial development are more important. They are not addressed by trade and exchange liberalisation, as the previously cited research on foreign direct investment and export-growth research indicated. Amsden identifies five points regarding how current economic theory, by preferring exchange over production concerns, fails to meet the institutional needs of late industrialisation (p. 470). Section IV considers the institutional needs of production in more detail.

Finally, Adelman and Morris (1997) provide an historical review of development theory and practice, based on their own earlier works. They identify four major lessons. First, development has been highly non-linear and multifaceted. Four distinct development paths can be identified for OICs and three for NICs (p. 833). Second, institutions matter most in explaining the existence of development, help determine its efficacy, and have a non-linear effect (p. 384). Third, countries make their own substitutions for needed market institutions and local demand by using government institutions, military demand, and other external demand. Lastly, while similar policies are critically important between interacting countries, different policies are required at different stages of development. To this end, they recognise a three stage approach to development, which culminates in a more liberal policy environment. The latter only emerges when countries approach OECD status, and establish balanced growth, participatory governance, power-sharing, and representation by the middle-classes and labour interests (p. 838).

All four review papers have not only a strong or central emphasis on institutions and social development, but also maintain a strong bias toward industrialisation as development. This renewed emphasis on social and institutional development does represent a clear move away from neo-classical conceptions of development which dominated in the mid-1980s. It does not, generally, encompass a consideration of changing industrial processes, or always challenge the central role of industry in development. It does not resolve whether or not a preconceived notion of industry determines the nature of appropriate institutions and social relations, or whether institutions and social relations determine appropriate 'industry', or 'the application of science to production'. At what stage should there be incorporation of new environmental concerns about changing conceptions of natural processes, and cultural concerns about changing social relations and individual well-being? Deeper challenges to the assumptions of development thinking are made in alternative development, anti-development, and post-development schools.

III. Challenging the Bases of Modern Economic Growth and Industrialisation

Highly negative criticisms of modern economic growth and mainstream development theory provide some ideas which are oddly complementary to those of the industrial restructuring schools. Like export-led growth theories, the anti-development schools were largely a counter-point to early western and structuralist development theory. Post-modernism, post-colonialism, post-Marxism , and their analytical terminology dominate radical critiques of development, and are well summarised by Corbridge (1993) and Escobar (1992, 1995). Post-modernism in particular challenges the basic elements and

processes defining the modern economy and the world view which produced them (that is, its ontology and epistemology). Economic and development theory are re-analysed as culture-specific ideas. Much practical and empirical work also exists, from a range of scholars and practitioners, and emphasises on local manifestations of development, local struggles for control over everyday life, and social and cultural aspects of development and the economy. New roles are seen for academics and intellectuals in participation-action research (Edwards, 1989, 1992; Lehmann, 1990; Fals Borda, 1990).

Ferguson (1990) and Sachs (1992, editor) were the first to evaluate development as a *discourse*[8] constructed by external observers (Escobar, 1995). For most development critics, this external construction of 'development' lies at the root of development failures (Edwards, 1989; Sachs, 1992; Escobar, 1992). People are controlled and defined by the practitioner's perceptions of local needs and of appropriate new processes despite the fact that they are the object of development practice. Thus western interpretations of their culture were made in the context of necessary change (Said, 1979; Bahba, 1985). Complex societies are this way reduced to functions and archetypes such as 'small farmers', 'landless peasants', 'lactating mothers', 'noble savages', and 'villagers', in what Escobar (1995: 30) calls 'the infantalisation of the third world' (also: Spivak, 1990; Pigg 1992). Such definitions homogenise and dismiss complex cultures and economies, but also reflect discomfort within OICs with their own rapid cultural change (Bahba, 1985; Nandy, 1989).

This objectification of peoples and the abstraction of development theory from

---

[8] Discourse in this context is the articulation of processes and elements to define truth socially (Escobar, 1992: 416, after Foucault). This contrasts with Kuznet's (1966) concept of development as a universal process, for example.

practice, made development an apolitical process, and removed it from indigenous control, since development became a list of criteria to meet, rather than a social process (Edwards, 1989; Ferguson, 1990). One loosely defined counter-point to mainstream development theory was the populist approach (ex: Lipton, 1977; Chambers, 1983; 1985; Richards, 1985; Lehmann 1990; Edwards, 1992; Friedmann, 1992; Brohmann, 1996b). Following Friere's (1970) concept of action-research, it rejected the separation of research from practice, of understanding from social change, and of object from subject. That is to say, development is not a distinct state to be achieved, but a process which defines itself through practice in distinct geographical and cultural settings. It emphasises the subjects' participation in decision-making and social action. Because development is locally defined, meeting most local needs through local human and physical resources is also stressed (Edwards, 1989; Fals Borda, 1990).

Increasingly, the practical potential of non-governmental organisations (NGOs) as local, more participatory actors has been recognised by mainstream development actors (ex: World Bank, 1991; Economist, 22 June 1996). Edwards (1989) considered the longstanding gap between NGO practice and large institutions as a major roadblock to theoretical and practical change. However, there are caveats to the uncritical acceptance of NGOs as new development actors. These include their heterogeneity of practices and goals, and their possible exploitation by anti-statist (that is, neo-liberal) actors (Hettne, 1992; Edwards and Hulme, 1992; Robinson, 1992; Holmén and Jirström, 1994).

Escobar (1995) considers populist studies the first attempt to formally articulate alternatives to mainstream development. Nederveen Pieterse (1998) suggests that many of the concerns of the populist school and 'alternative development' have now been

incorporated in mainstream theory, weakening any claim that it constitutes a new paradigm. Local-scale action, empowerment, and participation have entered general mainstream theory (ex: International Labour Organisation, 1977; World Bank, 1991; Wolfensohn, 1998), but many reject this incorporation as superficial (ex: Sachs, 1992). A production-centred basis for social organisation is still retained, consequently, so are the decision-making methods. For example, the basic human needs approach was essentially an effort to expand the market economy, even though it broke ground for more radical critics (Hettne, 1990). More recently, the move toward incorporating alternative development has become more integral to UN efforts, so much so that Nedeveen-Pieterse (1997) suggests that the real ideological divide is now between the United Nations, and its sister Bretton Woods institutions of the IMF and World Bank.

Escobar (1995: Chapter 5) critically reviews recent United Nations revisionist approaches such as Integrated Rural Development, Women in Development, and Sustainable Development (in Colombia). To him, they fail because they simply attempt to extend an inherently unstable market economy. Such revisionist approaches make little acknowledgement of the causal role that earlier development practice, and later free-market reforms, may have played in creating the underdevelopment now being addressed.

Perhaps because of this dual goal of participation and market reform, Integrated Rural Development lacked the social and cultural inputs needed for fundamental change. The belated incorporation of women often ignored the reality that much of their earlier social displacement was from market economics and new ownership patterns. Despite gains in knowledge about the fundamental role of women in social and economic

development, the overall goal of new research is to transform women into workers in a modern economy. This limits the research's potential. Pre-existing variation in sex-role differences and their effect on the transformation is ignored (Strathern, 1988). Benería and Feldman (1992), among others, note more cynically that Women in Development, as a UN fostered programme also coincided with the emergence of an international division of labour, the rise of free trade zones, and the rise of women as a source of inexpensive labour.

Lastly, Sustainable Development as defined by the World Commission on the Environment and Development (1987), is also criticised as market centred. Any social and cultural importance of nature and related knowledge is reduced to its economic value. One insidious result of qualifying Sustainable Development with market concerns, according to Escobar, is the shift in focus in blame. Concern about the environmental damage cause by high productivity for high profits has been displaced by concerns over environmental destruction caused by poverty. The implicit assumption is that the solution is modernisation, as defined by external agencies.

Working from a more Marxist perspective, O'Connor (1993) sees the ecological change caused by economic growth as the second contradiction of capitalism[9] (also see Daly and Cobb, 1994). O'Connor thus separates the *conditions of production* from *production*. The former can be destroyed by economic growth and development, when constant change and innovation destroys the social and physical base of capitalism. As noted by Polanyi (1957), economic restructuring then occurs at the expense of existing

---

9 The first contradiction being Marx's inherent conflict between production and the relations of production.

economic and social conditions, but the cost is absorbed by existing social systems or individuals, rather than the market.

Escobar's approach, though flawed, is more academic than much alternative development theory, basing itself on Foucault's work on discourse, and suggesting alternatives (Corbridge, 1998). Escobar suggests ethnography as a second, complementary approach to populist development. Development researchers should be examining existing alternatives, including hybrid adaptations of modern economic development, as recreations rather than destructions of culture (Dahl and Rabo, 1992). This, more anthropological, approach is reflected in Cooper and Packard (1997). Escobar cites work such as Kulick (1992) on Papua New Guinea, Fugelson (1992) on Kenyan Muslim women, and Comaroff and Comaroff (1991) on adapting to colonialism in Southern Africa as identifying emerging patterns. He goes further to recommend fostering a large scale, horizontal, cross communication between such local endeavours: 'Mediating this communication of formulating a conversational community across cultures is an important project of anthropology' (Gudeman, 1992: 192 [in Escobar, 1995: 100]).

For the critics of development, the failure of development theory and its revision for grassroots needs, is a failure to address the cultural roots of the market economy. Market economics, and the decision-making privileges it accords the owners of firms and owners of the 'means of production', is at odds with the complexity and diversity of social organisations required to ensure social stability and relevance.

Alternative development and, especially, post-development schools are not without sceptics and critics from within the more critical schools of thought. (Scepticism from within the neo-liberal and neo-classical schools can be assumed.) Corbridge (1998)

is one who also provides a useful review. He identifies the development practice benefits of post-development thinking as: maintaining a critical perspective on the failures of development practice, acknowledging unstated goals of past and present practice, and humanising development. On the negative side, he sees much writing as too simplistic in its identification of theories and approaches (as does Nederveen Pieterse (1998)); romantic in its perception of rural culture; prone to isolationism without considering its human and social costs within a globalising society; and having a tendency to conflate technology with science. He notes that the latter is also a failing of much mainstream development theory.

Despite Nederveen Pieterse's and Corbridge's scepticism, the value of alternative and post-development schools is in their challenge to industry-centred conceptions of development. While there is no sign that industrial production and industrial products are disappearing, industrial processes are changing radically, and concepts of appropriate environmental and social standards are changing. Mainstream and neo-classical development theory have little to say about these changes. Along these lines, Nederveen-Pieterse (1998) sees a more important approach for development thinking to be *reflexive modernity*. In other words, development is the means of managing the problems of modern economic growth and social organisation. This definition may fall short of some goals of alternative development, particularly that of placing economic growth lower on the development agenda. It does reflect the populist approach of shifting the meaning of development from a goal to a process. In this regard, it is likely better equipped to address the phenomenon of continual industrial change.

With the exception of Schumpeter's (1934) work, both economic theory and

development theory were formulated with little attention to continuous industrial change. There was little expectation that industry, itself, would change its role in social organisation. At least some of the alternative schools see development as the cultural adaptation and application of industrial potential, instead of the adaptation of culture to given industrial processes. In this sense, it reflects and expands on the social development concerns of the industrial restructuring schools.

IV. Industrialisation and Industrial Restructuring in the Older Economies

Unlike structural adjustment programmes for LICs, the three dominant restructuring schools all recommend institutional and social involvement in the economy. Restructuring schools are based on the assumption that entire economic systems do change, based on changes in the dominant system of technology. By integrating the role of technology in development, restructuring schools integrate the social bases for technological growth and change.

Restructuring schools emerged when the extended economic instability of the 1970s became seen as systemic decline rather than cyclic downturn. At the root of the decline was the breakdown of nationally-based production and distribution through 1) increasingly international production and complex organisational needs, 2) labour's dissatisfaction with mass production methods and its consequent unrest and demands for rising wages, 3) declines in demand for standardised products and rising demand for specialised products, and 4) declining profit and productivity growth when the economic and social system reached its limits for incremental growth and change (Amin, 1994a). Each restructuring school sees both major economic change and everyday economic co-

ordination as integrated social and institutional processes, rather than as the result of individual actors making choices. Success is dependent upon appropriate societal norms. Each also agrees that the existing norms, developed under mass production, have ceased to be effective. The schools differ, however, in their relative emphasis on economic versus social determinants of change. A common commitment to industrialisation and growth is shared, but different emphasis is placed on the five features of growth listed in section II.B (p. 25-26). This continuity in theory is reflected in Elam's (1994) tidy renaming of the three main schools as neo-Schumpeterian (the techno-economic paradigm), neo-Smithian (flexible specialisation) and neo-Marxist (regulation).

By definition, most research work on economic restructuring is based on OIC experience, but research on modern production methods in LICs is increasing (ex: *International Development Studies Bulletin*, 1992; Humphrey (ed), 1995; World Bank, 1998a, 1999). But studies do not often focus on the impact on the structural transformation of NICs. A review of literature roughly representative of the three above named schools shows that questions about changing structural transformation patterns are raised more often than they are addressed.

A. The Techno-Economic Paradigm: The Economy as Socially Organised Production

The *techno-economic paradigm*, gives primacy to technology, but sees social institutions as necessary to organise and guide technical change and learning. Centred around work of Freeman and Perez in the early 1980s, it draws on Schumpeter's (1934;1939) works on productive revolutions, business cycles and the role of the entrepreneur (or capital-owner, or firm manager, or any decision-maker). Schumpeter's

theories are applied to Kondratiev's observations of 50 year price cycles, and then extrapolated to arrive at the theory that economic development occurs in long waves of growth based on a dominant technology (Freeman, 1982; Perez, 1983; Dosi et al 1988). For 'neo-Schumpeterians', the 1970s marked the end of a long wave centred on electro-mechanical technology and inexpensive fossil fuel, and the beginning of one based on information technology. Change is not automatic, since it depends on a supporting social and institutional framework, but the economy, not society, is the driving force of social change (Gertler, 1988,1992; Amin 1994).

The techno-economic paradigm has already affected policy and governance. For example, an appropriate social-institutional framework was proposed by the Organisation for Economic Co-operation and Development's 'Technology and the Economy Programme' after several years of research and discussion (OECD, 1991; 1992). The recommendations of the programme were to: 1) strengthen national innovative capacities, and 2) globalise access and input to science and technology. A similar policy was proposed by the United Nations Advisory Committee on Science and Technology in 1979, but proved difficult to implement (Sagasti, 1997).

Despite the OECD's global emphasis, it directed little practical policy at technology diffusion to LICs. Yet most studies of technical change and economic convergence note that there is increasing divergence between LICs and the OICs, with only a few NICs closing technology gaps (OECD, 1992; Baumol et al, 1994, IMF, 1997). Visible stagnation contrasts with other expectations of automatic transfer though trade and market-openness (ex: Cantwell, 1995; Drucker, 1993). Such expectations have begun to receive criticism from even more conservative observers (ex: *Globe and Mail*, 27 May 1996:

review of the World Bank's 1996 *World Development Report*).

B. Flexible Specialisation: Defining Labour when Labour and Management Merge

Like the techno-economic school, flexible specialisation focuses on technology's effect on production and society. Unlike the techno-economic and regulation schools, it consciously avoids the determinism of economic eras, or long waves, and abstract theory (Amin, 1994a). Instead, it contrasts mass production, and flexible specialisation as two co-existing production systems, whose relative dominance is changing.

Piore and Sabel (1984) wrote the defining work on flexible specialisation, based on the 1970s industrialisation of Emilia-Romagna in Italy. Salient features include 1) clusters of specialised small and medium firms, 2) market and non-market links between goods, information, and people, 3) implicit or explicit behaviour codes based on a common social or cultural background, and 4) the support of the cluster through public and private institutions (Rabelotti, 1995).

Amin (1994a) summarises the ideal-type industrial district as including: co-operative task division amongst autonomous firms to maximise scale benefits, but allow flexibility; the reintegration of research and design to increase innovation and responsiveness; the reversal of de-skilling and worker isolation which occurred under the factory system; increases in worker-participation and collaboration; the decentralisation of decision-making; the deployment of multipurpose technology; changing the human relationship to technology (i.e., from operator-machine to craftsman-tool), and the development of a culture of co-operation, trust, and negotiation within and between firms (p. 21). From this description, it is clear that the flexible specialisation school is gener-

ally positive in outlook, and more worker-oriented than the techno-economic school. The manifestation of these principles in workplace practice has been questioned, though, especially by students of the regulation school, and socialist economists (Amin, 1994b; Gertler, 1988; 1992; Esser and Hirsch, 1994; Pollert, 1988, 1991). In general, the debate is over whether flexibility comes more from new techniques or from reduced labour rights (Gertler, 1988).

Nevertheless, flexible specialisation is an observable phenomenon (Gertler, 1992), although it may be more prevalent in Europe than the United States (Pollard and Storper, 1996; Nederveen Pieterse, 1997). Its appeal for LIC development is in its hypothesised ability to increase economies of scale while maintaining a more traditional focus on small firms and local and cultural development (Rasmussen et al, 1992; Humphrey and Schmitz, 1996; Streeten, 1997). Rogerson (1994) summarises literature on both its potential *in* LICs, and the possible negative impact of its adoption by OICs *on* LICs.

Piore and Sable (1984) proposed a specialised international economy, with flexible specialisation in OICs and mass-production in LICs, as do the neoclassical economists. Unlike neo-classical theorists, they also saw demand being managed internationally. Against this vision of benevolent management and stability, Rogerson (1994) contrasts those factors of flexible production which might prevent future specialisation in mass-production by LICs. Rogerson's factors are drawn from several sources, mainly Hoffman and Kaplinsky (1988), Kaplinsky (1988, 1991), Oman (1991), and Douglass (1992). First, new production relies more on proximity, which undermines the current comparative advantages of low labour costs and the resulting international dispersal of production. This is because proximity to markets aids niche-market product

development, and because simultaneous engineering and production practices benefit from personal interaction. Second, new technology reduces the overall labour contribution to production (as measured by number of workers) and requires more skilled labour. With respect to raising productivity through technical progress, Pack (1992a) notes that 'no theorem exists to demonstrate that [total factor productivity] does not run into diminishing social returns'. Finally, the rise of various non-tariff barriers lowers the attractiveness of off-shore production (Rogerson, 1994:3-4).

In contrast to Rogerson's critique, others see flexible specialisation as a new approach for both new industrialisation in the LICs, and industrial restructuring in the OICs (Storper, 1990; 1991; Schmitz, 1990; Rasmussen et al 1992; Schmitz and Musyck, 1994; Humphrey, 1995; Humphrey and Schmitz, 1996). They do have caveats, however. As Rasmussen et al (1992) point out, flexibility in LICs is far more likely to be based on labour and wage flexibility than the benefits of new flexible technology. Hilhorst (1998), for example, does not see the industrial district as an appropriate concept for LICs, outside of a few urban areas. Some case studies do demonstrate that there is potential (Sverrisson, 1992; Nadvi and Schmitz, 1994; Schmitz and Musyck, 1994; Cawthorne, 1995; Rabellotti; 1995; Schmitz, 1996; Chari, 1997). But wages remain low, large firms tend to gain dominance, and the existing culture of support and interaction may break down as success is achieved[10] (Smyth, 1992; Wilson, 1992; Cawthorne, 1995; Kattuman, 1994). The breakdown of social systems over time raises concerns about the fundamental goals of participatory development, which were brought up by Escobar (1995) and others.

---

[10] This cultural breakdown has also been noted in Emilia-Romagna, which did not do as well in the late 1980s (Gertler, 1992).

If industrialisation alone is the goal, it must be remembered that industrialisation changes, or can change, social relations.

The main problem for small firms is not their size, but their isolation (Späth, 1992). Supportive policies are often lacking and linkages do not emerge from mere clustering (Aero, 1992; Rasmussen, 1992; Hansohm, 1992; Rabellotti, 1995; Schmitz, 1994). Similar social limits were also found with the restructuring of large firms around 'just-in-time' delivery and 'total quality management'. Lack of commitment by management, lack of involvement by labour, and lower skill levels hamper the full exploitation of new methods (ex: Kaplinsky, 1995; Posthuma; 1995; Carrillo, 1995). Similar difficulties were experienced when new methods were transferred from Japan to the North America, without consideration of the differences in labour relations (Ettlinger, 1994).

C. The Regulation School: Evaluating the Predictions of Other Schools

The key features of the regulation school are summarised in the introduction, so this section focuses on its use for evaluating economic change. According to Amin (1994), the regulation school's most important and valued theoretical formulation is that of the post-war economy as a socio-economic phenomenon. Various sub-schools exist (ex: Tickell and Peck, 1992, 1995; Jessop, 1995), but their common, essential goal is the identification of socio-economic systems (or *regimes*), the identification and explanation of a system's internal contradictions, and speculation on possible new systems (Amin, 1994: 7). However, one common criticism is of the regulation school's lack of adequate conceptual sophistication to interpret economic change. In particular, it homogenises different national mass-production systems (Hirst and Zeitlin, 1991), lacks explicit conceptions of spatial inequality (despite assuming its inherent existence under capital-

ism), has no theory of change from one system to another, and has no theory of the state (Boyer, 1988; Hay, 1995; Tickell and Peck, 1992, 1995; Painter and Goodwin, 1995; Nederveen-Pieterse, 1997). Aglietta (1998) counters these claims by pointing out that the regulation school was a research agenda, not a theory, and McLeod (1997) finds that research has moved beyond a primary concern with economic crisis, to analyse forms of state and governance.

Tickell and Peck (1995) see the school's value as a tool for evaluating predictions of new socio-economic systems *after* mass production (Fordism). In brief, the regulation school's interpretation of the economy as a social phenomenon provides a rationale for analysing the institutional infrastructure through which modern economic production ('capitalist development') occurs (p. 363). Aglietta (1998) further points out that the most important social feature of the modern economy is waged labour, and thus identifies a subject through which social change can be studied. Both social and economic change are embodied in changes to waged labour, as examined through pay levels, employment levels, unemployment levels, participation rates, and sectoral distribution.

Tickell and Peck consider the neo-liberal and flexible specialisation schools (both of which they consider 'post-Fordist'), as similar attempts to explain socio-economic phenomena. They conclude that both schools are theoretically unsound, because they construct entire socio-economic systems on abstractions from production systems. Neither formulates a corresponding 'mode of social regulation'. Predictions of a *yeoman's* or *artisan's democracy* (Piore and Sabel, 1984) or a 'neo-Schumpeterian workfare state' (Jessop, 1992; 1994) are thus seen as premature, Each lacks an underlying ideology to govern production (Amin, 1994; Jessop, 1994). Both are inherently unstable and

polarising, relying excessively on supply-side instruments, and external economic forces (p.366). For example, Esser and Hirsch (1994) use roughly the same post-Fordist features as Jessop (1994) to project a bleaker social vision.

Esser and Hirsch's (1994) more negative assessment of the impact of technological change contrasts with those of the flexible specialisation school and more neo-classical interpretations, summarised below in *The Economist*'s (1994) 'Survey of the World Economy':

> In the long run, trade with developing countries should have little impact on overall employment; it will simply reallocate labour from import-competing industries to export industries. And because this will mean a shift in jobs from low-skilled to high-skilled industries and services, it ought to be beneficial, as it will lift the average quality of jobs and hence, average wages... Let China make toys while America makes aircraft and pharmaceuticals.
>
> *The Economist* (1994: 19)

Even many neo-classical economists are not that simplistic about the problematic nature of such a transition, though. The *Economist* article itself recommends extensive social support to those in the OICs affected by massive-layoffs, and enhanced training and education in general. It also notes the uncertain position of NICs, which now face competition from LICs. Regarding international labour divisions and poor labour conditions, the World Bank noted the need for worker organisation both to improve working conditions and help foster economic growth (World Bank, 1995a). These constitute additions to existing neo-classical thought, however, not integral theoretical concepts. Focus remains on liberalisation of the economy, deregulation and trade openness.

The use of the regulation school as an evaluative tool is implicit by the studies in the *Institute of Development Studies Bulletin* (1992) and in *World Development*

Humphrey (1995, editor). However, they are directed at the micro-level of industrial clusters or firms. Macro-scale studies of employment, wage, and sectoral changes are not usually undertaken within the regulation framework, but reflect implicit concern with systemic change caused by production change.

Emmerij (1994), for example, sees current macro-economic employment problems in OICs as echoing those of the 1920s. He recommends a similar reduction in overall working hours, where labour force participation rates are lowered, but wages are not. For LICs, he recommends the policies and practices of the basic needs approach advocated by the International Labour Organisation and World Bank prior to the 1980s. Prior to the liberal emphasis of the 1980s, these policies reflected greater complementarity between major social reforms and financial and economic reforms[11]. While his recommendations for LICs are largely normative, those for OICs are based on historical experience of the pre-war and post-war economy. Emmerij (1994) explicitly interprets the economy as a social phenomenon, in which institutions ensure the provision of employment and guide technical change.

D. Other Studies of Changes in Industry

Four other more empirical studies examine the changing distribution of employment, wages or both. Their results challenge both assumptions about the 'virtuous circle' of mass-production and mass consumption (ex: Jessop 1992) and predictions that increasing wage flexibility will raise overall employment and productivity in the long run.

---

[11] These include urban decentralisation, environmentally sustainable development, full labour force use, increasing farm incomes, land reform, the enhancement of traditional rural and urban informal sectors, human resource investment, examination of institutional alternative, and better social security.

Amsden and van der Hoeven (1996) examine changing manufacturing wage, employment, and output patterns in LICs to test the neo-liberal assumption that wage declines resulting from structural adjustment will result in employment and output rises. Overall, they conclude that employment and output rises have not accompanied structural adjustment, and that a contractionary environment may inhibit adjustment.

Paus and Robinson (1997) examine the effect of economic openness on wages. Their main focus is whether exports cause growth, rather than wage inequality. Tangential to their goal, however, they observe that the indirect impact of exports on growth was reduced in the 1980s with increased international competition (as cited earlier).

Weiczorek (1995), Pandit (1987), and Pandit and Casetti (1989) examine overall sectoral employment and labour force changes. Weiczorek's work was largely descriptive, identifying the absolute and relative declines in manufacturing in OICs and LICs respectively. Only in Asia was manufacturing employment increasing, especially in South Korea. Julius and Brown (1993) noted that relative manufacturing decline dates to the turn of the century, as more labour moved directly from agriculture to services.

Both Weiczorek (1995) and Pandit (1987) compare the differing demand-side and supply-side interpretations of sectoral employment change. Supply-side perspectives explain the historical rise of service employment as the result of technology raising manufacturing unemployment, thus lowering service labour costs. This lowered the need for service productivity growth, and made the service sector the major employer. Demand-side interpretations emphasise the rising service demands of both waged labourers and increasingly complex social and manufacturing structures. For this thesis, however, both explanations have value, since the focus is on the overall decline in wages

and employment in the manufacturing sector, which then affects both labour's demand and labour supply.

Pandit and Casetti (1989) questioned the universality of structural transformation over time and tested the stability of sectoral employment patterns. Taking successive five year cross-sections of sectoral employment from 1960 to 1980, they found significant changes: the industrial labour force was smaller over time, while service employment was both higher and emerged earlier. By contrast, Syrquin and Chenery (1989) examined structural transformation from 1950 to 1983 using 18 variables, and concluded that structural transformation patterns have not changed significantly. They attributed an overall drop in manufacturing output and industrial labour force share to OIC changes, rather than to a pattern which affected all countries. However, their empirical goals were different than Pandit and Casetti's. The *general* structural transformation pattern is: declining agricultural employment, rising industry, and rising services. The general pattern has not changed; the *relative* pattern has (Pandit and Casetti, 1989); Syrquin and Chenery were testing the general pattern. Yet, relative change can affect incomes and the distribution of wealth.

Case studies of NICs also indicate rapid changes toward capital-intensive manufacturing and a possible lower impact of industrial employment on the overall economy, both in duration and regionally (Selya, 1993, 1994; Park, 1994, 1995; G.L. Clark, 1994, 1995; Glasmeier, 1994; Mallick and Carayannis, 1994). With this evidence in mind, the thesis draws on Pandit and Casetti's (1989) work to test if NICs are exhibiting OIC patterns of sectoral shift at an earlier stage and if LICs and SICs replicate early OIC growth and structural transformation.

V. Summary

Industrialisation is deeply rooted in development theory as the core, or 'engine of growth', of development. This has been especially articulated in the work of Simon Kuznets and Hollis Chenery, who described the dynamic social and political process of *structural transformation*, which is centred around industrialisation. Much early debate in development thinking was about the means of industrialisation, rather than the nature of development.

Regarding the means of industrialisation, approaches have shifted their focus over the past 50 years to be increasingly inclusive of institutions and social relations.. Early development theory drew on eighteenth and nineteenth century economic growth theory, advocated a highly interventionist approach, and fostered the creation of institutions and social classes which reflected western experience. Structuralist and dependency critiques challenged the means of industrialising, and the ease of industrialising in an established world economy, but a transformation to industrial society was still broadly supported. The resulting dominant method from early thinking was import-substitution, and was unsuccessful in the long-term.

This led to debate over economic openness, the appropriate role of government in development, and the role of exports and trade. Debates over trade and economic openness are not yet resolved, but there is growing evidence that there are social and economic prerequisites for the successful implementation of more open economic policies. These prerequisites are not systematically addressed by either neo-liberal or neo-classical theory. Overall, there has been an increasing emphasis on institutions and social relations in development thinking since the mid-1980s, resulting from the limited

success of economic liberalisation, and export-led growth.

New and greater roles for institutions and social relations are further developed in industrial restructuring schools. Early development theory did not integrate concepts of changing technology or general changes in industrialisation as a process. Restructuring schools, by contrast, have industrial and technical change as a central focus. Because change is a social process, and because new industrial technology alters the relationship between capital and labour, restructuring schools give social relations and institutions a greater role in economic systems. They maintain a central role for industry in development, through the development of new technology, and through focusing on knowledge development, but apply their attention to industrial change in OICs. They do not fully address the impact of changing industry on LICs, or question the central role of industrialisation in development. Such more fundamental challenges to development thinking are made in alternative development and post-development thought.

Alternative development thinking challenges the world view behind the adoption of industrialisation, including the definition of factors of production, and the underlying political and social relations. A greater, or central, role for participation is promoted. Development is defined as a process, whose goals are defined through the process of participation. Much thinking in these schools is anthropological in approach and in origin. In the last decade, there has been convergence between these approaches and those advocated by the United Nations and World Bank, though there is some scepticism about whether any serious diversion from industrial goals would be considered.

The overview of the literature produces three observations: institutions and social relations are increasingly seen as important across otherwise diverging schools; industrial

processes and the role of industry are changing in the OICs; and the assumptions behind industry-centred social organisation are increasingly questioned for the LICs. There is already evidence that the industrial processes and patterns of early OIC experience are not replicating themselves in the LICs. What remains to be examined is 1) whether or not the process is continuing, or even accelerating, and 2) whether specific evidence of a lower social position for industrial labour can be identified. If a changing social impact for industry can be identified, the relative importance of institutions and social relations in development needs to be considered. In brief, development thinkers need to consider whether social institutions and relations should be fostered in order to facilitate new forms of industrialisation, or whether the fostering of those social relations and institutions is, in itself, development. The former is an acknowledgment of current changing conditions in the OICs, and an attempt to facilitate adaptation. The latter acknowledges that current changes will continue into the future and spread. If industrialisation guides institutional and social development, continual industrial restructuring undermines the institutions and social relations necessary for social and economic stability.

CHAPTER 3

METHODOLOGY AND DATA I: LABOUR FORCE CROSS-SECTIONAL ANALYSIS

In general terms, this thesis assumes that labour-intensity in industrial activity has decreased even in the most labour-intensive industries, thus affecting all countries (IMF, 1997). This offsets the benefits of a comparative advantage in labour cost, and promotes an earlier shift to more capital-intensive and knowledge-intensive activity to increase international competitiveness and growth. Therefore, the thesis attempts to measure the patterns of structural transformation in the labour force, on the assumption that such patterns reflect this shift. In more specific terms, the thesis examines relative and absolute changes in sectoral labour force activity and associated levels of GDP per capita. A method of cross-sectional analysis for 95 countries by Pandit and Casetti (1989) is first analysed in detail, then expanded and modified to incorporate four new considerations: 1) new labour force estimates from the International Labour Organisation (ILO), which includes estimates for 1980 to 1990, 2) new GDP per capita estimates from the Penn World Tables, which are specifically designed for the United Nation's International Comparison Project, 3) a separate test in which country labour force data are weighted by population, and 4) a specific test for any shift from 1980 to 1990, to gauge the impact of accelerating technical changes in industry, and the implementation of structural adjustment programmes. To gauge any impact on social relations, which are emphasised by the regulation school, sectoral labour force share and GDP per capita are used as proxy measures. A smaller industrial labour force share, plus a peak size at lower GDP levels

are interpreted as an overall decline in the social position of labour.

I. Historical Time-series and Cross-section Estimates of Sectoral Change

Sectoral change in labour force share in industrialising countries is estimated by measuring variations from the structural transformation patterns first hypothesised by Fisher (1939) and Clark (1940), and later measured by Simon Kuznets and Hollis Chenery and his colleagues (Kuznets, 1957, 1966, 1971; Chenery, 1960; Chenery and Taylor, 1968; Taylor, 1969; Chenery and Syrquin, 1975; Chenery et al, 1986; Syrquin and Chenery, 1989). Initial patterns were hypothesised from long-term time-series of sectoral distributions of Gross National Product (GNP) and sectoral labour force share in the OICs. Later, when Kuznets (1957) sought to confirm this hypothesis for all countries, an international cross-section was used, which employed data for several years for each country. His assumption was that a snapshot of each economy provided a full portrait of world industrialisation, since 'common transnational patterns' (p. 25) were assumed to underlie the process. Regression analyses were used by later development economists to model the expected patterns, usually with labour force share or sectoral GNP share as the predicted variable. The 'independent', or given, variables generally included income (as estimated by GNP per capita) and population. More complex equations sometimes included urbanisation estimates and measures of trade openness (see Pandit and Casetti, 1989: 336 for some examples).

As time-series data accumulated, the naivety of expecting identical time-series across economies was demonstrated (Kuznets, 1971; Syrquin, 1988). Kuznets (1971), found that cross-section estimates for GNP by sector underestimated the agricultural

sector's decline and the industrial and service sectors' growth, especially in lower income economies. He concluded that cross-section samples underestimated an acceleration in rates of industrialisation (p. 198). Cross-section estimates of labour force share found, on the other hand, that industrial labour force growth size was over-estimated, and that GNP growth under-estimated (p. 275-296). In short, industrialisation was more rapid, but produced a smaller industrial labour force, and was associated with lower national incomes.

Kuznets was hesitant to interpret these results, given the difficulties of defining the labour force in LICs, but speculated that population growth pressure and poor employment markets affected the hypothesised pattern. Population growth can slow the emergence of industrial production in several ways. An increase in dependent children means basic needs are of continued importance, both lowering the demand for industrial products, and raising the need for continued subsistence activity. More importantly, the unexpectedly large labour force can lower the need to pay high wages, and reduce labour's movement into industrial production. However, the data also fit the common hypothesis that productivity growth affects employment in late industrialisers. New technology allows the rate of structural transformation to increase relative to early OIC rates, but with less associated labour input (ex: Reynolds, 1965; Baer and Herve, 1966; Morawetz, 1974). Industry still becomes the leading sector in output, but increased capital-intensity inhibits employment levels and related pay levels. Kuznets concluded that the observed limitation of cross-section analysis, namely its inability to capture technology and institutional changes, could also be its strength. That is to say, discrepancies in successive cross-section analyses could be a proxy measure for technology and

institutional changes (Syrquin, 1988).

Chenery and Syrquin (1975), then Syrquin and Chenery (1989) also measured discrepancies between cross-section estimates and time-series observations. They acknowledged the value of using both techniques to estimate technology change, but considered overall similarity in predicted patterns more important. Eckhaus (1978) was critical of this 1975 dismissal of intercountry differences. He questioned the validity of expecting a universal pattern of development, and several assumptions of the 'universal factors' in particular. According to Eckhaus, Chenery and Syrquin (1975) failed to test the most important hypothesis; that of common co-efficients *between* countries. Chenery and Syrquin, however, never doubted the existence of diversity amongst countries, but considered them less important than the stability of the overall pattern, and explainable on a case by case basis (Syrquin, 1988; Syrquin and Chenery, 1989).

This thesis assumes that the discrepancies do not reflect case by case variation, but actual system change, and that they may now represent a measurable effect on the generation and distribution of employment and income. In other words, discrepancies between time-series observations and cross-section analyses represent, not merely changes in minor variables which the chosen technique cannot capture, but a pattern of change in the system itself (industrialisation). Both the *intensity* of structural transformation as well as its overall *pattern* determine the distribution of the industry-related share of national product. Intensity refers here to the relative size of the workforce, the duration of its growth and its maximum size, and its income. Pattern refers to the distribution of sectoral activity, both by product and by labour force share.

II. Applying Cross-Sectional Analyses to Time Series Data

Two separate studies are used to estimate changes in the intensity and pattern of structural transformation. In the first (chapters 3 and 4), a cross-sectional study extends and modifies earlier work on sectoral labour force change by Pandit and Casetti (1989), utilising new data estimates which include more recent years. In chapters 5 and 6, a series of cross-sectional views of time-series data are examined for selected countries. Evidence of change in pay levels, knowledge-intensity and capital-intensity levels, and differences in participation is sought. To facilitate this, a general grouping of countries is made on the basis of labour force structure, in order to identify benchmark years for the cross-sections.

A. Rationale for Country Selection

Pandit and Casetti (1989) used a set of 95 countries, which is maintained here to make the two tests as comparable as possible. Libya is excluded from the new sample, however, due to a lack of GDP data. Five groups of countries were excluded from Pandit and Casetti's original study: first, those lacking data (which also included most countries with centrally-planned economies); second, the remaining centrally-planned economies, excepting the more market-based Yugoslavia; third, those with fewer than two million people, which were seen as having abnormally highly trade-based economies; fourth the city-states of Hong Kong and Singapore, which experienced little agricultural to industrial change; and fifth, two remaining countries, the oil-exporting Kuwait and Saudi Arabia. In sum, countries were excluded on the basis of having anomalous economic structures, different defining criteria for labour force and economic activity, or both. Countries and data for the 1989 study are listed in Appendix I.

One difficulty with the use of countries as cases, in statistical analyses, is the assumption that each case is of equal importance. This means that India, with close to a billion people, is accorded the same weight as Norway, with four million, in estimating the world's labour force patterns. If data are weighted by population however[1], substantial differences between unweighted and weighted cases can be seen (table 3-1). For example, the size of the agricultural labour force is underestimated, while the average contribution of industry to GDP is also underestimated. This indicates that the level of labour participation in the 'engine of growth' of industry is over-estimated in an unweighted study. To counter these limitations, the study is repeated with and without population weights. As will be seen, this adjustment is still of limited benefit, since weighted data continue to mask regional variations within large countries.

Two key questions were addressed in Pandit and Casetti's original study: 1) is there evidence of an orderly drift in sectoral change over time, and 2) if there is, can the changing relationship recreate the trends experienced by early and late developers? The second question thus resulted in a discussion of the change over time established by the first question.

The purpose of repeating the study is twofold. First, revised GDP and labour force data are available, which also extend the study time from 1980 to 1990. Second, the 18 years since 1980 have seen the widespread adoption of the structural adjustment programmes of the International Monetary Fund (IMF) in LICs, restructuring policies with respect to free trade, and government subsidisation and regulation in OICs. With

---

1 Note that population was chosen over total labour force because data were not available for 1960.

Table 3-1 Weighted and Unweighted Data for Labour Force and Income Measures

	Weighted (maximum N = 2.49 b)			Unweighted (maximum cases = 209)		
Variable[2]	Mean %	Standard Deviation	population in billions	Mean %	Standard Deviation	number of countries
Labour Force in Agriculture	48.80	27.09	2.49	37.13	28.42	175
Labour Force in Industry	20.08	9.45	2.49	22.07	11.72	175
Labour Force in Services	31.12	19.74	2.49	40.79	19.71	175
Proportion of the Industrial labour force in Manufacturing[3]	71.63	10.10	2.49	62.21	17.18	175
GDP from industry	35.80	10.91	2.31	29.94	11.65	132
GDP from manufacturing	24.64	10.22	2.26	16.51	8.31	117
GNP per capita	3990	7399	2.34	4855	7330	148
GDP per capita, Penn World Tables Estimate (adjusted for purchasing power parity and local preferences)	5711	6050	1.41	5037	5186	84

2 Data are from the International Labour Organisation (1995a), World Bank (1997), and Penn World Tables Mark 5.6 (1992).

3 The industrial sector includes mining, quarrying, manufacturing, and construction work, of which manufacturing is usually the vast majority. A small number of industrial countries, however have higher activity in mining and quarrying.

such adjustments, recent economic growth should have been more export-led in all countries, and more labour-intensive in agricultural and industrial activity in LICs. Therefore, new types of sectoral labour shift may be visible after 1980.

B. The Expansion Method Paradigm

Pandit and Casetti (1989) use Casetti's (1972) *expansion method paradigm*, which was designed by Casetti (1972) to test the stability of simple modelled relationships in different contexts. In this case, the simple relationship is the Fisher-Clark hypothesis, and the differing context is time. The underlying assumption of Casetti's expansion method is that social science models are actually portraits of subsystems which vary in different contexts. Pandit and Casetti therefore assume that the structural transformation patterns are part of a larger social process, which itself varies over time.

The expansion method paradigm is conceptually quite simple. An initial mathematical model, designed to capture an hypothesised subsystem, is modified. Its parameters are altered by expanding them as a linear function of a variable (or variables) representing an hypothesised change in that subsystem's context. The resulting 'terminal model' thus includes the initial variables expressed as the function of these new variables. For example,

$y = a + bx$, where parameter x varies in context z, so that
$x = x_0 + x_1 z$, results in the terminal model
$y = a_0 + a_1 z + [b_0 x + b_1 xz]$.

Usually a linear relationship is adequate to capture variation, even if it is not necessarily the best model of its detailed pattern (Casetti, 1972). Pandit and Casetti chose the simple multivariate regression equation below, first used by Taylor (1969), rather than more complex multivariate models. Complex models include more independent variables,

such as level of urbanisation, and population. While such models are strengthened by the inclusion of other features of structural transformation, additional data requirements also reduce the size of the potential sample set. Furthermore, the detail they add is unnecessary here for capturing the existence of change according to time (Pandit, 1987).

Employment shares were thus related to per capita income by the equations:

$$\ln A = a + b(\ln Y) + c(\ln Y)^2 + E_A \quad (3.1)$$

$$\ln M = p + q(\ln Y) + r(\ln Y)^2 + E_M \quad (3.2)$$

where: A = percentage share of labour in agriculture
M = percentage share of labour in industry
Y = per capita GNP,
E = error, and
a, b, c, p, q, and r are the estimated co-efficients.

In their rationale for the model's specifics, the exponential term, $(\ln Y)^2$, allows the capture of observed non-linear patterns in sectoral share change. Agricultural labour force share declines exponentially, while the industrial labour force rises and then declines. The use of logarithms for GNP per capita, reduces the impact of large values, and the use of logarithms for labour force eliminates the possibility of estimating negative labour force values (Pandit and Casetti, 1989: 336). The service sector was treated as residual.

$$S = 100 - (A + M) \quad (3.3)$$

Expansion equations for the terminal model redefine the parameters as linear functions of time (t), where

$$a = a_0 + a_1 t$$
$$b = b_0 + b_1 t$$
$$c = c_0 + c_1 t$$
$$p = p_0 + p_1 t$$
$$q = q_0 + q_1 t$$
$$r = r_0 + r_1 t,$$

giving the final multivariate equations (with each expanded term shown in brackets),

$$_{ln}A = [a_0 + a_1t] + [b_0(_{ln}Y) + b_1t(_{ln}Y)] + [c_0(_{ln}Y)^2 + c_1t(_{ln}Y)^2] + E_A \quad (3.4)$$

$$_{ln}M = [p_0 + p_1t] + [q_0(_{ln}Y) + q_1t(_{ln}Y)] + [r_0(_{ln}Y)^2 + r_1t(_{ln}Y)^2] + E_M. \quad (3.5)$$

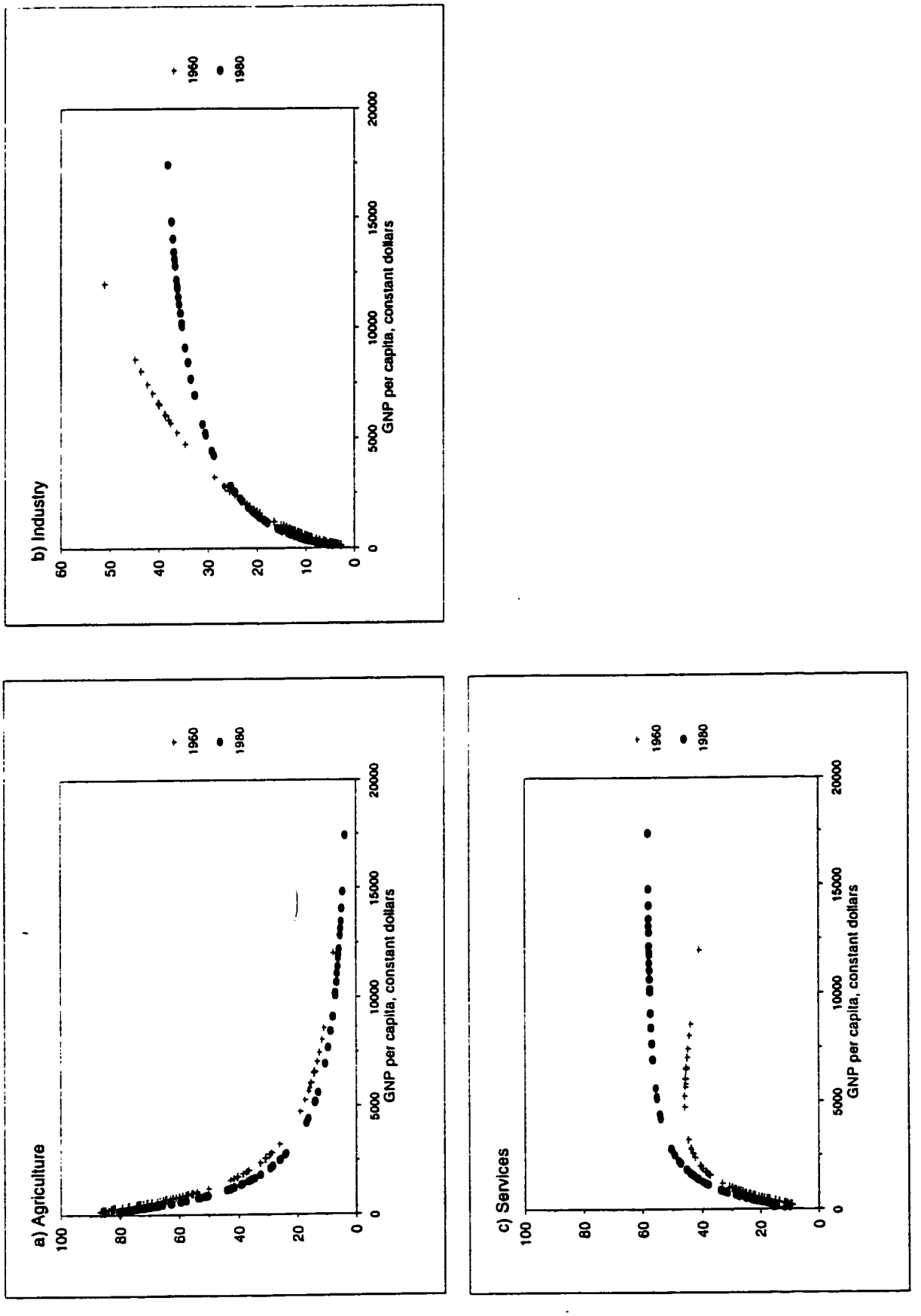
Independent variables are thus expanded from two to five and include t, lnY, t(lnY), $(lnY)^2$, and $t(lnY^2)$. New co-efficients are estimated by running the regression equation on the combined data for all sample years with the time-modified variables. Time is set to equal 0, 10, 20, and 30, to correspond with 1960, 1970, 1980 and 1990. If any of the coefficients from a_1 through r_1 are significant, temporal drift is confirmed.

When originally applied to data for 1960, 1970, 1977, and 1980, the model produced a significant, new, time-modified variable for both agricultural labour force change and industrial labour force change (figure 3-1). Predicted values based on the terminal model confirmed that the agricultural labour force declines more rapidly in later years, the industrial labour force rises more slowly, while the service (or residual) labour force increases more rapidly with increases in GNP per capita (figures 3-1a to 3-1c). These observations are congruent with rising capital-intensity, but also rising population, and the declining social position of waged labour in general. In re-applying equations 3.4 and 3.5 to new data covering 1960 to 1990, the presence or absence of significant co-efficients for the time-modified variables indicates that temporal drift is still present.

1. Considerations Regarding Model Selection

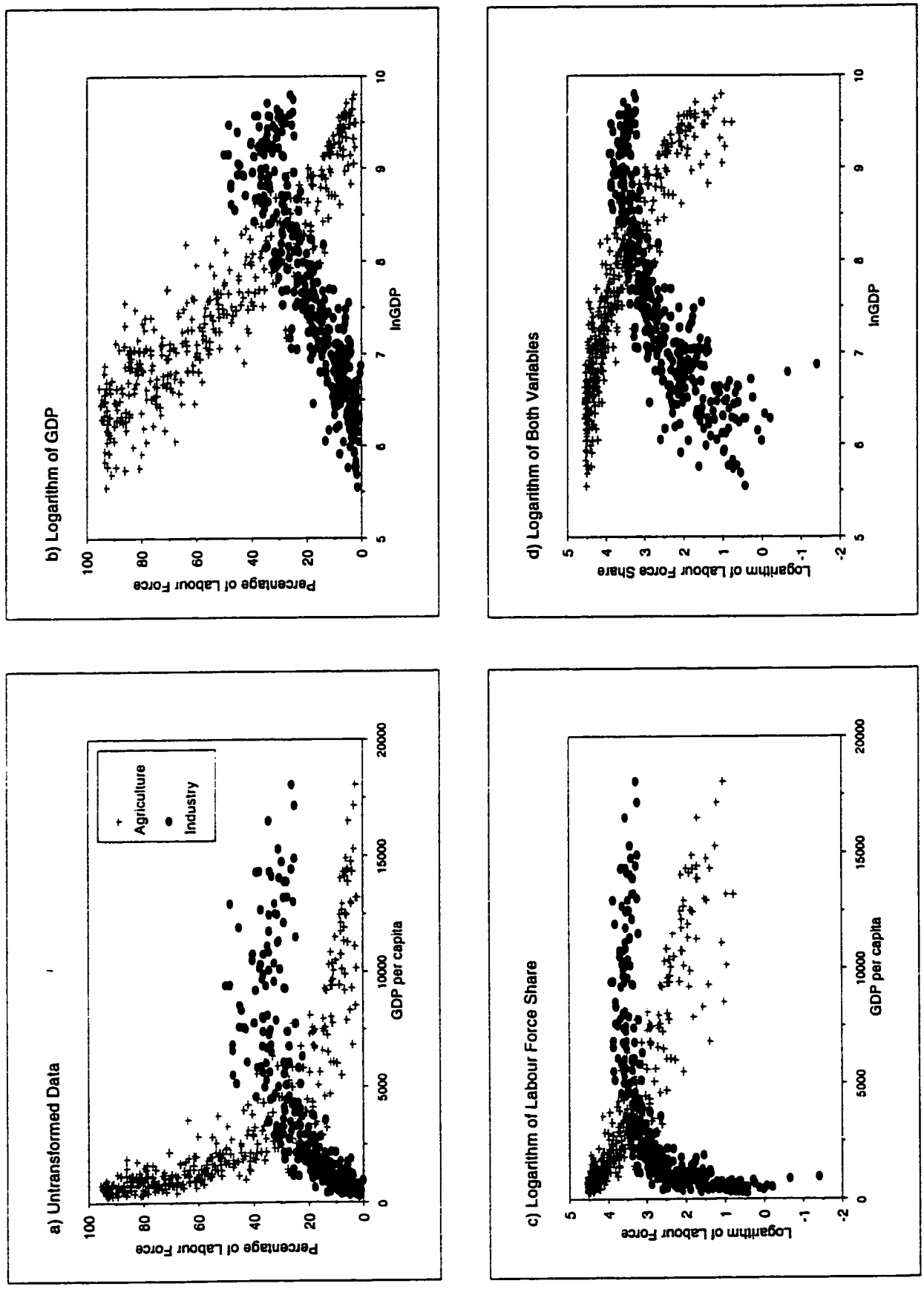
Some comments about the theoretical value of the model equation should be made to clarify the meaning of the overall results. Raw data, both in untransformed and transformed states, are shown in figure 3-2a to d. Pandit and Casetti (1989) chose a double-log, quadratic equation (figure 3-2d) for the reasons stated above, but their

Figure 3-1 Predicted Values for Sectoral Labour Force Share versus GNP per capita in Pandit and Casetti's Original Study



Data Source: World Bank (1983)

Figure 3-2 Labour Force versus GDP per capita: Various Data Transformations



Data Sources: Penn World Tables, Mark 5.2 (1992), ILO (1995a)

Data: Penn World Tables, Mark 5.6 (1992); ILO (1995a)

restriction of eliminating negative value predictions does not apply here. No further application in a time-series model is planned. In other work, Pandit (1987, 1992) preferred the following exponential model

$$\text{Agricultural Labour Force} = e^{a+bY} \quad 3.7$$

$$\text{Industrial Labour Force} = e^{a+bY+cY^{**}2}. \quad 3.8$$

which were transformed to linear equations by taking the logarithm of each side of the equation.

$$\ln(\text{Agricultural Labour Force}) = a + bY \quad 3.9$$

$$\ln(\text{Industrial Labour Force}) = a + bY + cY^2. \quad 3.10$$

While these produced a greater number of significant time-modified parameters in the terminal model, the predictions were a visibly poorer fit for the industrial data when graphed. Specifically, the industrial labour force was over-estimated at its peak, and underestimated at high GNP values.

Chenery and Syrquin (1975; 1989) used a semi-log model (which also included population as an 'independent' variable. The dependent variable was unmodified, but income and other independent variables were expressed as logarithms:

$$\text{Agricultural Labour Force} = a + b(\ln Y) + c(\ln Y)^2 + d(\ln N) + e(\ln N)^2 \quad 3.11$$

$$\text{Industrial Labour Force} = a + b(\ln Y) + c(\ln Y)^2 + d(\ln N) + e(\ln N)^2 \quad 3.12$$

Their choice was influenced by several years of testing various models, in which they found this simplified model an adequate substitute for the more complex *logistic* model (Chenery and Syrquin, 1975: 16-17). The logistic, or S-shaped curve, is commonly used in the biological sciences to measure growth, and the labour force data show a logistic pattern graphed against the logarithm of GDP per capita (figure 3-2b). Since dependent variables were expressed as ratios (i.e., labour force share, GDP share), Chenery and

Syrquin (1975, 1989) left them untransformed. This allowed comparable estimates when models were used on components of an aggregate (p. 17; Syrquin and Chenery, 1989: 148). Despite these considerations, the double-log model is used here, to maintain comparability with the original study.

Since the type of models used in structural transformation studies vary, it is useful here to be explicit about the assumptions of the equations employed, so that decisions made by earlier studies are obvious. Structural transformation models are more a means of capturing existing economic patterns than an actual measure of the transformation process. Because all of the equations mentioned have limitations in modelling the complex data patterns, the goal of the study is to measure the change in the fit over time, rather than to create the ideal fit. At the simplest level, the model states that sectoral labour force share and GDP per capita are interrelated:

$$LF = a + b(GDP).$$

By introducing an exponential term, which Chenery and Taylor first did in a 1968 study, a parabolic relationship is assumed, in which the relationship between labour force share and income is reversed over time. While this reversal is visible for the industrial labour force, it does not make logical sense for the agricultural labour force. It shows neither a reversal in trend at high GDP, nor a smaller labour force at low GDP per capita. The parabolic curve is merely a means of capturing a less pronounced relationship between GDP and agricultural labour force change at high *or* low GDP per capita levels. It is worth noting that the rate of change is lower at both GDP extremes (figure 3-2a), but that this pattern can only be captured by a quadratic equation at one extreme. In the semi-log and double-log models, the parabola peaks at lower incomes, at least in theory. In

actuality, the semi-log model applied to agriculture produces an almost straight line for the predicted values, as the data in figure 3-2b show. When logarithmic transformations are not used, the parabola shows a trough at high incomes for agriculture. For industrial labour force data, the parabolic pattern is seen in both the predicted and actual data.

Since logarithmic transformations are used to indicate the presence of continuous change in the relationship between two variables, transforming both variables in the double-log model reflects the assumption that changes in *each* variable affects the relationship to the other (figure 3-2d). For example, less change in labour force share is seen at higher GDP per capita, especially for agriculture, and the logarithmic transformation of GDP produces a straight line relationship. By adding a logarithmic transformation of labour force, the equation also assumes that change is less rapid at high labour force share values. This is not clearly visible for either agriculture or industry (figure 3-2c). So, while the model assumes continuous change in the relationship with changes in both variables (which is not theoretically unfeasible), it is difficult to see such a change with the logarithmic transformation. The chosen model thus reflects observed patterns less than the semi-log model.

C. Data Set Changes

Extending and modifying Pandit and Casetti's study allows the use of new, more accurate estimates for labour force and GDP per capita, and extends the time period studied to 1990 from 1980. Estimates of GDP and labour force share by international agencies are regularly recalculated as new data and knowledge emerge. The International

Labour Organization's (ILO, 1995a-d) fourth estimate of labour force values[4], and the Penn World Tables, Mark 5.6 (1992) estimates for Gross Domestic Product per capita are thus used. Labour force data for 175 countries cases plus existing GDP data are listed in Appendix II.

However, changing the data introduces two complications in what would otherwise be a simple extension of the earlier work. Since the new labour force estimates are for 10 year intervals instead of five year intervals, the number of data points in the final data set is actually reduced, even though the time span is extended. Unfortunately, labour force estimates for 1950, available for the first time, cannot be used, because comparable GDP estimates are missing for most of the younger nation-states. Therefore, there are data for 94 of the 95 original countries for 1960, 1970, 1980, and 1990 for a total of about[5] 376 cases. By contrast, the data for the original study were for five periods over twenty years for a total of about 475 cases. As will be seen, this reduction adversely affects the significance of the final study.

A second complication is in the actual change in values for the data. This effectively means that it is not possible to compare the details of the two studies. Each study is a unique estimate of hypothesised shifts in the pattern of structural transformation.

---

4 The Study uses the preliminary release of the labour force estimates published in the *Bulletin of Labour Statistics*, 1995: volumes 1-4. Final estimates are published as of December 1996, but were not readily available. The final estimates were not expected to vary significantly (International Labour Organization, 1995a).

5 There was ICP estimate for Libya's GDP and there are also missing values for some countries for specific years.

III. Summary

The method used by Pandit and Casetti's (1989) in study of changing structural transformation processes is extended and modified with new data, and two new tests. The original work found a significant shift in the pattern of both agricultural and industrial labour force change over time. To test for a continuation and acceleration of this shift, new and better estimates of labour force share and GDP per capita are used, and the time frame examined is extended by 10 years to 1990. A specific examination of accelerated change between 1980 and 1990 is justified through the observation that industrial and economic policy have shifted since the late 1970s. In addition, worldwide labour force share is estimated both with and without population weights and found to produce significant difference in the relationship between weights for population. Preliminary examinations of weighted versus unweighted data indicate that general estimates of industrial labour force versus industrial GDP levels are overestimated with unweighted data. This justifies a second examination of the shift, which allows a comparison between weighted and unweighted data.

A double-log equation measuring the correlation between GDP per capita and labour force share will be employed to estimate the social impact of industrialisation. A large industrial labour force is seen as representing a greater social impact. Data utilised in the original estimate include labour force share and GDP estimates for all sampling periods over 30 years. The shift of any social impact is then estimated by using Casetti's (1972) *expansion method paradigm*. Here, the dependent variables for labour force share are modified by expanding each value by a linear equation capturing change over time. The assumption behind the expansion method paradigm is that social science models

actually measure social subsystems, which vary in different contexts. Structural transformation is assumed to be a subsystem of a larger process, and variable over time.

The specific model equation and country sample chosen replicate Pandit and Casetti's. Any model of structural transformation is limited, and captures only a few variables known to affect the process. The simple model used here should not be seen as an attempt to find an ideal fit for the data, but a simple estimate of a complex relationship, whose change in fit can be measured over time through the expansion method paradigm.

CHAPTER 4

RESULTS I: LABOUR FORCE CROSS-SECTION ANALYSIS

I. Changes in Data and Implication

A. Labour Force Estimates

Pandit and Casetti's original study used both GNP per capita data and labour force data from the 1983 version of the World Bank's *World Tables*. World Bank labour force statistics were based on the International Labour Organisation's (ILO) third estimate of labour force structure, with adjustments from internal World Bank data. The most recent ILO estimates were made in 1995, and improve on earlier estimates. Individual projection models are used for each country rather than general models, and estimates are adjusted to include women who are 'unpaid family workers', where cultural norms exclude them from national statistics (ILO, 1995a).

Changes for the two labour force data sets are summarised in table 4-1, based on the common years of 1960, 1970, and 1980. Note that the means here are from the sample subset of 95 countries used by Pandit and Casetti, and thus differ from those in table 3-1 (p. 70). In particular, China is absent, which reduces the previously observed rise in the weighted means for agricultural activity. A case by case examination in the differences in estimates also confirms that the new data have a greater number of higher estimates for agriculture, and a greater number of lower estimates for industry. Since data are non-normal, a Wilcoxon signed rank test is run on both data sets to test for non-random differences between the estimates. Table 4-2 confirms that the distribution of data values from highest to lowest is significantly different between estimates for

Table 4-1 Labour Force Data Comparisons: World Bank 1983 vs ILO 1995

Sector	Mean Labour Force Activity Rate %	Number of Countries	Mean Weighted by Population %	Population in millions[1]
Agriculture				
World Bank 1983 estimate	52.93	284	48.62	7113
ILO 1995 estimate	54.25	285	49.34	7135
Percentage of World Bank Estimates which are lower than ILO estimates	41.40	P=0.01%	n/a	
Industry				
World Bank 1983 estimate	19.13	284	21.00	7113
ILO 1995 estimate	18.18	285	20.35	7135
Percentage of World Bank Estimates which are lower than ILO estimates	37.89	P<0.00%	n/a	

1 Note that the population total is cumulative over 1960 to 1980, and therefore exceeds the world total.

Table 4-2 Comparisons of Labour Force Data: Wilcoxan Signed Rank Test

Sector	Number of Cases where World Bank 1983 values lower than ILO Estimates	Number of Cases where World Bank 1983 values higher than ILO Estimates	Tied values	Total Number of Comparable Cases	Significance of 2-tailed P
Agriculture	162	117	5	284	0.0001
Industry	106	176	2	284	0.0000

agriculture and industry. In other words, the relative positions of countries with respect to labour force and income values have been altered with the new estimates.

B. Gross Domestic Product Estimates

Penn World Tables (PWT) estimates are used for GDP per capita, instead of the most recent World Bank data for several reasons. Recent per capita GNP estimates from the World Bank are no longer available in constant US dollars, and the existing gross GNP estimates are missing values for many of the original 95 countries. Furthermore, PWT data are part of a long term United Nations project to compile data specifically designed for international comparisons (Summers and Heston, 1991). While data were missing for 1990 for 13 countries, for 12 of these, data from 1986 to 1989 were available[2]. This was considered a valid substitution in estimating general patterns, since the labour force difference between these years and 1990 would be minor. In most cases, the lack of GDP data was for 1990 and later years only, due to recent political turmoil, while the trend estimates of the ILO are based on longer term patterns. It is assumed here that labour force data are less reflective of year to year fluctuations.

PWT data are obtained by using the benchmark studies of the United Nations International Comparison Programme (ICP) and interpolating inter-spatially to other countries, and inter-temporally to other years (Summers and Heston, 1991: 328). The ICP estimate itself is based on purchasing power parity (PPP), and considers 1) the prices of identically specified goods and services, comprising the GDP, and 2) variations in

---

[2] The following countries have GDP data from the years indicated for 1990: Angola (1989), Ethiopia (1986), Haiti (1989), Liberia (1986), Myanmar (1989), Nepal (1986), Niger (1989), Somalia (1989), Tanzania (1988), Yemen (1989), Zaire (1989), and Sudan has 1961 data for 1960. Libya had no GDP data so it had to be dropped from the study.

international expenditure patterns. The GDP per capita estimate used is expressed in constant (1985) international dollars, and the calculation incorporates a chain index, which estimates relative price changes over time. Changing expenditure patterns are thus also incorporated, which reduces the normal deterioration in the value of estimates with distance from the base year (Summers and Heston, 1991: 344).

Though PWT estimates are for GDP per capita rather than GNP per capita, the overall range and distribution of high to low values is not radically altered by this change. It should be noted, though, that while GDP versus GNP differences are not significant for this study, they can be useful indicators of the difference between income held abroad and domestic production. This distribution has shifted in the last few decades with the rise of multinational companies. The difference between PWT GDP estimates and World Bank GDP estimates is, not surprisingly, more pronounced than that between the World Bank estimates for GDP and GNP. PWT data are meant to be a modification of national figures. GNP data for the 1989 study and PWT data are not strictly comparable, since both the method of estimation and base year used is different. Nevertheless, there is a difference in pattern and distribution between the two measures. When data are ranked, and then compared by group using the Wilcoxon signed rank test, semi-industrialised countries tend to have relatively higher GDP per capita values in the PWT data, while OICs have relatively lower GDP per capita values (table 4-3).

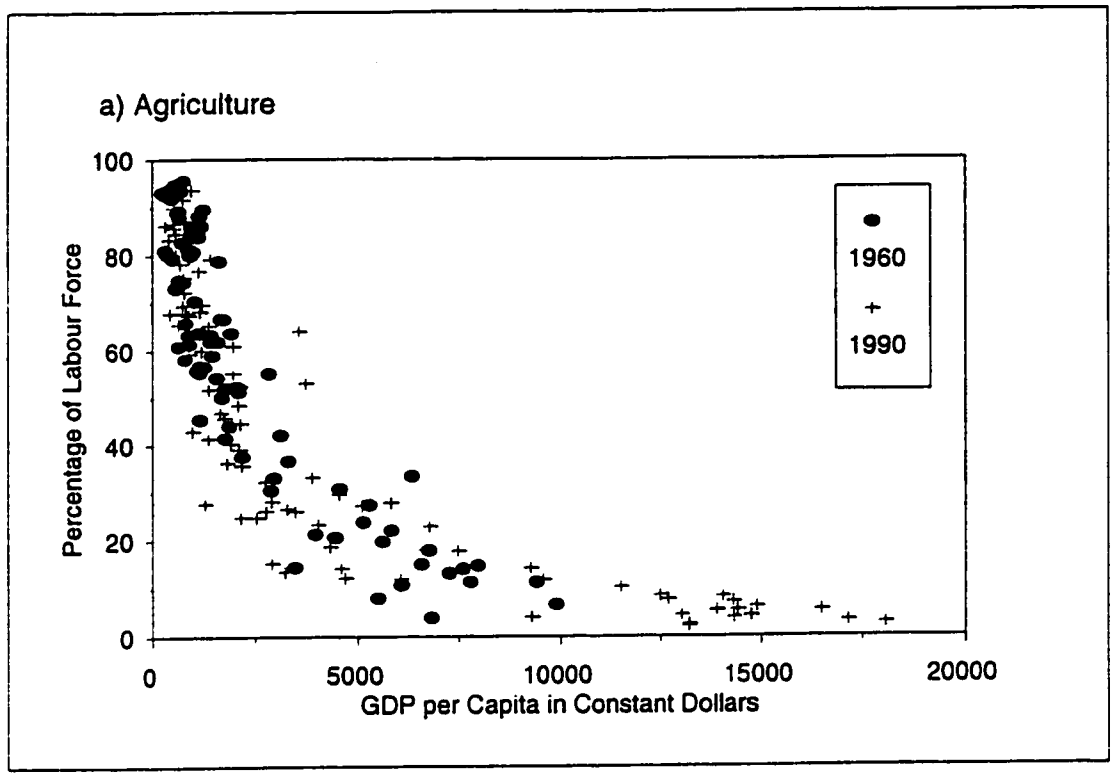
A look at the raw data values for 1960 and 1990 (figure 4-1a,b) shows a clear difference in distribution for industry, and a less visible one for agriculture. Two notable differences for the 1990 agricultural labour force are the number of countries with very high GDP per capita values and low labour force shares, and smaller labour force shares

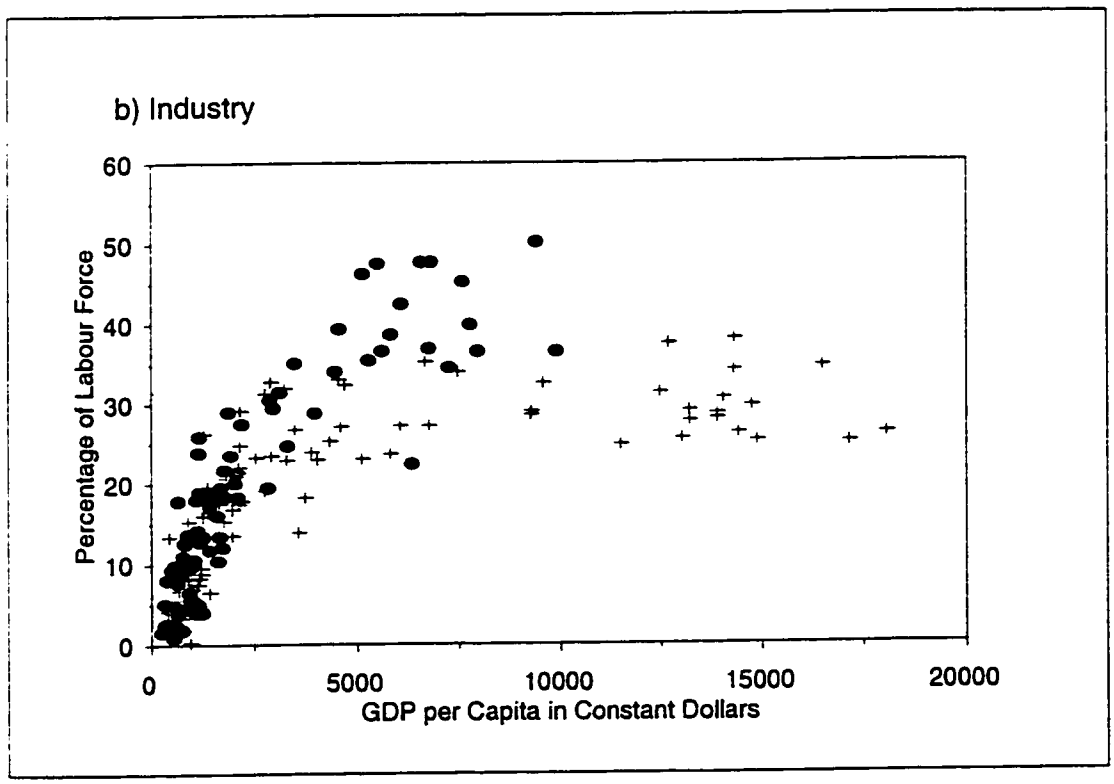
Table 4-3 Variations in Data Ranks between Income Estimates for 1960, 1970, and 1980: Penn World Tables versus World Bank (1983)

Country Group[3]	World Bank 1983 estimate is lower	World Bank 1983 estimate is higher	Tie	Number of Countries	Significance of 2-tailed test
Total	139	133	5	277	0.3939
Less Industrialised Countries and Rapidly Industrialised Countries	79	69	2	144	0.9862
Semi-Industrialised Countries	23	10	1	34	0.0159
Newly Industrialised Countries	29	24	1	54	0.4625
Older Industrialised Countries	14	30	1	45	0.0435

[3] Country Groups are based in labour force distribution and defined in Chapter 5.

Figure 4-1 Sectoral Labour Force vs GDP per Capita (constant dollars): 1960 and 1990





Data Source: Penn World Tables, Mark 5.6 (1992); ILO (1995a)

at intermediate GDP per capita levels. One other notable pattern is the uneven distribution of variance. Variation in labour force values for agriculture is greater in the middle GDP ranges, compared to those at the very lowest and very highest GDPs.

Industrial labour force change over time is far more visible, with 1990 values considerably lower both at medium and high GDP per capita values. Uneven distribution in variance is also more pronounced, with values becoming more variable at increased GDP per capita. Such non-random patterns of variance reduce the strength of linear models, though the logarithmic transformation of the dependent variables reduced their impact in this model.

II. Sectoral Shifts from 1960 to 1990

A. Simple Double-log Model, All Years, No Population Weight

Three versions of the double-log model were used on the new data, and also replicated for the original data set: a step-wise model, a default 'enter' model where all variables were incorporated together, and models using data weighted by population. The linear regression procedure from SPSS 6.1 was used with an F-statistic probability for the variable set at 0.05 for entry, and 0.10 for removal. Missing values were omitted on a case by case basis. Results for both the original Pandit and Casetti study and new data (unweighted) are summarised in table 4-4 with significant time-modified variables highlighted in bold type. As was done in the original study, only the presence or absence of significant time-modified variables is considered of importance, since the sign and value of the various parameters in the expanded equation may compensate for each other (Pandit and Casetti, 1989: 337).

Table 4-4 Model Results: Original and New Data

$$_{ln}LABOURFORCE = a_{(i)} + a_1 time + b_{(i)}(_{ln}GDP) + b_1 time(_{ln}GDP)] + c_{(i)}(_{ln}GDP)^2 + c_1 time(_{ln}GDP)^2] + E_A$$

		Original Data				New Data			
		Agriculture		Industry		Agriculture		Industry	
Model	Variable	Parameter	Prob.	Parameter	Prob.	Parameter	Prob.	Parameter	Prob.
Static	lnGDP	1.295	0.000	1.437	.0000	2.469	.0000	4.211	.0000
	$(lnGDP)^2$	-0.130	.0000	-0.065	.0000	-0.221	.0000	-0.223	.0000
	constant	1.201	.0098	-4.057	.0000	-3.460	.0000	-16.330	.0000
	R^2	.855		.664		.894		.723	
Terminal	time	-0.015	.4440	0.0141	.6193	-0.007	.2019	**0.021**	**.0233**
	lnGDP	1.165	.0000	1.232	.0000	2.686	.0000	3.852	.0000
	t(lnGDP)	0.006	.3320	0.007	.4555				
	$(lnGDP)^2$	-0.011	.0000	-0.044	.0058	-0.225	.0000	-0.192	.0000
	t $(lnGDP)^2$	-0.0005	.1581	-0.001	.1127	.00008	.3600	**-4.081**	**.0082**
	constant	0.512	.0021	-3.725	.0000	-3.503	.0001	-15.326	.0000
	R^2	.860		.677		.895		.729	
Stepwise	time			**.0343**	**.0000**	same as static		same as static	
	lnGDP	1.247	.0000	1.310	.0000				
	t(lnGDP)								
	$(lnGDP)^2$	-0.125	.0000	-0.050	.0004				
	t $(lnGDP)^2$	**-.0002**	**.0001**	**-5.830**	**.0004**				
	constant	1.348	.0034	-3.973	.0000				
	R^2	.859		.676					

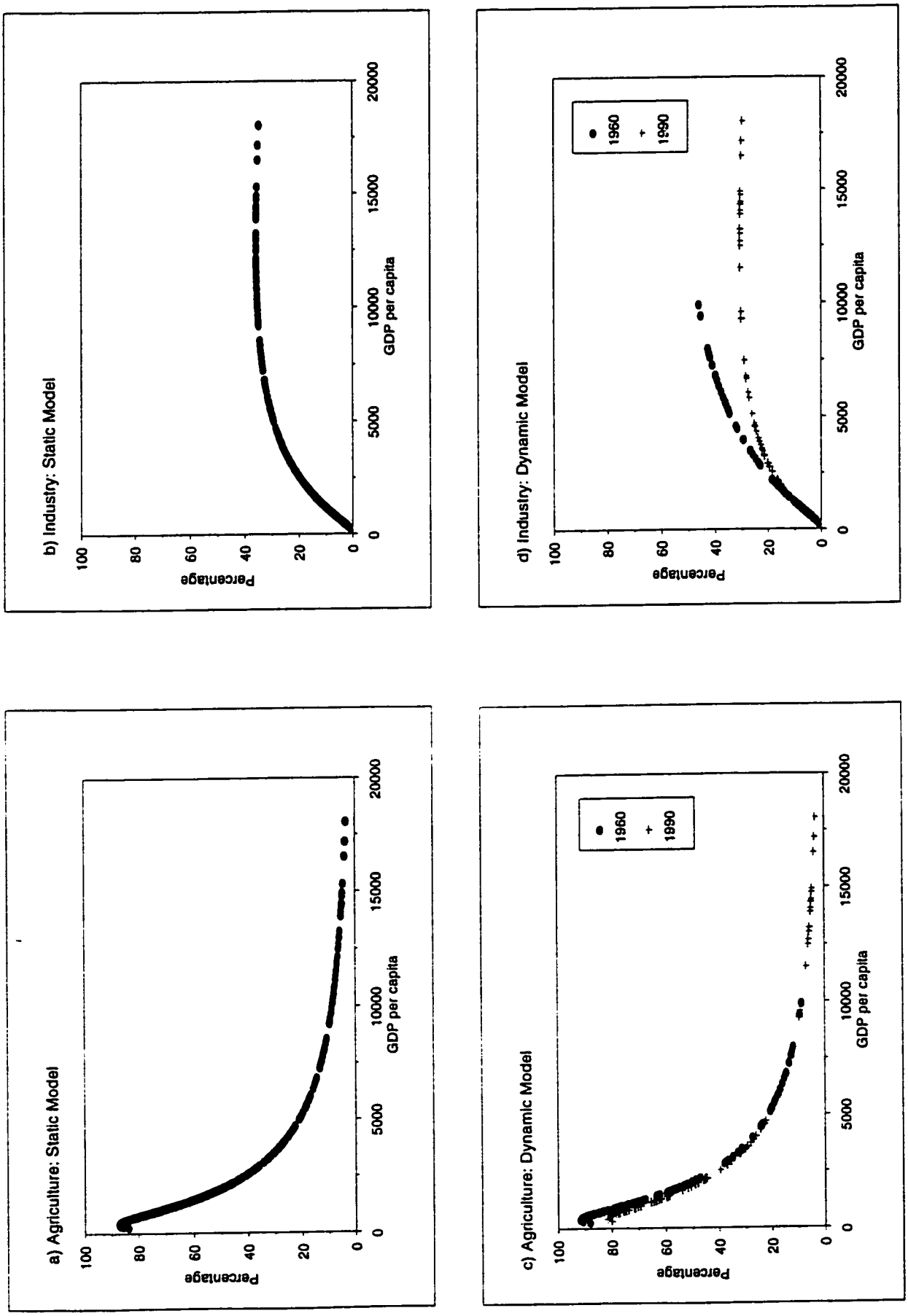
One significant, time-modified variable does appear with the new data for the industry model. Despite the absence of a significant time-modified parameter in the agriculture model, the presence of one significant variable in any sector confirms a significant shift in overall sectoral transformation patterns. Time-modified variables are not entered in either of the stepwise models, though. So, while a shift in structural transformation patterns can still be captured, it is harder to capture with the new data. In part, this is seen to be the result of an overall reduction in the number of cases.

There are several possible explanations for the less powerful model. One is the change in pattern of the new data, which estimates a larger agricultural labour force, and a smaller industrial labour force in earlier decades. Overall, this data set describes a smaller degree of structural transformation than was estimated by the previous World Bank set. Neither structural transformation, nor the shift in structural transformation patterns over time has disappeared, but the mathematical model may be rendered less powerful than in the earlier study by being applied to a narrower range of data values.

Another possible cause is the overall reduction in sample size. To test for this effect, the model was re-run for the original data with one year, 1977, eliminated. This ensured that the sample sizes were now roughly equal, but the maximum differences in the *time* variable were preserved. In this modification, no time variables were entered in the stepwise model for industry, and only the model for agriculture produced a significant time-modified variable. Therefore the larger number of cases in the original study contributed significantly to the power of the test.

Graphical views of the static model and time-modified predictions are in figure 4-2 and show some interesting peculiarities, particularly in the agricultural model. (Note

Figure 4-2 Predicted Labour Force Values: Static and Time-Modified Models



that the exponential values of the predictions are graphed against actual GDP for ease of interpretation.) Both the static and dynamic models predict a secondary labour force peak at the lowest GDP per capita levels; this trend is not clear from the raw data in figure 3-2a. The apparent rise at low GDP per capita can be attributed to the limitations of the model equation and the ambiguous relationship between the agricultural labour force and GDP per capita at very low GDP per capita levels. In its double log format, with an exponential term, the model fits the data to a parabola. As mentioned in chapter 3, and indicated by figure 3-2c, the peak is at low GDP per capita values. Thus, the lowest labour force values are fitted to an hypothetical rise to this peak. Actual and predicted labour force values at GDP per capita values of under $500 show a maximum estimate of 87.33 for the static model and 91.76 for the dynamic model compared to 93.54 for the raw data. A general tendency to under predict agriculture labour force share can be seen from the actual and predicted values in table 4-5. A similar pattern in predictions is also visible in the 1989 study. While it would be tempting to interpret this curve, poorer data quality at the lowest GDP levels cannot really support this. It is a limitation of the model.

B. Double-log Model with Weighted Data

As mentioned in chapter 3, there are limitations to using countries as identically weighted cases. Most notable is that the large effect of India on the total labour force pattern is masked. This was demonstrated in table 3-1 (p. 70), where mean labour force shares, based on equally weighted countries, under-estimated the worldwide agricultural labour force and over-estimated the industrial labour force. Countries were therefore weighted by population data from the World Bank's *World Data 1995*, and expressed as multiples of one million. This left Togo (1960) with the minimum weight of 1.5, and

Table 4-5 Error in the Agricultural Labour Force Predictions at Low GDP Values

Country	Year	GDP per capita	Agriculture's Labour Force Share	Predicted Share: Static Model	Error: Static Model	Predicted Share: Time-Modified Model	Error: Time-Modified Model
Ethiopia	1960	257	93.10	83.70	-9.40	88.12	-4.98
Ethiopia	1970	296	91.20	85.64	-5.56	86.43	-4.77
Ethiopia	1990	312	86.18	86.19	0.01	80.08	-6.10
Myanmar	1960	316	80.97	86.30	5.33	90.80	+9.83
Tanzania	1960	319	92.59	86.38	-6.21	90.88	-1.71
Ethiopia	1980	322	89.31	86.46	-2.85	83.78	-5.53
Burundi	1970	341	93.54	86.87	-6.67	87.73	-5.81
Togo	1960	367	80.17	87.20	7.03	91.68	-11.51
Burkina Faso	1970	374	92.00	87.25	-4.75	88.16	-3.84
Malawi	1960	380	93.59	87.29	-6.30	91.76	-1.83
Chad	1990	399	83.22	87.33	4.11	81.64	-1.58
Myanmar	1970	418	78.39	87.29	8.90	88.24	+9.85
Mali	1970	419	92.69	87.28	-5.41	88.23	-4.46
Tanzania	1970	424	90.06	87.26	-2.80	88.21	-1.85
Zaire	1990	424	67.79	87.26	-19.47	81.69	-13.90
Malawi	1970	440	91.45	87.14	-4.31	88.11	-3.34
Burkina Faso	1960	456	91.85	86.98	-4.87	91.33	-0.52
Burkina Faso	1980	457	92.17	86.97	-5.20	84.69	-7.48
Guinea	1970	467	92.25	86.84	-5.41	87.83	-4.42
Zaire	1980	476	71.64	86.72	-15.08	84.50	-12.86
Burundi	1980	480	92.84	86.66	-6.18	84.45	-8.39
Tanzania	1980	480	85.78	86.66	0.88	84.45	-1.33
Zaire	1960	489	79.30	86.52	7.22	90.81	-11.51

India (1990) with the maximum of 845.

However, weighting countries by population also has limitations, since it assumes each country comprises a number of identically structured cases proportional to its population. Therefore the results of the weighted models should be seen as modelling the labour force patterns for the *entire* sample, as a subset of world labour force, rather than a collection of 10,561 countries[4] with populations of about 1 million each. Without the weight correction, the impact of small, industrialising countries on the overall pattern is exaggerated. With the weight correction, variation within countries is still masked, as in the original study. More detailed sub-country data would be ideal, but is not available. Another useful modification would be to replace national income measures with personal income measures which reflected income distribution[5]. Conceivably, this could lower the income estimate for many countries with unequal income distributions, such as the U.S. and Brazil. Such a modification is for a separate study.

Table 4-6 summarises the results of the double-log equations as applied to the weighted data. All of the time-modified variables entered in both the standard and stepwise regression procedures are significant. In Pandit and Cassetti's study, all the time-modified variables were entered in both step-wise and 'enter' style models. Here, one variable is left out as redundant in the unweighted model, once again demonstrating that this test is not as strong. Obviously, the increase in cases resulting from weighting the data increases the significance of the overall test. But the general distribution of the data

---

4 This total is the cumulative sample population for 1960-1990.

5 Some of these data are now more readily available from the United Nation Development Programme's (UNDP) Human Development Index, but do not necessarily have long time- series.

Table 4-6 Model Results: Original and New Data, Weighted by Population

$$_{ln}LABOURFORCE = a_0 + a_1 time + b_0(_{ln}GDP) + b_1 time(_{ln}GDP)] + c_0(_{ln}GDP)^2 + c_1 time(_{ln}GDP)^2] + E_A$$

		Original Data				New Data			
		Agriculture		Industry		Agriculture		Industry	
Model	Variable	Parameter	Prob.	Parameter	Prob.	Parameter	Prob.	Parameter	Prob.
Static	lnGDP	2.116	0.000	0.850	.0000	3.500	.0000	3.362	.0000
	$(lnGDP)^2$	-0.191	.0000	-0.033	.0000	-0.275	.0000	-0.079	.0000
	constant	-1.564	.0000	-1.334	.0000	-6.806	.0000	-12.248	.0000
	R^2	.898		.734		.923		.693	
Terminal	time	-0.015	.0000	0.0080	.0321	-0.0134	.0000	0.0007	.0000
	lnGDP	2.048	.0000	0.6426	.0000	3.734	.0000	3.205	.0000
	t(lnGDP)	0.004	.0010	0.0045	.0001				
	$(lnGDP)^2$	-0.185	.0000	-0.0143	.0000	-0.294	.0000	-0.165	.0000
	t $(lnGDP)^2$	-0.0004	.0000	-0.00007	.0000	0.0002	.0000	0.00002	.0000
	constant	-1.32		-0.889	.0000	-7.477	.0000	-11.780	.0000
	R^2	.901		.744		.925		.703	
Stepwise	time	-0.0144	.0001	0.008	.0321				
	lnGDP	2.048	.0000	0.6426	.0000	3.085	.0000	3.167	.0000
	t(lnGDP)	0.0039	.0010	.0045	.0001	-0.004	.0000	.002	.0000
	$(lnGDP)^2$	-0.185	.0000	-0.014	.0000	-0.299	.0000	-0.163	.0000
	t $(lnGDP)^2$	-0.0004	.0000	-0.00007	.0000	0.0005	.0000	-0.0003	.0000
	constant	-1.32	.0000	0.889	.0000	-7.745		-11.614	.0000
	R^2	.901		.744		.925		.703	

also has an effect. India accounts for about 25% of the new 'cases' and the United States about 8%. As cases, they strongly reflect the generalised relationship between large agriculture labour force share and low GDP per capita. This, in turn, reduces variance, and makes measuring the effect of other variables more feasible. It is notable that if these two countries are removed from the sample for the new data, no significant time variables emerge for agriculture, and significant time-modified variables only emerge in the 'enter' style industry model. Of course, the model is also of little relevance for the measurement of international economic patterns once these two large countries are removed. The modification is merely a means of tracing the source of the improved significance.

Weighted data decrease the accuracy of the model in predicting agricultural shares at the lowest GDP per capita. There is an increase in the number of low GDP per capita countries with under-estimated agricultural activity (figure 4-3; table 4.7). Labour force patterns and shifts at higher GDP per capita are modified very little. The weighted models estimate higher industrial labour force shares at lower GDP per capita, and lower industrial labour force shares at higher GDP per capita. This reflects the large GDP and high service labour force share of the United States in particular (figures 4-3 b,d).

C. Accelerating Changes in Labour Force Share versus GDP Share

One of the hypothesised results expected from the new data was a visible difference between specific time periods, in addition to the general shift over 30 years. As outlined in chapter 1, there is a possibility that labour-cost competition may have increased the amount of labour-intensive, export-oriented production at lower GDP per capita levels. However, production and GDP per capita changes in the 1980s were considerably more complex than this. In many countries, both OICs and others, the

Figure 4-3 Predicted Labour Force: Weighted vs Unweighted Data, Static vs Time-Modified Models

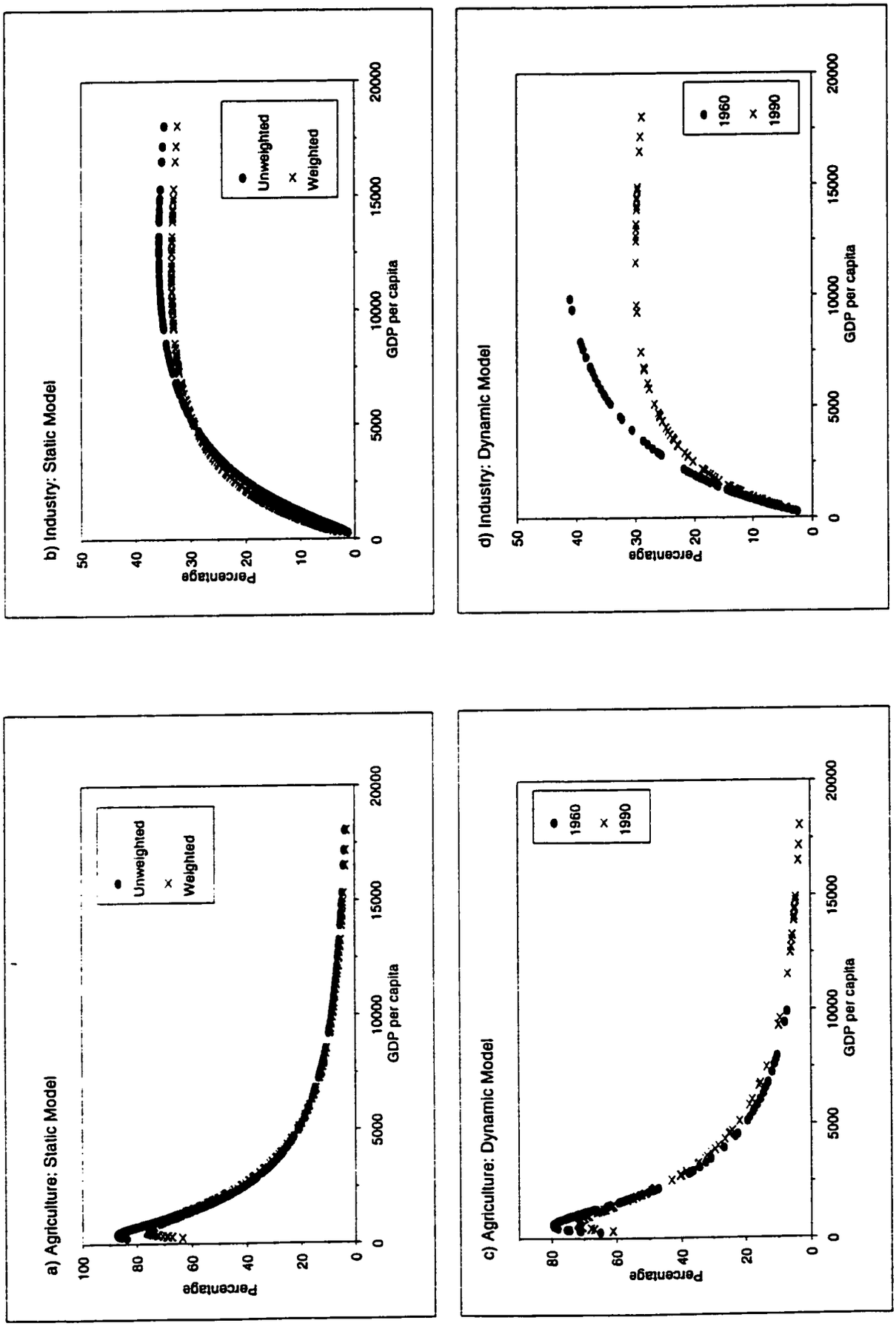


Table 4-7 Error in the Agricultural Labour Force Predictions at Low GDP Values: Weighted Data

Country	Year	GDP per capita	Agriculture's Labour Force Share	Predicted Share: Static Model	Error: Static Model	Predicted Share: Time-Modified Model	Error: Time-Modified Model
Ethiopia	1960	257	93.10	63.57	-29.53	65.02	-28.08
Ethiopia	1970	296	91.20	67.37	-23.83	65.95	-25.25
Ethiopia	1990	312	86.18	68.65	-17.53	61.20	-24.98
Myanmar	1960	316	80.97	68.95	-12.02	71.06	-9.91
Tanzania	1960	319	92.59	69.17	-23.42	71.30	-21.29
Ethiopia	1980	322	89.31	69.38	-19.93	65.04	-24.27
Burundi	1970	341	93.54	70.63	-22.91	69.63	-23.91
Togo	1960	367	80.17	72.06	-8.11	74.58	-5.59
Burkina Faso	1970	374	92.00	72.40	-19.60	71.69	-20.31
Malawi	1960	380	93.59	72.68	-20.91	75.28	-18.31
Chad	1990	399	83.22	73.47	-9.75	66.88	-16.34
Myanmar	1970	418	78.39	74.14	-4.25	73.75	-4.64
Mali	1970	419	92.69	74.17	-18.52	73.79	-18.90
Tanzania	1970	424	90.06	74.33	-15.73	73.98	-16.08
Zaire	1990	424	67.79	74.33	6.54	68.00	0.21
Malawi	1970	440	91.45	74.78	-16.67	74.54	-16.91
Burkina Faso	1960	456	91.85	75.17	-16.68	78.13	-13.72
Burkina Faso	1980	457	92.17	75.19	-16.98	72.07	-20.10
Guinea	1970	467	92.25	75.40	-16.85	75.32	-16.93
Zaire	1980	476	71.64	75.57	3.93	72.60	0.96
Burundi	1980	480	92.84	75.64	-17.20	72.70	-20.14
Tanzania	1980	480	85.78	75.64	-10.14	72.70	-13.08
Zaire	1960	489	79.30	75.78	-3.52	78.83	-.47

combination of debt problems, technical change, and structural reforms often raised overall industrial production and exports, but decreased employment. In other countries, industrial production shrank. Therefore, all that can be tested for is a relative increase in measurable change between 1980 and 1990. Labour force share and GDP per capita data alone may not capture the complexity of change. It is conceivable, for example, for adjustments to industrial structure to result in an overall rise in industrial production combined with falling GDP per capita, falling industrial employment, and a stable or rising industrial labour force, since this would include the unemployed.

To look for general changes, pairs of decades, i.e., 1960-1970, 1970-1980, and 1980-1990, are examined individually to see if significant time-modified variables are entered. In this study, the use of weights is not useful, since the impact of the debt crisis and structural adjustment programmes were spread over many countries, but not focused on India. If India shows a difference in the structural transformation patterns in any decade, 2500 of 10500 cases will be capturing that change. Results for the decade by decade analysis are summarised in table 4-8, which gives the significance of time-modified variables which entered the terminal model. Note that all the variables not entered (indicated by *n/e*) were also not significant, which is not necessarily the case for variables left out of an equation.

As can be seen, the only significant time-modified variable appears between 1980 and 1990 in the agricultural model, indicating that the data shifted more in this decade than in other decades. In addition, the time variable for industry is close to significance, with a probability of error of 7.1%.

Table 4-8 Changes in the Sectoral Labour Force Shift by Decade: Significance of the t-statistic for Time Modified Variables

Sector	Decade	Significance of Time-based Variables: .05 = 5% probability		
		time	time(ln GDP)	time (ln GDP)^2
Agriculture (enter model)	1960-70	0.5368	not entered n/e	0.3943
Agriculture (stepwise model)		n/e	n/e	n/e
Industry (enter model)		0.8147	n/e	0.5765
Industry (stepwise model)		n/e	n/e	n/e
Agriculture (enter model)	1970-80	0.7369	n/e	0.689
Agriculture (stepwise model)		n/e	n/e	n/e
Industry (enter model)		0.8147	n/e	0.5765
Industry (stepwise model)		n/e	n/e	n/e
Agriculture (enter model)	1980-90	0.3363	n/e	0.7465
Agriculture (stepwise model)		**0.0177**	n/e	n/e
Industry (enter model)		0.0712	n/e	0.0951

III. Summary and Conclusion

An examination of the labour force and income data to be employed in the new study indicates that they are significantly different from those used by Pandit and Casetti (1989). New estimates of agricultural labour force shares are larger, and industrial labour force share estimates are lower. In addition to these fundamental value changes, the new test is based on has fewer cases, due to a change in the number of time periods for which estimates are made.

The difference in data does not change the overall result of the original test. A significant time-modified variable is entered into the terminal model for industry, indicating an overall shift in structural transformation patterns. Test results were stronger in the original study, but a simple test of the effect of the reduced sample size demonstrates that much of the cause can be attributed to this change. It is notable, though, that the new estimates also reflect a lower level of overall structural transformation, with more agricultural labour activity and less industrial activity. This may also have an effect on the results.

The predicted data, of the new test, show a slightly more rapid move out of agriculture over time and progressively smaller industrial labour force shares at medium income levels. Tests with weighted data actually show a reduced move out of agriculture with GDP change, in contrast to unweighted data, and have overall greater significance. The greater significance is perhaps because of the increased number of 'cases', as counted by the weighting system chosen. The strong influence of India and the US also helps reduce variation, thus allowing any other variation over time to be more easily captured. It also affects the overall shift captures in the relationship between GDP growth and

labour force change between the weighted and unweighted tests. The most interesting result, in light of the overall hypothesis, is an observable acceleration in shift between 1980 and 1990. When time-periods are examined decade by decade, only the 1980 to 1990 model incorporates a significant time-modified variable.

In brief, a shift in structural transformation is measurable and is accelerating. Industrial labour force share is decreasing, relative to income, in NICs and SICs. Development and industrial restructuring schools which foresee a significant period of international specialisation in the world economy must consider the different social impact of late industrialisation more seriously. NICs and SICs will not be replicating an earlier stage of industrialisation experienced by the OICs, but undergoing a distinct social and economic change for which the OIC experience can provide little insight.

CHAPTER 5

METHODOLOGY AND DATA II: DETAILED CHANGES OVER TIME

I Introduction and Rationale for Further Analysis

Chapter one identified three factors affecting the relationship between industry and GDP per capita, for which the cross sectional study in chapter four provides supportive evidence. Higher capital-intensity in production and increased international competition are expected to produce smaller, lower-paid industrial labour forces in countries which are now industrialising, and in those which industrialised since World War II. The extension and modification of Pandit and Casetti's 1989 study confirms that industrial labour forces are indeed smaller in later time periods at similar GDP per capita levels, and further indicates that this change was more pronounced between 1980 and 1990. Underlying the study's rationale is the assumption that this reduction in industrial labour force size is associated with a reduction in personal incomes. This, in turn, affects the diffusion of modern economic production and demand to other sectors of the economy and throughout society in general. As mentioned at the outset of chapter three, labour force and GDP per capita measures, are proxy measures for the social integration of productive change.

Even with the introduction of time-modified variables, however, the cross-sectional analysis is limited in its ability to capture change. Time-series data are thus examined in more detail to counter some of these limitations. For example, while figure 4-2b indicates that labour force values peak at progressively lower levels with respect to GDP per capita, the raw data in figure 4-1b indicate that this is accompanied by

considerable variation. In fact, figure 4-1 indicates that the model tends to underestimate values in the mid-GDP per capita range and overestimate them at the highest. Because the large number of countries at low GDP per capita are fairly well predicted, the overall model is significant, and this variation is not mathematically significant. Still, variation seems to be systemic, rather than random, so the model is failing to capture important information.

Another limitation of the general cross-sectional study, is that it is an *indirect* test of changing capital-intensity levels in industry. Ideally, to test changes in capital-intensity and pay levels, employment and wage data could be examined; these are published annually in the ILO yearbooks. In particular, there are detailed data available for manufacturing sub-sectors (Appendix V). However, these are available for a smaller set of countries, and data generally go back only to 1969. So, to further explore the effect of changing capital-intensity levels for the large sample, changes in three additional new indicators are measured over time, along with the previously utilised GDP per capita and sectoral labour force share. These are: 1) sectoral GDP share, 2) the ratio of sectoral labour force share to sectoral GDP share, and 3) an indicator of overall labour force inactivity rates. The null hypothesis is that there is no change over time.

II. Data and Hypotheses

New data for these studies are drawn from the previously used ILO labour force estimates (ILO, 1995a-d), time-series collated and published by the World Bank (World Bank 1995b, 1997), and the ILO yearbooks. Sectoral GDP share data are drawn from the World Bank's data bases. Most data for 1970 to 1995 are from *World Development*

Indicators 1997, and for 1960 to 1970 from *World*Data 1995*, with supplementary data for specific countries from the OECD's[1] *Historical Statistics* (1985, 1990, 1995), and the *Statistical Yearbook of the Republic of China* (Taiwan). Additional data from 1950 to 1960 are drawn from Mitchell (1992, 1994, 1995) and the *Statistical Abstract of Latin America* (volume 20, 1980).

For an estimate of total labour force participation, the recent ILO (1995a) labour force estimate for age groups by sex was used. Activity for males at the prime age of 35-39 was selected as a general indicator, since country totals for all ages and both sexes are not estimated. The differing effects of both changing technology and of new competition on activity by sex and age is well documented, but looking for this variation becomes complex in a multi-country study. Instead, males from age 35-39 are examined on the basis that any decline for this prime age-group is a very strong indicator of the decline in earning power and social power of the total workforce. This particular choice was assumed to remove most variation due to child-bearing, shorter life spans, and post-secondary educational activities.

The ratio of sectoral labour force share to sectoral GDP share provides information about people's social integration into the most productive sectors. Ideally, the ratio value of labour force share to GDP share should be close to 1.0, indicating that labour is equally distributed according to production. Numeric values above one indicate that the sector has a large labour force relative to its contribution to national income. Labour costs must therefore be low for production to produce a profit. Numeric values below 1.0 indicate that capital contributes relatively more to production. Labour may be

---

[1] Organization for Economic Co-operation and Development.

well paid, but fewer employees benefit directly from the sector's production. Assuming that a ratio of 1.0 is ideal also assumes that labour cost and pay will balance out according to demand for products and services. This means that a situation of, for example, high demand for a labour-intensive industry should not occur with low pay to its workforce.

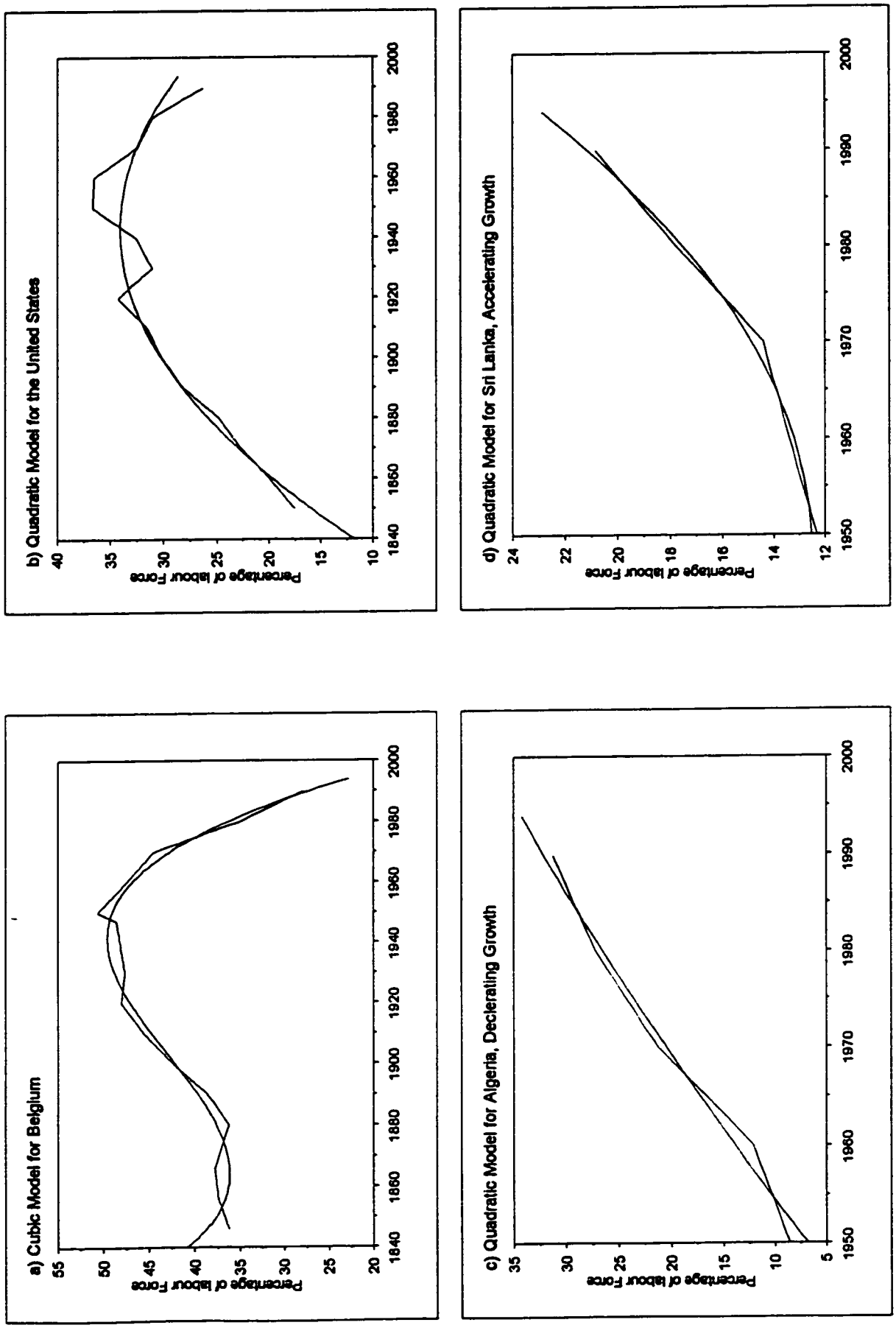
Since it is known that industrial labour forces in many NICs and SICs now grow to a lower peak, and that the industrial share of GDP is falling relative to services in OICs, a more useful question is whether the *ratio* of labour force share to GDP share also falls. A ratio which is falling below 1.0 indicates declining social importance for labour, with respect to the sector's overall importance. A ratio rising towards 1.0, on the other hand, indicates an increasing social importance for labour in a sector. If the ratio is rising above 1.0, however, the relative size of the labour force is increasing, but the social importance of labour is likely declining. Indicators and the hypothesised change over time are summarised below. Note that for agricultural change, no predictions are made about GDP change or LF:GDP ratio change. Because rural populations have remained high in absolute numbers, but have experienced relative decline, labour-intensity has remained high in some areas even while manufacturing and service sectors grow. Due to readily available technology and unequal landownership patterns, however, sometimes agricultural capital-intensity has risen at the expense of existing labour. In some cases, there are reasons why change may not be clearly linear (as for agriculture, above). Therefore three possible patterns are hypothesised, two of which represent linear change: a fall over time, a rise over time, and variation over time. The latter will not be captured by the linear test, but graphical views of the results will be presented for discussion.

Variable	Hypothesised Change
Total GDP per capita	Rises over time, due to more rapid industrialisation
Industry	
Labour force	Falls over time, as capital-intensity is greater.
Share of GDP	Rises over time, due to more rapid industrialisation.
Labour force to GDP ratio	Falls over time, with fewer people in a higher income sector.
Service	
Labour force	Rises over time, becomes the employer of last resort
Share of GDP	Falls over time, absorbs labour in low-income activity.
Labour force to GDP ratio	Rises over time, more people in a lower income sector.
Agriculture	
Labour force	Falls over time, perceived attractiveness of other sectors.
Share of GDP	Varies over time, dependent on capital-intensity
Labour force to GDP ratio	Variable over time
Labour force participation	Falls over time

Comparisons of the full time-series, as pictured in figure 1-1 (p. 16), are not made for a number of reasons. The most obvious is that comparable time-series extending from the beginning of agricultural decline to manufacturing decline are not available for many countries. Second, while the modelling of individual countries and comparison of model parameters is possible and potentially interesting (Eckhaus, 1978), it is a more complex method than is required to measure the change hypothesised. Furthermore, the same model cannot be applied to all countries. As can be seen in figure 5-1a, Belgian data fit a cubic model well, while the US data better fit a parabolic model. Even when all countries are forced to fit a parabolic model, the sign of the parameters can vary between countries, as for Sri Lanka and Algeria (figure 5-1b). This renders comparisons, at best, complex. Comparing the different models and their signs might indeed prove interesting, as Eckhaus (1978) suggests, but is a more complex analysis than is needed for the hypotheses.

Instead, several benchmark values for agricultural and industrial labour force levels are identified. Each indicator is then regressed over time, with time being captured

Figure 5-1 Attempts to Fit Curvilinear Models to Industrial Labour Force Time-Series



by the year the benchmark value was reached for each country. In other words, cross-sections of specific time-series are examined at similar stages. Figure 5-2a graphs industrial labour force time-series for five sample countries, while figure 5-2b graphs the model benchmark, the maximum values[2] (points A to F) against their corresponding x-values. Simple regression analysis is then used to test the null hypothesis of no change over time.

III. Identification of Benchmark Values and Industrial Groupings

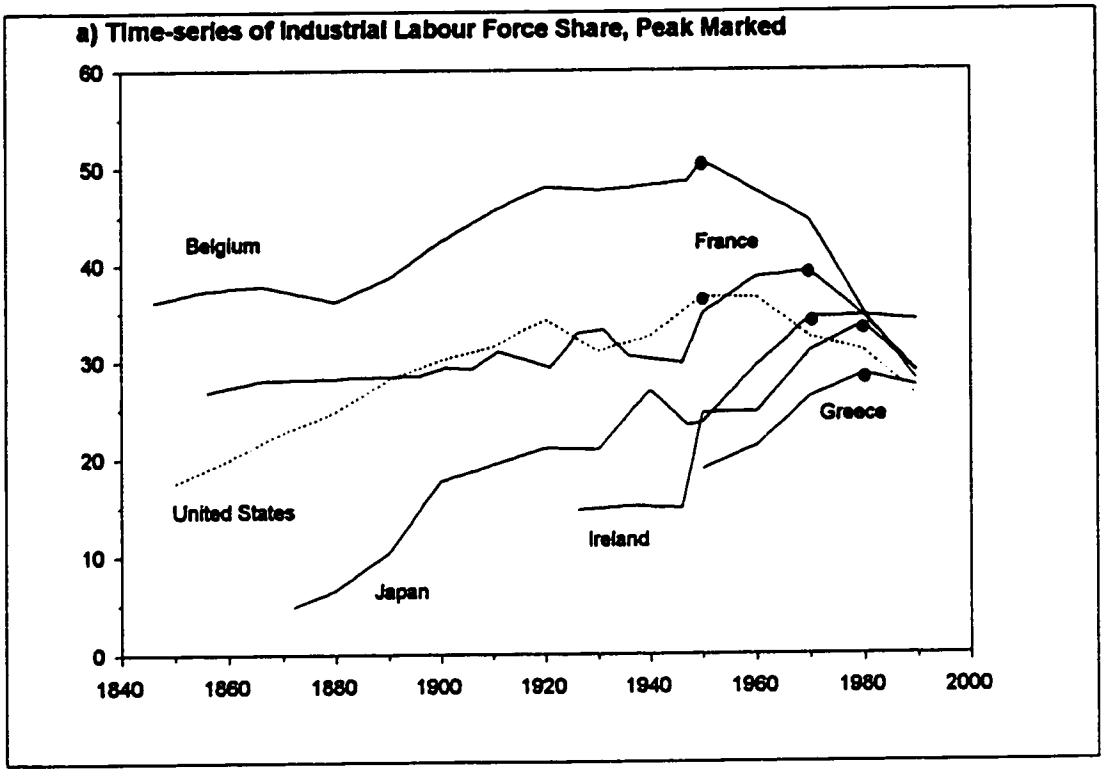
A. Identifying Labour Force Benchmarks

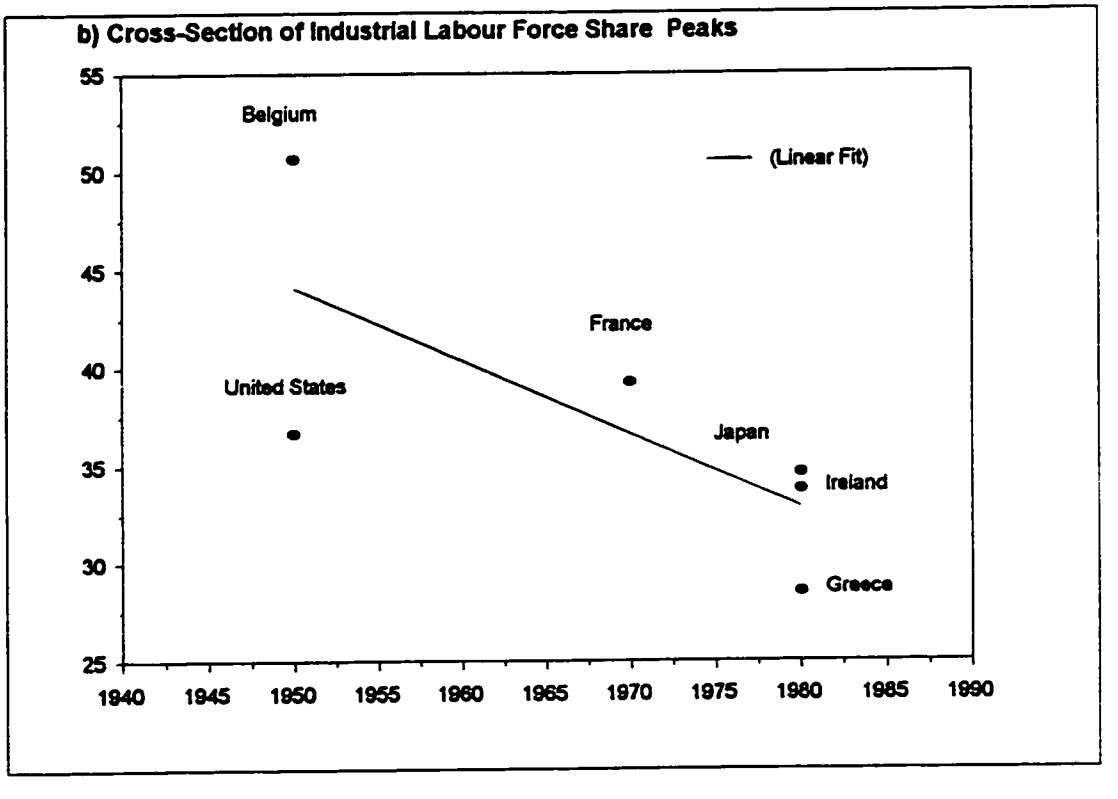
Since this second study focuses on more industrialised countries, countries are classified by their industrial status for comparisons. The quantitative criteria for classifications are then used as benchmarks for the regression analyses. Previous attempts at classifying countries by level of industrialisation have often considered sectoral contributions to GDP and trade, manufacturing growth, and consumption levels, the latter being approximated with income data (ex: Chenery and Syrquin, 1986; Ingalls and Martin, 1988). However these data are not always readily available, and thus provide poorer world coverage than the ILO's estimate of labour force activity for 175 countries and territories. For example, in the sample estimates for labour force, GDP per capita, and growth in table 3-1 (p. 70), only 113 countries have data for all seven variables. Labour force activity is chosen as the primary defining variable to allow the classification

---

2 Maximum *industrial* labour force is not actually used as a benchmark, but simply illustrates the method.

Figure 5-2 Sample Cross Section of Industrial Labour Force Share Time-Series





of all 175 countries[3]. Two secondary measures are also used, in order to identify rapidly industrialising countries: the percentage of manufacturing labour in the total industrial labour force and the growth of manufacturing employment.

While all countries with available labour force data were included for grouping, few ultimately had all indicators for the final analysis. Pandit and Casetti's (1989) criteria for limiting the sample selection, such as population sizes under two million, having centrally-planned economic systems, having predominantly urban land-use, and being dominated by oil-extraction, are not relevant here for a number of reasons. For one thing, there are conceptual inconsistencies in eliminating any country in an analysis of what is increasingly described as a global economy. While some small countries have higher than average trade activity, thus affecting labour force and GDP structures, they may also have considerable influence on international development policy. So they are re-introduced. Predominantly urban countries like Hong Kong and Singapore, are also reintroduced. While it makes sense to exclude states with a predominantly urban land mass from an analysis of agrarian to industrial transformation, this study also considers changes to the industrial sector. Industrial changes world wide certainly were related to recent industrial activity in Singapore and Hong Kong.

Eliminating the oil-exporting economies is also problematic. Resource-based development has come under criticism (ex: Auty, 1995), but countries like Canada did successfully industrialise through resource extraction and other primary activity, even spawning it's own staples theory of development (Innis, 1930; Watkins, 1962;

---

[3] Taiwan is added to the ILO base of 175 and East Timor is removed, since World Bank data are unavailable. Taiwanese data are drawn from the Statistical Yearbooks published by the Republic of China, and are employment rather than labour force data.

Brookfield, 1975). This experience may have been duplicated only rarely, yet early industrialisation efforts were influenced by them. Eliminating them seems to create a country selection biased towards a pre-formed conclusion, namely that only manufacturing-based industrial activity leads to general economic growth. Furthermore, resource-based activity in the oil-producing countries greatly influenced other industrialisation in the 1970s and 1980s.

Perhaps most problematic is the re-introduction of the ex-Soviet republics and East Bloc countries. Their industrialisation was without the stimulus of freer supply and demand, and their employment and participation rates were also defined differently. They are re-introduced in the grouping largely because their rapid industrialisation greatly affected the pace of industrial activity in the both the OICs and other countries. As noted in chapter 2, thwarting Soviet expansion was a motive behind early development planning, and some have argued it cannot be separated from the rapid industrialisation of the East Asian countries (ex: Cline, 1982). Likewise, the USSR influenced industrialisation efforts in the more mixed economies of several LICs. Lastly, the cold war arms race and political competition were, themselves, driving forces behind much industrial activity and innovation in both the United States and the USSR. Whole industrial regions were created, with positive and negative spin-off effects (ex: Markusen, 1986, for the United States). Therefore, it is misleading to analyse world-wide industrial change without the centrally-planned economies of the former 'second world'. Their presence, if not their method, influenced rates of structural transformation.

However, it should be noted that the inclusion of new countries, especially the increase in number of new states since the break-up of Yugoslavia, the USSR and

Czechoslovakia, potentially alters the analysis. By examining both weighted[4] and unweighted data, these effects are addressed.

Ultimately, six benchmarks based on industrial versus agricultural labour force structure were identified, to which one further benchmark, the year of manufacturing employment peak, was added. The seventh benchmark is discussed more fully in section IV. Three of the seven benchmarks are used in the cross-sectional comparisons, while the general country groupings, identified through the benchmarks, provide an interesting basis for comparing rates of structural transformation.

Benchmark values are identified through two methods. First, the labour force structure of those countries identified as 'industrialised' by Chenery and Syrquin (1986) is examined. Chenery and Syrquin identified 15 countries as industrial by 1950 and an additional six by 1960 (table 5-1). An examination of labour force values indicates that an agricultural labour force share of under 35%, and an industrial labour force share of over 30%, are associated with 'industrialised' status, at least in the market-based economies. These values are therefore used as the defining criteria for *newly industrialised countries* (NICs).

To identify countries in a more transitional phase between 'agrarian' and 'industrial', the distribution of agricultural and industrial labour force values were examined for the entire ILO (1995a) data set for 1950 (figure 5-3). Additional breaks

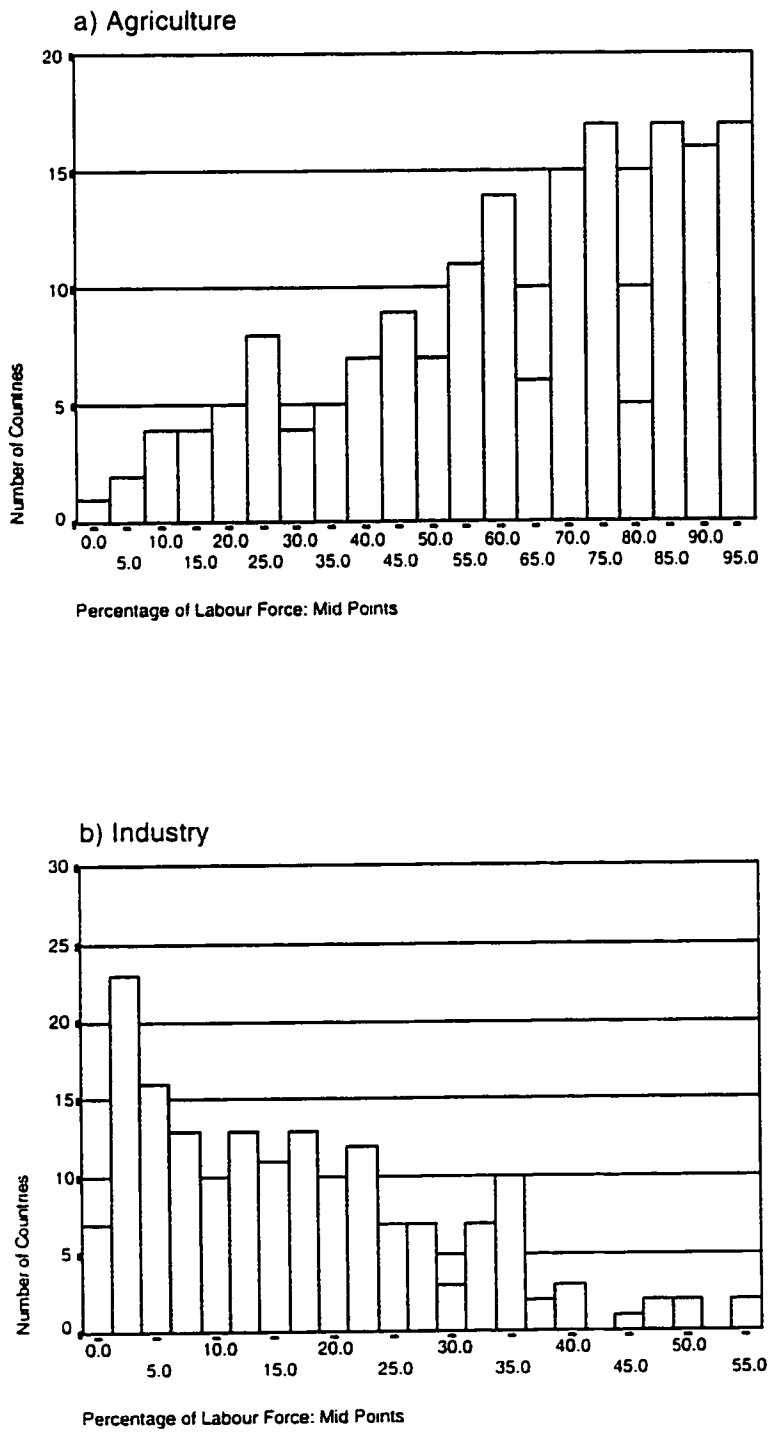
---

4 Population weights are for the year of the benchmark, so that, for example, Mexico's population at Agriculture = 60% is a percentage of the 1950 estimate of the world's population. Population data were gathered from three sources. For 1960 to 1990, the World Bank (1995) estimates published in *World*Data* could be used. For historical data before 1950, Angus Maddison's (1995) *Monitoring the World Economy 1820-1992* provides estimates for the OICs as well as Chile and Argentina. For 1950 to 1959, the Penn World Tables Data were used where they were available. Where these data were absent, a combination of linear projections from the World Bank estimates, or from Maddison's estimates for 1950 were used.

Table 5-1 Labour Force Values in Industrial Countries Identified by Chenery and Syrquin (1986)

Country	Year classified as industrial	% of Labour force in Agriculture, 1950	% of Labour Force in Industry, 1950	% of Labour Force in Agriculture, 1960	% of Labour Force in Industry, 1960
Australia	1950	15.40	39.72	11.32	39.91
Austria		34.22	36.14	23.83	46.28
Belgium		11.85	50.66	7.96	47.52
Canada		19.84	36.02	13.19	34.54
Denmark		25.70	33.59	17.93	36.96
Finland		35.01	35.17	27.42	35.47
France		30.89	34.90	22.10	38.70
Germany		23.04	43.97	15.01	47.72
Netherlands		17.68	36.23	10.76	42.47
New Zealand		18.80	34.63	14.77	36.61
Norway		26.35	36.68	19.83	36.67
Sweden		20.79	40.85	14.10	45.25
Switzerland		16.89	46.46	11.29	50.19
United Kingdom		5.48	49.49	4.01	47.73
United States		12.30	36.68	6.64	36.57
---	---	---	---	---	---
Czech Republic	1960	39.06	35.79	25.60	46.17
East Germany					
Italy		43.97	31.03	30.80	39.38
Japan		48.83	23.63	33.06	29.48
Russian Fed.		39.55	31.82	30.43	35.55
Slovakia		39.24	35.64	25.66	46.05

Figure 5-3 Distribution of Labour Force Share Values, 1950



were identified at about 60% and 20% for agriculture, and 10% and 20% for industry.

Country groupings are thus defined as follows:

Group	Code	Defining Labour Force Share Criteria
Older Industrialised Countries	OIC	Agriculture <= 35%; industry >= 30% by 1950, identified by Chenery and Syrquin (1986)
Other Older Industrialised Countries	NIC0	Agriculture <= 35%; Industry >= 30% by 1950, not identified or not used by Chenery and Syrquin's (1986)
Newly Industrialised Countries	NIC1	Agriculture <= 35%; Industry >= 30% by 1960
Newly Industrialised Countries	NIC2	Agriculture <= 35%; Industry >= 30% by 1970
Newly Industrialised Countries	NIC3	Agriculture <= 35%; Industry >= 30% by 1980
Newly Industrialised Countries	NIC4	Agriculture <= 35%; Industry >= 30% by 1990
Semi-Industrialised Countries	SIC1	Agriculture <= 35%; Industry 10% to 30%
Semi-Industrialised Countries II	SIC2	Agriculture = 35% to 60%; Industry 10% to 30%
Rapidly Industrialising Countries	RIC	Agriculture > 60%, Industrial labour and GDP growth above average of all countries
Less Industrialised Countries	LIC	Agriculture > 60%; Industry < 20%

Since the ILO estimate gives values only for the beginning of each decade, the decade year with the closest value was used where countries crossed a benchmark between two decades. For the regression analyses, a more exact year was desired, and linear interpolations of the decade-by-decade data were used. There are some exceptional classifications, where benchmark values become too constraining. Greece, which was defined as an NIC by 1980, has a maximum industrial labour force below 30%, but which is now declining. Brazil, on the other hand, has a maximum industrial labour force value of 23% in 1980, but is classified as an SIC. Its agricultural labour force is still large, and industrial decline may have been greatly influenced by the debt crisis of the eighties. Similarly, Iran has an industrial peak in 1970, but it is also well below 30%, and its turbulent political history affected social structure and economic activity. Its large agricultural labour force share places it in the SIC2 category. In both of the latter cases, it is unclear if the industrial labour force will increase again, since increases in international

competition and increasing capital-intensity have lowered several OIC labour force shares to below 25%.

Significant changes in indicator values were found for countries which crossed the benchmarks of agriculture labour force share = 60% (AG=60%) and industrial labour force share = 20% (IND=20%). Because few GDP share data are available for the former centrally-planned economies, they had to be removed from the sample, leaving the countries listed in table 5-2. Historical data were examined to see if OICs could be included in the sample, but too few cases were introduced, and patterns were very variable. Historical data are more numerous and more useful for the manufacturing employment peak benchmark.

B. Discussion of Groupings

Table 5-3 summarises groupings and lists the values for sectoral labour force, GDP per capita, change in manufacturing labour force, change in the manufacturing sector's contribution to GDP, and 1990 population. The fifteen OICs all currently have declining industrial and manufacturing labour force share, and have, by far, the highest GDP per capita. Only Japan and Italy, in the NIC1 group, attain GDP per capita values comparable to the first OICs. Smaller Luxembourg and Iceland (NIC0) also have very high GDP per capita. As of 1998, Luxembourg had the highest GDP per capita according to its national measures and the purchasing power parity estimates (World Bank, 1998a).

Thirteen other countries meet the IND=30% and AG=35% values in 1950, but are not included in Chenery and Syrquin's 1986 list. Of these, the Czech Republic and Slovakia (as Czechoslovakia) were considered industrialised by 1960 by Chenery and Syrquin (1975), but were excluded from their 1989 study as having centrally-planned

Table 5-2 Country Sample for AG=60% and IND=20%

Agricultural Labour Force = 60%					Industrial Labour Force = 20%				
NAME	CODE	TYPE	YEAR	% World Pop.	NAME	CODE	TYPE	YEAR	% World Pop.
Algeria	DZA	NIC4	1963	.4281	Algeria	DZA	NIC4	1969	.3690
Botswana	BWA	SIC2	1982	.0211	Botswana	BWA	SIC2	1990	.0243
Brazil	BRA	SIC	1950	2.7446	Brazil	BRA	SIC	1964	2.5042
Congo	COG	SIC2	1977	.0363	Costa Rica	CRI	SIC	1968	.0459
Cote d'Ivoire	CIV	SIC2	1989	.2232	Dominican R.	DOM	SIC	1976	.1246
Dominican R.	DOM	SIC	1962	.1264	Ecuador	ECU	SIC	1966	.1556
El Salvador	SLV	SIC2	1963	.0882	Egypt	EGY	SIC2	1987	1.0046
Ghana	GHA	SIC2	1970	.2329	El Salvador	SLV	SIC2	1981	.1012
Honduras	HND	SIC2	1976	.0752	Greece	GRC	NIC3	1953	.3303
Indonesia	IDN	SIC2	1977	3.3537	Honduras	HND	SIC2	1990	.0928
Korea, South	KOR	NIC3	1961	.8559	Korea, South	KOR	NIC3	1970	.8559
Malaysia	MYS	SIC	1963	.3204	Malaysia	MYS	SIC	1982	.3151
Mauritania	MRT	SIC2	1987	.0372	Mexico	MEX	NIC3	1961	1.2348
Mexico	MEX	NIC3	1950	1.5209	Morocco	MAR	SIC2	1978	.4314
Morocco	MAR	SIC2	1967	.4054	Nicaragua	NIC	SIC	1973	.0579
Nicaragua	NIC	SIC	1961	.0661	Paraguay	PRY	SIC2	1971	.0639
Pakistan	PAK	SIC2	1962	1.6816	Peru	PER	SIC2	1958	.3405
Philippines	PHL	SIC2	1966	.9711	Sri Lanka	LKA	SIC2	1986	.3326
Swaziland	SWZ	SIC2	1973	.0116	Swaziland	SWZ	SIC2	1982	.0131
Turkey	TUR	SIC2	1980	1.0004	Syrian Arab R.	SYR	NIC4	1963	.1564
					Tunisia	TUN	NIC3	1962	.13

Sources: Groupings are from Table 5-3 (p. 120); population data per footnote #4, (p. 114).

Table 5-3 Countries by Type

Country	% Labour Force in Agriculture	% Labour Force in Industry	% Labour Force in Services	GDP per capita	% Mfg in Industrial Labour Force	Change in Mfg contribution to GDP, 1980-1990	Population in 1990 x 1000
OIC: Older Industrial Countries, Labour force values for 1950							
Australia	15.40	39.72	44.89	6678	61.13	2.38	17065
Austria	34.22	36.14	29.65	2930	73.14	1.48	7725
Belgium	11.85	50.66	37.48	4433	74.07	.68	9967
Canada	19.84	36.02	44.14	6380	64.30	.38	27791
Denmark	25.70	33.59	40.72	5263	71.34	.41	5140
Finland	35.01	35.17	29.82	3506	60.35	1.27	4986
France	30.89	34.90	34.20	4045	71.00	-.04	56735
Germany	23.04	43.97	33.00	3421	80.28	.	79433
Netherlands	17.68	36.23	46.10	4532	71.80	1.06	14952
New Zealand	18.80	34.63	46.57	6667	70.34	1.99	3362
Norway	26.35	36.68	36.97	4358	57.21	-.24	4241
Sweden	20.79	40.85	38.40	5807	76.51	.91	8559
Switzerland	16.89	46.46	36.65	6813	78.60	.	6712
United King.	5.48	49.49	45.03	5395	69.57	.	57561
United States	12.30	36.68	51.03	8772	67.68	.69	250372
NIC0: Other Industrialised Countries, Labour Force values for 1950							
Argentina	25.07	31.80	43.13	4032	60.56	3.55	32527
Bahrain	16.59	46.51	36.89	.	37.18	5.38	503
Chile	33.14	30.03	36.83	2431	63.45	5.52	13173
Czech R.	39.06	35.79	25.15	.	75.36	.	10363
Hong Kong	12.12	55.68	32.20	.	75.56	.	5705
Iceland	36.52	31.79	31.69	3808	69.82	-.89	255
Israel	18.47	33.23	48.30	.	55.93	.	4645
Kuwait	1.94	34.01	64.05	.	29.82	.	2125
Luxembourg	24.03	40.40	35.57	6534	81.50	.22	382
Malta	12.76	31.44	55.80	.	80.45	.	354
Neth. Antilles	3.14	55.37	41.49	.	46.87	.	190
Slovakia	39.24	35.64	25.12	.	84.09	.	5283
Trinidad & Tob	24.68	33.34	41.98	3046	32.98	.	1236
NIC1: Newly Industrialised Countries, Labour Force Values for 1960							
Barbados	26.38	27.23	46.39	2666	51.84	-1.74	257
Brunei	34.21	34.97	30.83	.	23.69	-2.89	257
Estonia	28.35	36.28	35.37	.	66.32	.	1571
Hungary	38.02	34.94	27.03	.	76.78	.	10365
Italy	30.80	39.38	29.83	4564	69.98	.80	56719
Japan	33.06	29.48	37.46	2954	70.27	.90	123537
Latvia	34.74	32.86	32.40	.	72.76	-15.68	2671
Puerto Rico	25.41	29.29	45.30	3102	65.34	.61	3530
Russian F.	30.43	35.55	34.02	.	61.66	.	148292
United Arab Em.	28.79	29.32	41.89	.	27.78	2.44	1844

Country	% Labour Force in Agriculture	% Labour Force in Industry	% Labour Force in Services	GDP per capita	% Mfg in Industrial Labour Force	Change in Mfg contribution to GDP, 1980-1990	Population in 1990 x 1000
NIC2 Newly Industrialised Countries, Labour Force Values for 1970							
Armenia	27.14	37.85	35.02	.	76.73	.	3545
Belarus	34.69	33.53	31.77	.	69.89	.	10260
Bulgaria	34.76	37.75	27.49	.	80.38	.	8718
Cyprus	38.44	27.86	33.70	3753	66.42	.74	681
Ireland	26.36	30.99	42.65	5015	68.95	.	3506
Kazakhstan	26.86	30.26	42.88	.	48.45	.	16742
Kyggyzstan	35.59	29.58	34.83	.	55.41	.	4395
Lithuania	31.42	36.95	31.63	.	68.51	.	3722
Poland	38.91	34.23	26.86	2941	67.75	.	38119
Portugal	31.75	31.76	36.49	3306	71.80	.	9896
Singapore	3.43	30.25	66.31	3017	79.66	8.44	2705
Slovenia	49.80	29.17	21.04	.	84.75	.	1998
South Africa	30.97	29.77	39.26	3254	49.16	-.58	37066
Spain	26.00	37.56	36.44	5861	66.12	.47	38836
Taiwan	36.70	27.90	29.90	2188	71.91	.	.
Ukraine	30.80	36.59	32.61	.	70.34	-15.85	51891
Uruguay	18.68	29.06	52.26	4121	73.50	-1.37	3094
NIC3 Newly Industrialised Countries, Labour Force values for 1980							
Bosnia Herzogov.. 4450	29.50	37.86	32.64	.	27.47	.	
Cape Verde	36.68	30.74	32.58	934	18.83	.	341
Croatia	25.01	33.92	41.07	.	78.25	.	4778
Greece	31.22	28.52	40.25	5901	70.53	-1.33	10161
Korea, South	37.12	26.53	36.35	3093	76.39	8.30	42869
Macedonia	36.04	32.64	31.32	.	73.56	.	2028
Mauritius	27.15	27.61	45.24	3988	74.43	5.62	1057
Mexico	36.32	29.09	34.60	6054	66.84	1.42	83488
Qatar	2.81	28.07	69.12	33946	21.60	.	486
Romania	34.81	40.67	24.52	1422	77.84	.	23207
Tunisia	38.89	30.27	30.84	2527	50.35	.70	8162
NIC4 Newly Industrialised Countries, Labour Force values for 1990							
Algeria	26.13	31.28	42.59	2777	35.93	-11.15	25010
Cuba	18.15	30.36	51.49	.	65.74	.	10625
Georgia	26.03	31.43	42.54	.	65.42	-27.41	5460
Lebanon	7.29	30.98	61.74	.	50.13	.	3635
Maldives	32.31	31.01	36.68	.	87.07	.	216
Maldive	32.99	29.90	37.11	.	63.71	.	4364
Syrian Arab R.	33.20	23.95	42.85	3897	55.03	.	12116
Yugoslavia, F.	29.70	33.09	37.21	4548	75.52	.	10431

Country	% Labour Force in Agriculture	% Labour Force in Industry	% Labour Force in Services	GDP per capita	% Mfg in Industrial Labour Force	Change in Mfg contribution to GDP, 1980-1990	Population in 1990 x 1000
SIC Semi-Industrialised Countries, Labour Force values for 1990							
Azerbaijan	31.01	28.74	40.26	.	47.67	-2.75	7159
Bahamas	5.24	15.47	79.29	.	26.31	.	256
Belize	33.57	18.73	47.70	3464	52.59	4.64	189
Brazil	23.34	23.01	53.65	4042	49.63	-.85	148002
Colombia	26.62	22.94	50.45	3300	73.63	2.75	33634
Costa Rica	26.03	26.77	47.20	3499	73.33	4.65	3035
Dominican R.	24.83	29.13	46.04	2166	67.04	1.57	7110
Ecuador	32.26	19.11	47.63	2755	61.22	2.76	10264
Guadeloupe	6.63	19.58	73.80	.	41.57	.	391
Guyana	21.84	24.71	53.45	.	61.35	1.62	798
Iraq	16.10	17.50	66.39	.	38.17	.	18078
Jamaica	24.76	23.29	51.95	2545	68.23	-.81	2404
Jordan	15.27	23.46	61.28	2919	31.42	6.40	3170
Libya	10.89	22.95	66.16	.	20.78	.	4545
Malaysia	27.34	23.14	49.52	5124	71.05	13.73	17891
Martinique	7.49	17.05	75.46	.	52.02	.	360
Mongolia	32.00	22.54	45.46	1842	75.38	.	2216
Nicaragua	27.71	26.28	46.02	1294	75.30	-.29	3750
Panama	26.18	16.06	57.77	2888	65.01	.	2418
Reunion	6.77	18.27	74.96	.	38.81	.	601
Saudi Arabia	19.22	19.76	61.01	.	33.76	.87	15803
Surinam	21.27	17.76	60.97	.	36.32	-.91	405
Uzbekistan	34.94	25.09	39.97	.	49.06	-2.41	20515
Venezuela	12.02	27.31	60.67	6055	59.83	3.50	19325

Country	% Labour Force in Agriculture	% Labour Force in Industry	% Labour Force in Services	GDP per capita	% Mfg in Industrial Labour Force	Change in Mfg contribution to GDP, 1980-1990	Population in 1990 x 1000
SIC2 More Agrarian Semi-Industrialised Countries, Labour Force values for 1990							
Albania	54.58	23.16	22.25	.	79.49	.	3282
Bolivia	46.84	17.52	35.64	1658	54.34	.	6573
Botswana	46.36	20.40	33.24	.	25.25	3.04	1277
Congo	48.72	14.66	36.32	2211	48.91	-2.28	2276
Cote d'Ivoire	59.94	9.57	30.49	1213	71.79	-2.22	11974
Egypt, Arab Rep	40.28	21.51	38.21	1912	63.74	.13	52426
El Salvador	36.32	20.70	42.98	1824	71.64	.	5031
Fiji	45.64	14.95	39.31	4007	56.19	3.93	732
Gabon	51.54	15.91	32.55	3958	60.28	-.49	935
Ghana	59.30	12.97	27.73	902	78.49	2.96	14870
Guatemala	52.41	17.46	30.13	2127	76.23	.	9197
Honduras	41.40	19.62	38.98	1377	73.39	2.53	5105
Indonesia	55.18	13.61	31.22	1974	76.49	11.28	178232
Iran	38.76	22.53	38.71	3392	52.91	7.66	55779
Korea, DPR	38.10	31.37	30.54	.	73.10	.	21771
Lesotho	40.07	27.85	32.08	972	7.68	6.62	1783
Mauritania	55.20	10.40	34.40	791	60.58	1.12	2003
Morocco	44.67	24.81	30.52	2151	66.22	3.89	24043
Namibia	49.08	15.39	35.53	5838	36.65	7.42	1352
Oman	44.51	23.84	31.65	.	38.26	4.89	1627
Pakistan	51.80	18.53	29.67	1394	64.65	5.61	112351
Paraguay	39.02	22.04	38.94	2128	60.12	1.25	4219
Peru	35.66	17.85	46.49	2188	64.65	.	21512
Philippines	45.76	15.34	38.90	1763	66.62	2.17	61480
Sri Lanka	48.49	20.89	30.62	2096	67.45	8.97	16993
Swaziland	39.48	23.32	38.20	.	46.66	-9.85	794
Tajikistan	40.68	23.41	35.92	.	48.23	.	5303
Turkey	53.07	18.29	28.63	3741	66.32	6.04	56098
Turkmenistan	37.23	22.83	39.94	.	35.13	.	3668
RIC Rapidly Industrialising Countries, Labour Force Values for 1990							
Bangladesh	65.24	16.41	18.34	1390	89.95	7.09	110368
China	72.24	15.10	12.66	.	74.30	14.20	1135160
India	64.02	16.02	19.97	1264	82.27	5.56	849515
Thailand	64.06	13.99	21.95	3580	72.48	12.36	55580

Country	% Labour Force in Agriculture	% Labour Force in Industry	% Labour Force in Services	GDP per capita	% Mfg in Industrial Labour Force	Change in Mfg contribution to GDP, 1980-1990	Population in 1990 x 1000
LIC Less Industrial Countries, Labour Force Values for 1990							
Afghanistan	70.33	10.65	19.02	.	75.49	.	20445
Angola	74.53	8.06	17.41	.	52.61	-11.27	9229
Benin	63.50	8.14	28.36	920	64.86	4.79	4737
Bhutan	94.12	.91	4.98	.	87.91	10.55	600
Burkina Faso	92.38	1.81	5.80	511	76.24	132.66	9016
Burundi	91.65	2.71	5.64	550	66.05	-3.43	5487
Cambodia	73.87	7.50	18.64	.	83.87	5.09	8695
Cameroon	69.71	8.84	21.45	1226	69.91	-2.04	11484
Central Af R.	80.20	3.50	16.30	579	47.71	.	2929
Chad	83.22	4.20	12.58	399	48.33	-3.29	5680
Comoros	77.36	9.31	13.33	564	53.60	3.87	433
Equatorial Gui.	74.79	5.30	19.91	.	38.68	9.90	352
Eritrea	80.47	4.98	14.55	.	88.15	.	3139
Ethiopia	86.18	2.09	11.73	.	79.90	2.77	51180
Gambia, The	81.89	7.60	10.51	799	92.11	.59	923
Guinea	87.18	1.88	10.94	767	31.91	.	5755
Guinea-Bissau	85.34	1.85	12.81	689	58.92	.12	965
Haiti	67.80	8.78	23.42	.	74.72	.	6473
Kenya	79.52	7.26	13.22	911	62.95	2.97	23354
Laos	78.14	6.28	15.58	1385	70.38	.	4201
Liberia	72.25	5.57	22.18	.	28.73	.	2435
Madagascar	78.19	6.75	15.06	675	68.89	2.66	11672
Malawi	86.64	4.92	8.44	519	60.57	2.71	8507
Mali	85.80	1.97	12.23	531	82.23	4.61	8460
Mozambique	82.73	8.02	9.25	760	89.28	.	14182
Myanmar	73.27	9.83	16.90	.	75.08	4.27	41354
Nepal	93.59	.25	6.17	.	72.00	13.33	18916
Niger	89.91	3.94	6.15	.	91.88	.	7666
Nigeria	43.01	6.91	50.08	995	55.28	1.62	96203
Papua New Gui.	79.19	6.52	14.29	1425	56.90	1.51	3839
Rwanda	91.71	3.39	4.90	756	48.08	-12.27	6954
Senegal	76.72	7.51	15.77	1145	92.41	.56	7404
Sierra Leone	67.44	15.31	17.25	901	28.54	-1.61	3997
Solomon Islands	76.52	7.12	16.36	.	49.72	.	320
Somalia	75.32	8.24	16.44	.	88.23	.	8623
Sudan	69.47	8.45	22.08	757	58.70	1.91	24061
Tanzania	84.40	4.90	10.70	.	76.53	3.55	25483
Togo	65.56	10.07	24.37	641	65.54	4.90	3524
Uganda	84.53	4.73	10.74	554	51.80	11.41	16330
Viet Nam	71.30	14.01	14.70	.	84.58	.	66233
Yemen, Republic	60.95	16.83	22.22	.	56.68	.	11876
Zaire	67.79	13.40	18.81	.	61.72	.	37405
Zambia	74.60	8.48	16.92	689	40.57	1.38	7784
Zimbabwe	68.17	8.29	23.54	1182	67.55	.	9747

Data Sources: ILO (1995a); Penn World Tables, Mark 5.6 (1992); World Bank (1997b).

economies. Iceland and Luxembourg were excluded from previous analyses on the basis of size. Argentina's and Chile's presence are worth noting, because their history as fairly old, industrialised countries is often overlooked, presumably on the basis of GDP per capita and GDP growth rates. The remaining countries tend to comprise smaller, more geographically urban countries with the exception of the oil-refining Trinidad and Tobago.

By 1960, the presence of Russia and some former Soviet republics is apparent in world-wide industrialisation. Italy and Japan, the last of Chenery and Syrquin's (1975, 1986) older industrial countries, also appear. By 1970, the majority of emerging NICs are Soviet or East Bloc countries. In some of these, a collapse of industrial activity is notable between 1980 and 1990 in ILO and World Bank data. Three later western European industrialisers, Ireland, Portugal, and Spain, also appear, along with two more of the four Asian 'tigers'. The pattern of industrial development in these countries is of particular interest, as they are now considered post-industrial (IMF, 1997), have relatively shorter industrial histories, and fairly good data sets. South Africa is the first African country to be identified as industrial by 1970, though it has a fairly small manufacturing labour force within its industrial labour force, as do Kyrgyzstan and Kazakhstan. Mineral and oil-based industrial activity dominate in these three industrial countries.

The last of the 'tigers', Korea, appears by 1980, and it is also here that several countries show maximum industrial labour force shares of under 30%. Greece and Mexico never do reach 30% with the simple interpolation method used here. Romania, on the other hand shows a large industrial labour force, but virtual collapse by 1990.

Unlike the countries identified as industrial before 1990, none of the NIC4 group

are commonly identified as industrial, though Chenery and Syrquin (1986) consider them semi-industrial. Lebanon, Syria, and Algeria have higher than average service shares and relatively low manufacturing levels within industry. Moldova is one of what are now called transitional economies, while Yugoslavia and Cuba are generally perceived as politically and economically volatile. Only tiny Maldives shows both high manufacturing activity and a large industrial labour force.

The two SIC groups, both the more and the less agricultural, are even more eclectic. Rapid manufacturing growth can be identified in some countries, for example in the SICs of Malaysia and Jordan, and in SIC2s such as Indonesia and Sri Lanka. Manufacturing decline, on the other hand, is seen in Congo, Cote d'Ivoire, and Swaziland, and several former Soviet republics in central Asia. The high manufacturing growth rates in the SIC2 and RIC groups must, of course, be balanced by the knowledge that this is growth from a very small base.

Last, but not least, the LICs have the smallest industrial labour forces and are still highly agricultural. While not in the regression analyses, it is the LICs whose future policies are the most radically affected by the changing the role of industry in development.

IV. Manufacturing Employment Peak as a Benchmark

The year of peak manufacturing employment (MF PEAK) is a particularly valuable indicator. It compares the OICs with those NICs which are seen as successful industrialisers, and which are now becoming service-based economies. If a declining importance for labour can be seen here, it is clearly not reasonable to expect that the SICs

and LICs will benefit from industrialisation as the OICs did. Manufacturing employment is chosen over industrial labour force activity to identify the peak year, because data are annual rather than by decade, and because manufacturing is the largest and most dynamic sub-sector within industry. In fact, industry is actually used as a proxy for manufacturing throughout the study, since manufacturing labour force data are not estimated for before 1980 in the ILO's 1995 study.

Because countries whose manufacturing labour forces have peaked tend to be amongst the wealthier and more politically stable, better data and longer time-series are available. This allows the incorporation of pre-1950 data estimates, and the comparison of differences in rates of change between two specific benchmarks, 1) the year industrial labour force share reaches 30% (IND=30%), and 2) the year manufacturing employment peaks (MF PEAK). Therefore, this benchmark is used to make actual comparisons in changes over time between countries. Although IND=30% is also a benchmark value, it is actually chosen as the base year because it allows the greatest number of countries in the sample. As was noted in the previous section, the industrial labour force shares of several countries do not reach 30%, and they must be excluded from the analysis of change between the two benchmarks.

Manufacturing employment peaks were identified through examining up to six different data sets. The main data source is the ILO's annual statistical yearbooks, which record manufacturing employment with either an employment total, or a non-agricultural employment total for comparison. Although there are variations over time in the type of survey used, and variations in the proportion of the labour force covered (see Appendix IV for full details), the overall manufacturing *trend* was what was being sought. The

second major source, was OECD historical data published in various years (OECD, 1983, 1984, 1995). Data are especially sketchy before 1950 in the ILO Yearbooks, and absent before 1960 for the OECD historical series. Unfortunately, these are the critical years for most OICs. Aside from these sources, the ILO labour force estimate (1995a) and historical data (Mitchell, 1992, 1994,1995) were also used to confirm general trends. In some cases, historical series were available, for example the United States, and Canada (US Bureau of Labor Statistics, 1997; Statistics Canada, 1983), and national statistical yearbooks also occasionally publish partial historical time-series (Denmark, 1996, Switzerland, 1980). Lastly, the United Nations Industrial Development Organisation (UNIDO) takes an annual survey of manufacturing establishments of five or more employees to estimated manufacturing employment. Data from 1965 to 1993 are included in the World Bank's *World*Data 1995* and provide a secondary source for confirming more recent manufacturing peaks[5]. Wherever possible, an exact year was identified as the peak, though occasionally one had to be interpolated. All benchmarks and indicator values are in Appendix VI while the details of for data sources and estimation are in Appendix IV.

Because most countries in this group cross two benchmarks, new hypotheses can be tested, in addition to those listed earlier. For each indicator, change is measures in two ways: 1) differences in the indicator's values at the manufacturing employment peak, and 2) differences in the direction and magnitude of change between IND=30% and MF PEAK. The number of years that the industrial labour force is above 30% is also tested,

---

5 The UNIDO data are expressed in *World*Data 1995* as an index of 1987 values. By calculating a similar labour force index for each country, the trend of the ratio of manufacturing employment to labour force size can be calculated by dividing the former index by the latter.

as an indication of the duration of 'industrial society'.

Variable	Hypothesised Change
GDP per capita	
Value at peak	Varies over time
Magnitude of change from IND=30%	Varies over time
Industry	
# Years above 30%	Falls over time
Labour Force share at peak	Falls over time
GDP value at peak	Rises over time
Magnitude of change from IND=30%	Varies over time
Labour Force to GDP ratio at Peak	Falls over time
Magnitude of change from IND=30%	Varies over time
Service	
Labour force share at peak	Rises over time
Magnitude of change from IND=30%	Varies over time
GDP share at peak	Falls over time
Magnitude of change from IND-=30%	Varies over time
Labour Force to GDP ratio at Peak	Rises over time
magnitude of change from IND=30%	Varies over time
Agriculture	
Labour force share at peak	Falls over time
Magnitude of change from IND=30%	Varies over time
GDP share at peak	Falls over time
Magnitude of change from IND=30%	Varies over time
Labour Force to GDP ratio at Peak	Falls over time
Magnitude of change at peak	Varies over time
Labour Force Activity (Males 35-39)	
Labour force share at peak	Falls over time
Magnitude of change from IND=30%	Varies over time

Because GDP per capita data in the Penn World Tables does not extend back before 1950, recent historical estimates from Maddison (1995) are employed, in some tests though data exist for only 28 of 45 countries.

Countries whose manufacturing labour force has peaked are listed in table 5-4. They include countries that reached a maximum industrial labour force, followed by several years of decline, *and* a manufacturing labour force which shrunk between 1980 and 1990. The latter stipulation means that countries with small but shrinking manufacturing labour forces, such as Trinidad and Tobago, Kuwait, and the United Arab

Table 5-4 Country Sample for the Manufacturing Employment Peak

	CODE	TYPE	Share of World Population	Year of Manufacturing Employment Peak	Year Industrial Labour Force Share Reached 30%
ARGENTINA	ARG	NIC0	0.6385	1975	1948
AUSTRALIA	AUS	OIC	0.3745	1954	1906
AUSTRIA	AUT	OIC	0.1918	1973	1916
BARBADOS	BRB	NIC1	0.0054	1983	1962
BELGIUM	BEL	OIC	0.3511	1947	1846
BRAZIL	BRA	SIC	2.6967	1978	maximum below 30%
CANADA	CAN	OIC	0.6129	1950	1942
CHILE	CHL	NIC0	0.2569	1967	1949
CYPRUS	CYP	NIC2	0.014	1982	1973
DENMARK	DNK	OIC	0.1464	1963	1936
FINLAND	FIN	OIC	0.1171	1974	1947
FRANCE	FRA	OIC	1.3063	1974	1907
GERMANY	DEU	OIC	2.1017	1970	1881
GREECE	GRC	NIC3	0.2036	1986	maximum below 30%
GUYANA	GUY	SIC	0.0192	1970	maximum below 30%
IRAN	IRN	SIC2	0.9593	1983	maximum below 30%
IRELAND	IRL	NIC2	0.0782	1974	1968
ISRAEL	ISR	NIC0	0.0768	1965	maximum below 30%
ITALY	ITA	NIC1	1.3764	1974	1943
JAPAN	JPN	NIC1	2.7647	1973	1961
KOREA, SOUTH	KOR	NIC3	0.8213	1989	1984
KUWAIT	KWT	NIC0	0.0252	1977	maximum below 30%
LUXEMBOURG	LUX	NIC0	0.0095	1968	maximum below 30%
MALTA	MLT	NIC0	0.0073	1979	maximum below 30%
MAURITIUS	MUS	NIC3	0.0205	1988	1982
MEXICO	MEX	NIC3	1.5096	1980	maximum below 30%
NETHERLANDS	NLD	OIC	0.4403	1954	1884
NEW ZEALAND	NZL	OIC	0.0788	1965	1901
NORWAY	NOR	OIC	0.1116	1965	1938
PANAMA	PAN	SIC	0.0439	1980	maximum below 30%
PORTUGAL	PRT	NIC2	0.2051	1985	1962
PUERTO RICO	PRI	NIC1	0.0744	1969	1962
SINGAPORE	SGP	NIC2	0.0541	1981	1969
SOUTH AFRICA	ZAF	NIC2	0.6648	1980	1969
SPAIN	ESP	NIC2	0.8725	1975	1957
SURINAME	SUR	SIC	0.0101	1970	maximum below 30%
SWEDEN	SWE	OIC	0.2384	1963	1918
SWITZERLAND	CHE	OIC	0.1756	1965	1900
SYRIA	SYR	NIC4	0.1996	1981	maximum below 30%
TAIWAN	TAI	NIC2	0.3939	1987	1971
TRINIDAD & TOBAGO	TTO	NIC0	0.0244	1980	maximum below 30%
UNITED ARAB EMIRATES	ARE	NIC1	0.0228	1970	1961
UNITED KINGDOM	GBR	OIC	2.0823	1955	1841
UNITED STATES	USA	OIC	6.7903	1953	1897
URUGUAY	URY	NIC2	0.0663	1979	maximum below 30%

Emirates are included. Since no former centrally-planned countries were included for the AG=60% and IND=20% benchmarks, the Czech Republic and Hungary were omitted from the final study. Separate studies with data weighted by population share are also done. As noted in chapter three, the two studies test different phenomena; the unweighted data show changing patterns between political entities, while the weighted studies estimate the change in the world's labour force pattern.

V. Changing Rates of Structural Transformation: Time between Benchmarks

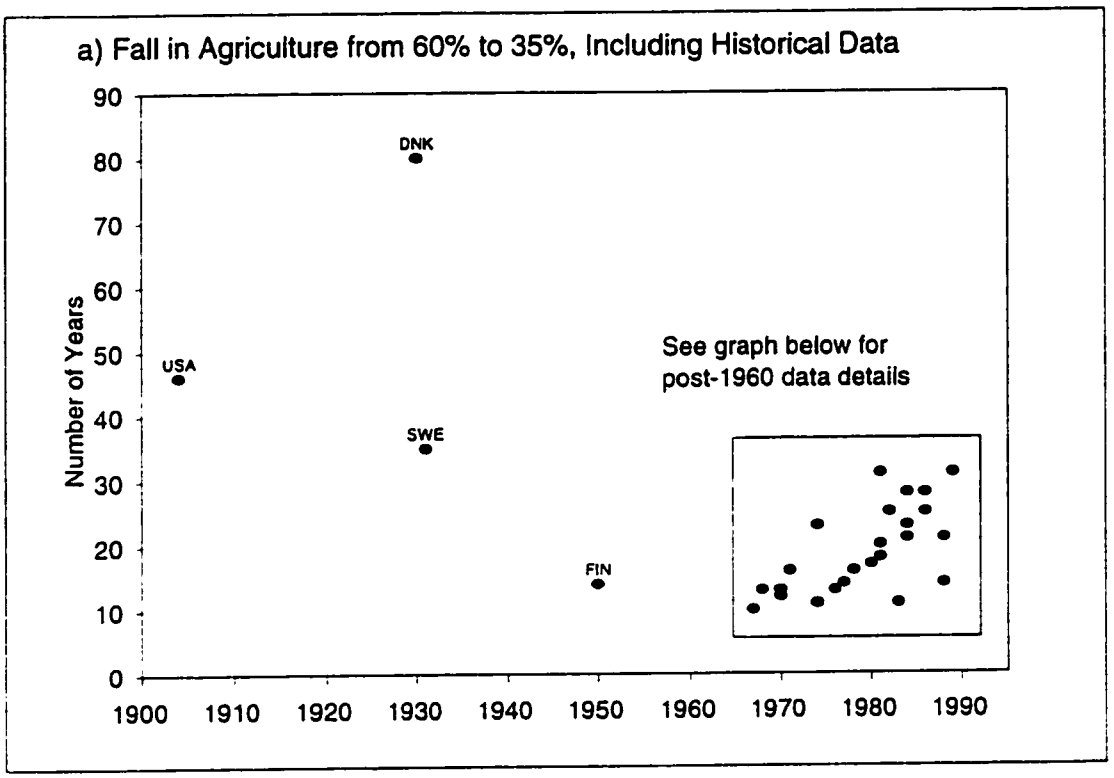
This section examines intercountry variation in the time taken to reach specific benchmarks. Two general patterns emerge: there is both an acceleration in the rate of structural transformation between OICs and other countries; and two roughly defined groupings of countries after World War II. A simple comparison of the number of benchmarks a country passes between 1950 to 1990 also provides some indication of the rate of structural transformation (Appendix III). South Korea is distinct for having passed all seven benchmarks in 40 years. In 1950, 6% of South Korea's labour force was in industry, and over 60% in agriculture; by 1989 manufacturing employment share was declining. Unfortunately, data from before 1964 are not available for Taiwan, whose transformation was also rapid. The other group of countries which matches this rate of structural transformation is the former centrally-planned economies. Six countries pass at least five benchmarks in 40 years: the former Bosnia-Herzogovina, Bulgaria, Croatia, Lithuania, and Moldova, joined by Algeria, Libya, and Saudi Arabia. A further 17 countries pass four benchmark values, including seven formerly centrally-planned economies, Georgia, Hungary, Kyrgyzstan, Macedonia, Romania, Slovenia, and

Yugoslavia. Three newly post-industrial countries also pass four benchmarks including Japan, Portugal and Spain.

Figure 5-4 graphs the number of years taken to pass the labour force benchmarks of AG=60% to AG=35%, AG=35% to AG=20%, and IND=20% to IND=30%, against the final benchmark year. Historical data are graphed beside a detail of post World War II data so that post-war variation can be seen more clearly. Note that country codes can be found in Appendix IV. The most obvious feature of the graphs is the acceleration of structural transformation benchmarks between the older OICs and other countries. The second most obvious feature, as mentioned above, is the difference between the centrally-planned economies and other countries. Finland is the OIC most like the non-OICs with respect to its rate of transformation, though after 1960, there is little notable difference in countries' rates of structural transformation for AG=35% to AG=20%. Variation in the pace of structural transformation between formerly centrally-planned countries and others is of some interest, particularly given Krugman's (1994) prediction that the rapidly industrialising Asian countries would experience a similar crisis. However, the very large time difference between the OIC transformation and all other countries is of particular importance, with respect to the central hypothesis of this thesis.

Simon Kuznets (1957) first hypothesised that incomes diverged before converging in structural transformation, convergence being the result of social changes in demand catching up to economic changes. Despite inconclusive evidence (ex: Thomas, 1994: 20), this hypothesis still holds widespread favour. For example, Nancy Birdsall (1998: 92), the executive president of the Inter-American Development Bank, recently argued against quick fixes to inequality on its basis.

Figure 5-4 Changing Rates of Structural Transformation: Number of Years for the Agricultural Labour Force to Decline from 60% to 35%



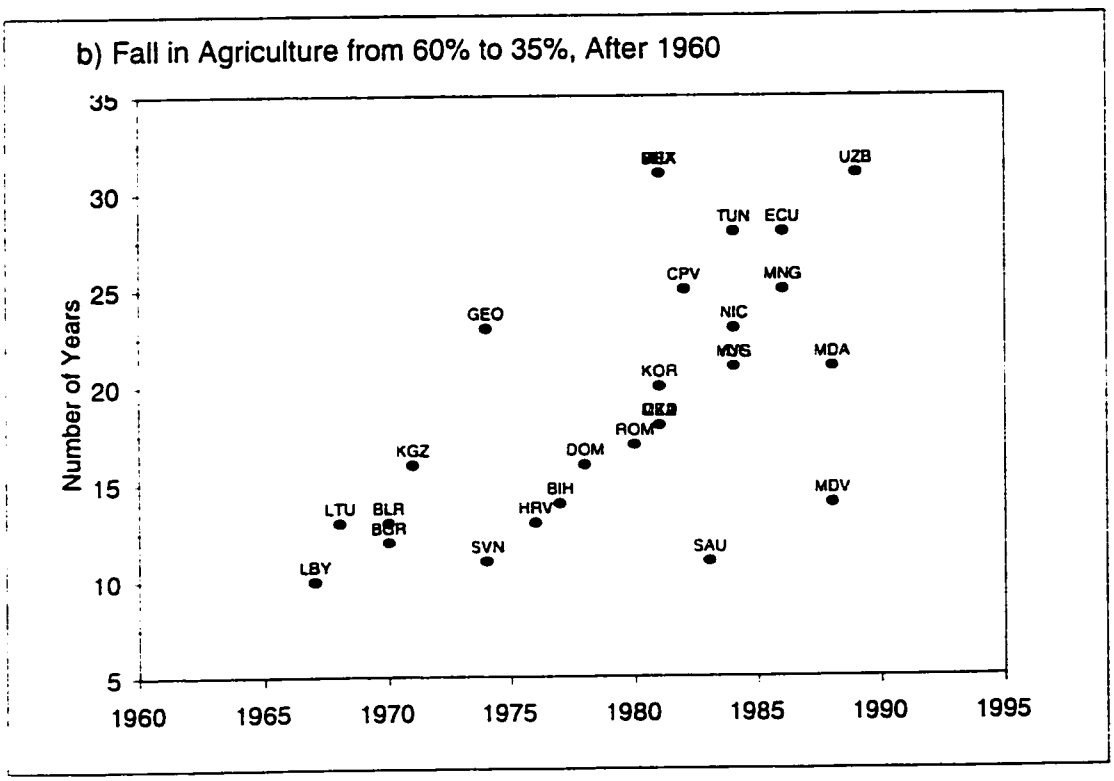
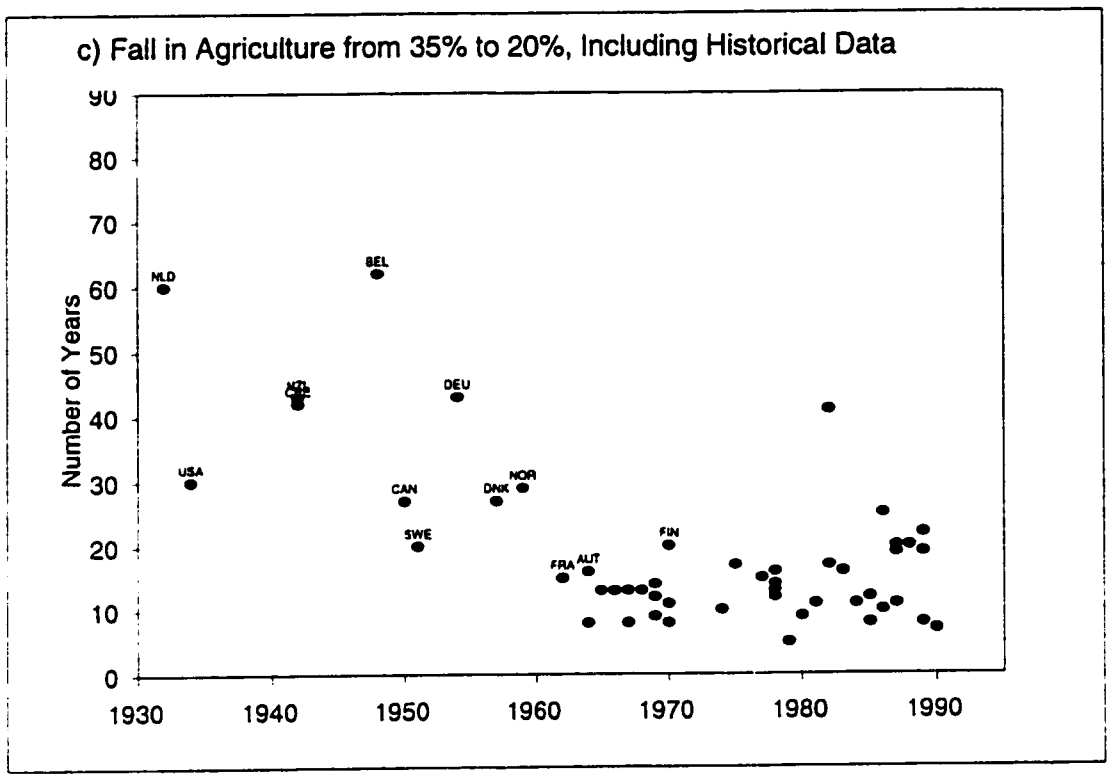


Figure 5-5 Changing Rates of Structural Transformation: Number of Years for the Agricultural Labour Force to Decline from 35% to 20%



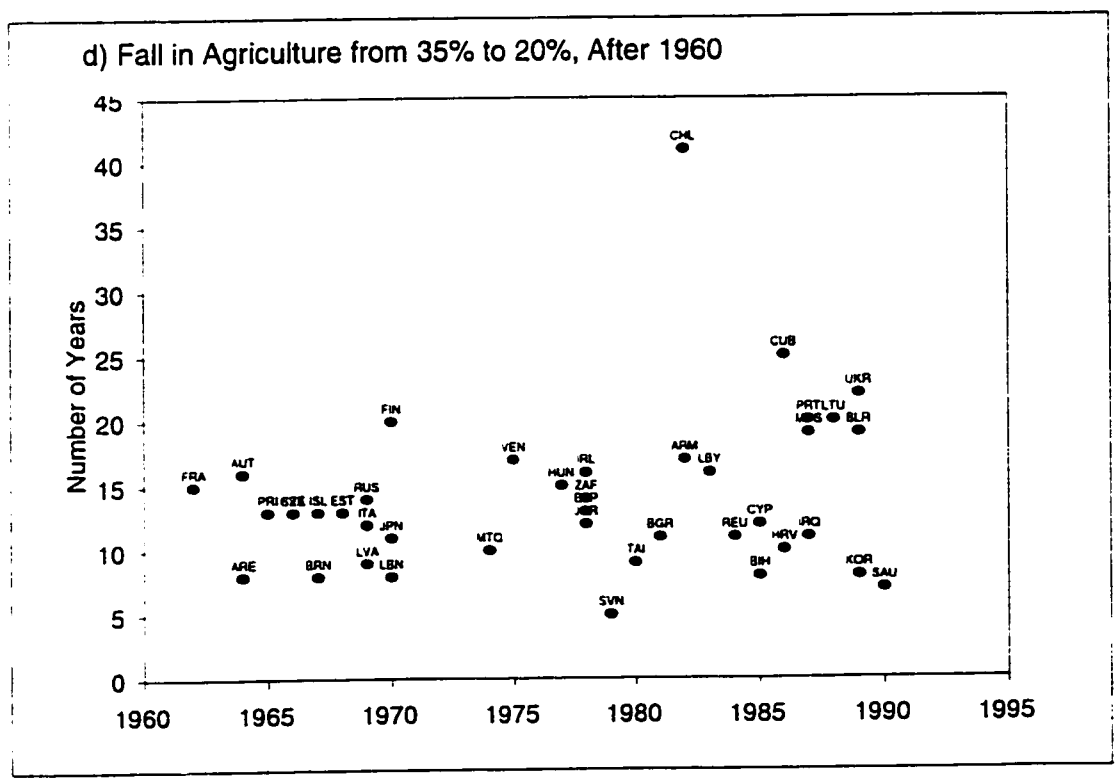
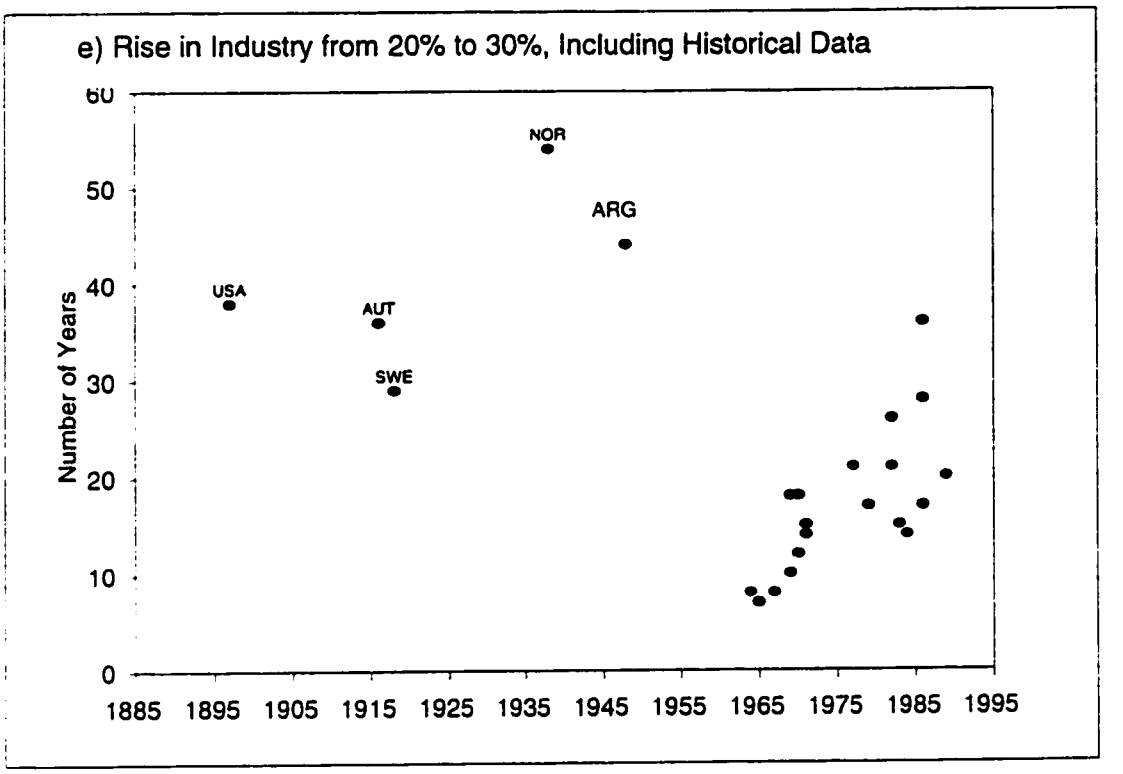
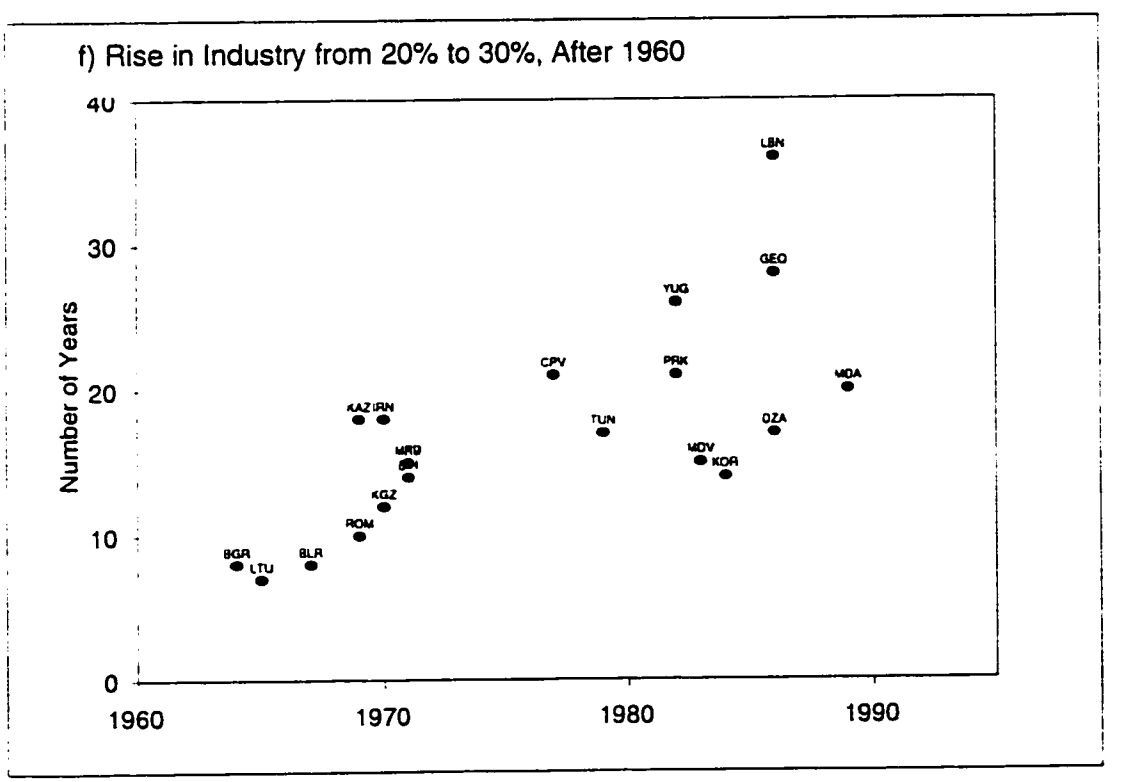


Figure 5-6 Changing Rates of Structural Transformation: Number of Years For the Industrial Labour Force to Rise from 20% to 30%





> Belying Marx, the biggest story of the last 150 years has been the emergence in the West of a prosperous and stable middle class. But it took time. During a long transition from agriculture to industry, changes in production and the structure of employment caused wrenching inequality... Much inequality today may be the natural outcome of what is an analogous transition from an industrial to an information age.

Firstly, it needs to be remarked that 'time' as defined here by production and employment changes, omits the history of social debate and conflict. Secondly, it would appear that time is what many of the NICs and SICs may not have, neither with respect to transformation from agricultural to industrial societies, nor from mixed agricultural and industrial societies to so-called information societies. Chapter 6 gives the detailed results of changes in indicator values over time, including a measure of the amount of time a country's labour force is predominantly 'industrial'.

VI. Summary

The cross-sectional study in chapters three and four confirms the continuation and acceleration of a shift in structural transformation patterns. However, the model provides only an indirect test of rising capital-intensity and falling incomes in industry. Time series data of GDP share and the ratio of labour force share to GDP share (LF:GDP) will be examined more fully to identify a change in the social status of industrial labour. Labour force participation rates will also be examined for change over time.

The ratio of industrial LF:GDP is expected to fall below 1.0 over time as industrial labour requirements decline, but industrial GDP rises with rising capital-intensity. By contrast, the service LF:GDP ratio is expected to rise above 1.0 over time, as people increasingly enter this labour-intensive sector, but its GDP share declines.

Agriculture will also be examined, but no specific pattern for the LF:GDP share is hypothesised; labour force is known to decline over time, but capital-intensity and GDP share may be more variable.

Full time series are not examined for two reasons. There are few countries with complete series, and existing series show highly variable patterns, which makes modelling difficult. So cross-sectional snapshots are taken of countries at similar stages of structural transformation, to test for relative changes in sectoral and income patterns. The specific stages, or benchmark values used are: the years agricultural labour force share = 60%; industrial labour force = 20%; and manufacturing employment share peaks.

The first two benchmarks, plus four others, are also used to group countries for further descriptive analysis. Five general groups are identified: OICs; NICs, with four sub-groups (NIC0, NIC1, NIC2, NIC3, NIC4); SICs, with two sub-groups (SIC1, SIC2); rapidly industrialising countries (RIC); and LICs. NICs are divided according to the year the industrial labour force share reached 30%, or began to decline, whichever came first. SICs are subdivided according to agricultural labour force share. Patterns of change for LICs cannot be measured, since they cross no benchmarks, but the implications of any results are most important for them.

A simple analysis of the number of years between each benchmark confirms a major reduction in the rate of structural transformation between OICs and other countries. It also reveals that many former centrally planned countries transformed at a very high rate compared to most other later industrialisers. The increase in the rate of structural transformation raises questions about the ability of NICs, SICs and LICs to close the income gaps that the OICs closed over 150 years.

CHAPTER SIX

RESULTS II: CHANGES OVER TIME

Cross-sections of the three new indicators at the structural transformation benchmarks bear out both the general and specific hypotheses being tested. The general hypothesis that structural transformation is changing is upheld, as is the specific hypothesis that labour is decreasingly important in the high-income-generating sector of industry. For NICs and SICs, which cross the labour force benchmarks of agriculture=60% (AG=60%) and industry=20% (IND=20%), the ratio of industrial labour share to industrial GDP share (LF:GDP) tends to fall below 1.0 over time, the industrial labour force tends to be smaller, and industry's share of GDP tends to be higher. For service activity, on the other hand, the LF:GDP ratio generally rises towards 1.0. But the contribution of service to GDP is lower over time, even as the labour force becomes larger. Overall, the emerging labour force is entering services, rather than industry, as was demonstrated by the *expansion method* in chapter four. What emerges in this second set of tests, is a clear decline in the service GDP share over time, while industry's GDP share rises. Labour is increasingly being absorbed into the lower income sector.

The manufacturing employment peak (MF PEAK) benchmark covers a different sample, comprising primarily OICs and NICs. While similar trends for industrial activity are visible, a more interesting observation is that, for some indicators, OICs and other countries show different trends. There is even a reversal of trends between the groups in some cases, though only one trend reaches significance in any comparison. This more sudden change in trend contrasts with the continual change originally hypothesised.

To simplify the discussion of results, the hypotheses listed in chapter 5 are restated at the opening of each indicator's subsection. Confirmation of the hypotheses are indicated by a checkmark, a failure to reject the null hypothesis by a dash, and an opposite trend, by an 'x'.

I. Changes in Indicator Values over Time

A. AG=60% and IND=20% Benchmarks

Table 6-1 summarises the regression slopes for all indicators against both benchmarks, while figures graph the significant regression lines in the sub-section for each indicator in sections 1 to 6. For the first two benchmarks, each pair of graphs has the unweighted data in the first graph, and unweighted data in the second. Those hypotheses for which the test results are also graphed are marked with an asterisk in the opening restatement. As can be seen from the slope values in table 6-1, results generally support the main hypothesis that the labour forces are shifting towards greater growth in the sectors with lower GDP share.

1. GDP per capita

Variable	Hypothesised Change	Results
Total GDP per capita	Rises	-

Penn World Tables data were again used for this sample. No significant trend for GDP per capita could be discerned at these two benchmarks. GDP per capita is not correlated to the significant changes in labour force share and GDP share, at least not at the early stages of structural transformation in NICs and SICs.

Table 6-1 Slope Values for Indicators at the AG=60% and IND=20% Benchmarks

Key:

Bold text**	R^2 highly significant; 1% probability
Bold text	R^2 significant; 5% probability
Regular (t)	R^2 has 6-10% probability; slope notable
Regular	R^2 has 11-35% probability; slope notable
--	Probability of R^2 greater than 35%

Indicator	Agricultural Labour Force = 60%				Industrial Labour Force = 20%			
	Unweighted		Weighted		Unweighted		Weighted	
	1950 N=20	1960 N=18	1950	1960	1950 N=21	1960 N=20	1950	1960
GDP per capita	--	--	--	-32.71	--	--	--	--
Industry								
Labour Force Share	**-0.1502****	**-0.1539****	**-0.1460****	-0.161	n/a	n/a	n/a	n/a
GDP Share	+0.1823	+0.2199	**+0.2677***	+0.4667(t)	**+0.3940***	+0.3938(t)	--	--
Labour / GDP Share	**-0.0097****	**-0.0110***	**-0.0104***	-0.0170(t)	**-0.0082****	**-0.0077***	--	--
Service								
Labour Force Share	**+0.1478****	**+0.1575****	**+0.1346***	+0.1606	**+0.2951****	**+0.2919***	+0.2555(t)	+0.2477
GDP Share	**-0.2905***	--	**-0.6303****	--	**-0.3014****	**-0.3324****	-0.2007	-0.1985
Labour / GDP Share	**+0.0060****	+0.0046(t)	**+0.0099****	0.0064	**+0.0099****	**+0.0104****	+0.0072(t)	+0.0070
Agriculture								
Labour Force Share	n/a	n/a	n/a	n/a	**-0.3010****	**-0.2949***	-0.2556(t)	-0.2139
GDP Share	--	--	+0.3627(t)	-0.3611	--	--	--	+0.2033
Labour / GDP Share	--	--	**-00.470***	--	--	--	--	-0.0376
Male Activity (age 35-59)	**+0.0239***	+0.0252(t)	+0.0106	--	+0.0227(t)	+0.0207	+0.0364	+0.0434(t)

Note: These results are graphed in figures 6-1 to 6-7 along with R^2 values and probabilities of error. Countries in the sample plus the benchmark year are in table 5-2.

2. Industry

Variable	Hypothesised Change	Results
Labour force*	Falls	✓
Share of GDP*	Rises	✓
Labour force to GDP ratio*	Falls	✓

Industrial changes for labour force share, GDP share, and the LF:GDP ratio emerge as hypothesised. A smaller industrial labour force size is associated with agricultural labour force shares of 60% over time (figure 6-1). Note that country codes can be found in table 5-2 (p. 119). The results are essentially a restatement of the patterns identified in chapter 4, where labour was found to shift more quickly out of agriculture a low GDP per capita.

What is more interesting is that industrial GDP share shows a relative *increase* at the same agricultural labour force share over time (figures 6-2, 6-4). Therefore, what is being seen is not a slower rate of industrialisation *per se*, but a smaller labour force along with a greater relative contribution by industry to total GDP. This is the critical difference which the more simple test in chapter four could not capture. It may be due to relatively smaller contributions of service and agriculture to GDP, compared to the OICs at similar stages, or it may reflect the presence of relatively higher-value industrial activity.

As can be expected from the previous two relationships, the industrial LF:GDP ratio also falls (figures 6-3, 6-5). In fact, by 1950 it is below 1.0 even for such older SICs as Brazil and Mexico. Overall, the share of labour in industrial activity is increasingly low, and surprisingly low, given its share of GDP. Levels of capital-intensity appear to increase for later industrialisation, at similar points in the agricultrual and industrial labour force shifts.

Figure 6-1 Shift in Industrial Labour Force Share over Time: AG=60%

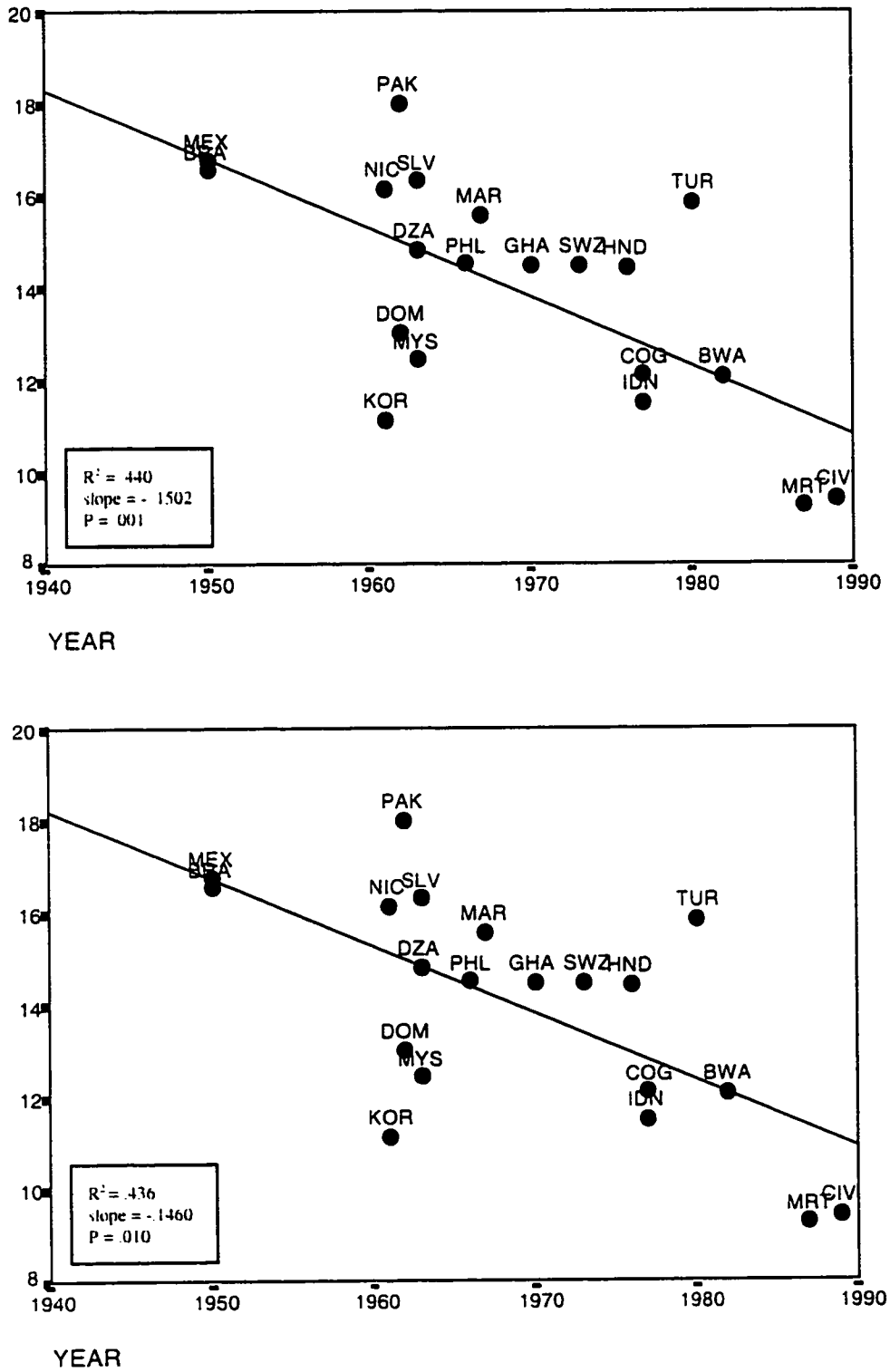
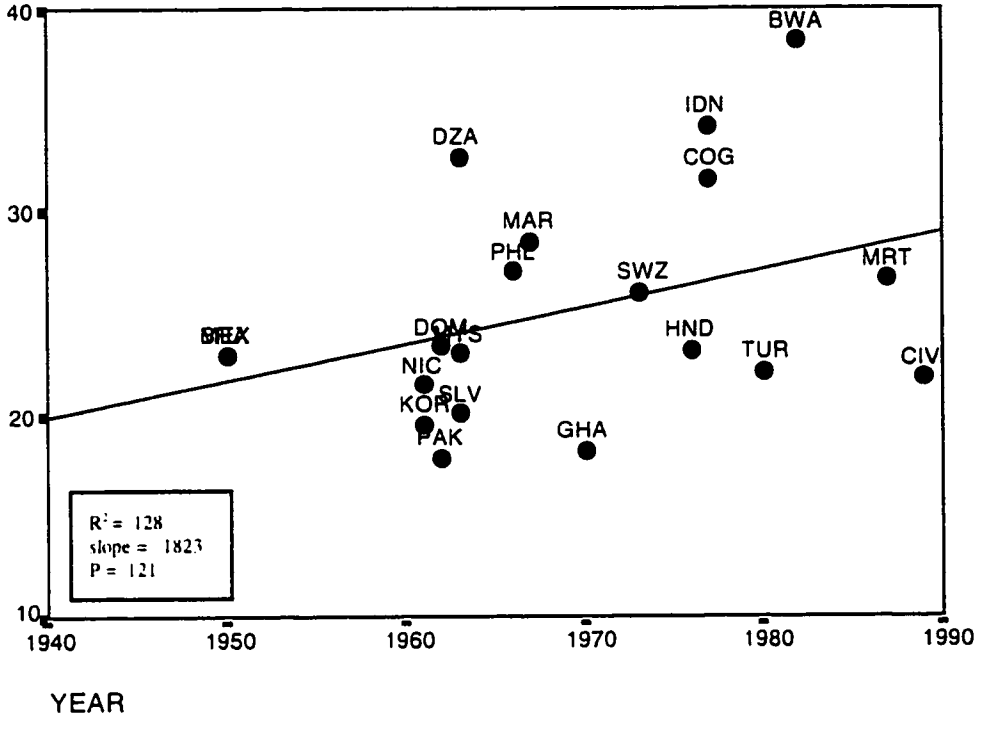


Figure 6-2 Shift in Industrial GDP Share over Time: AG=60%



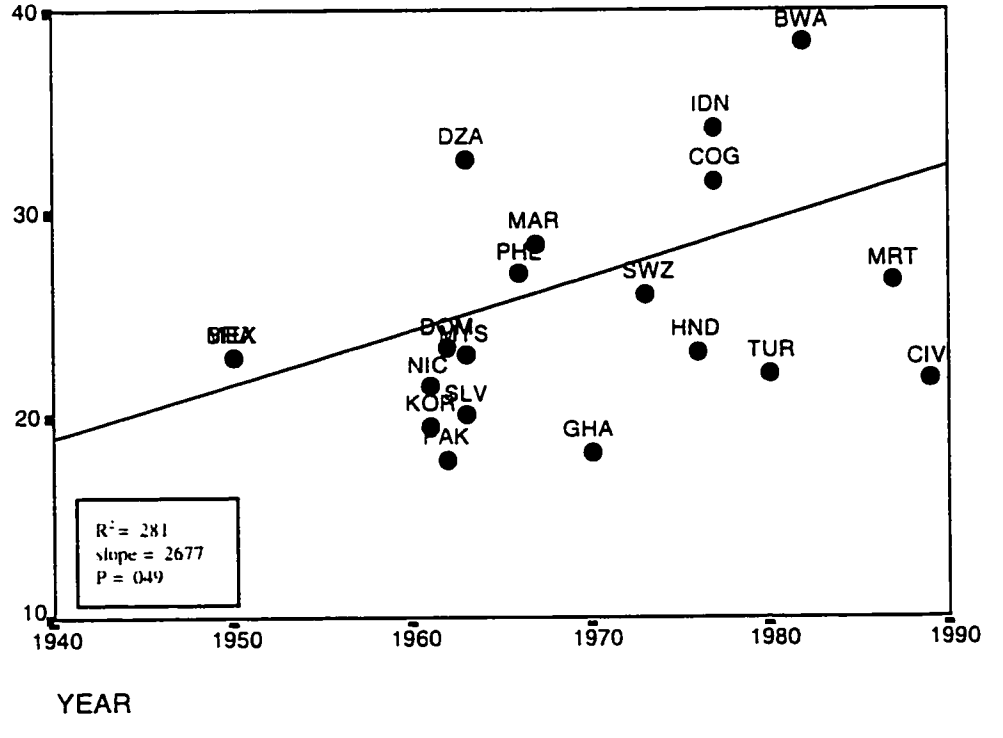
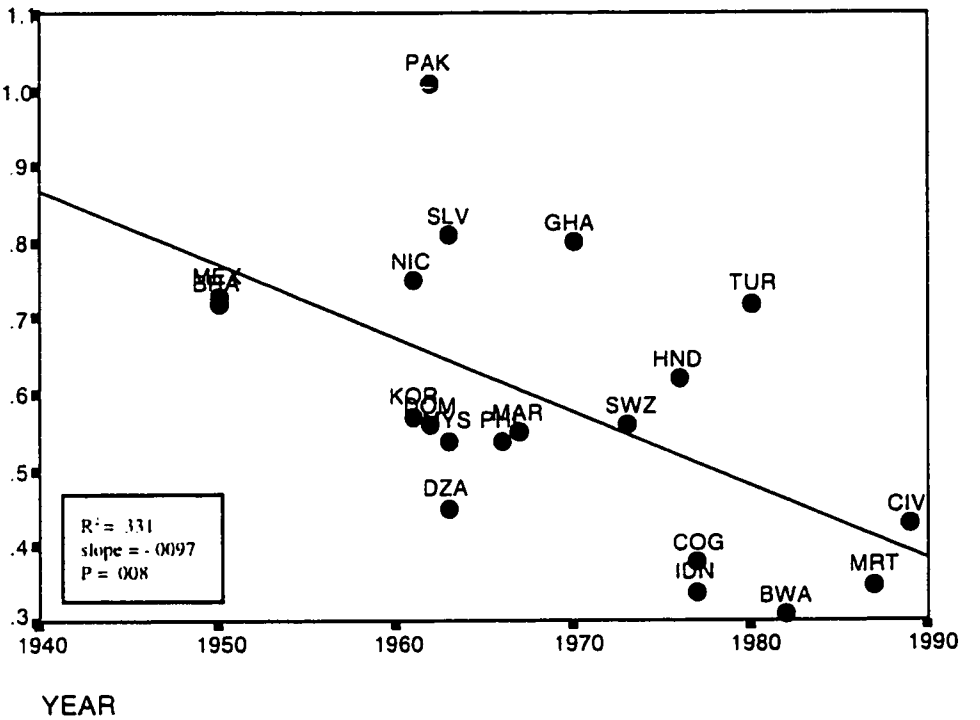


Figure 6-3 Shift in Industrial LF:GDP Ratio over Time: AG=60%, continued



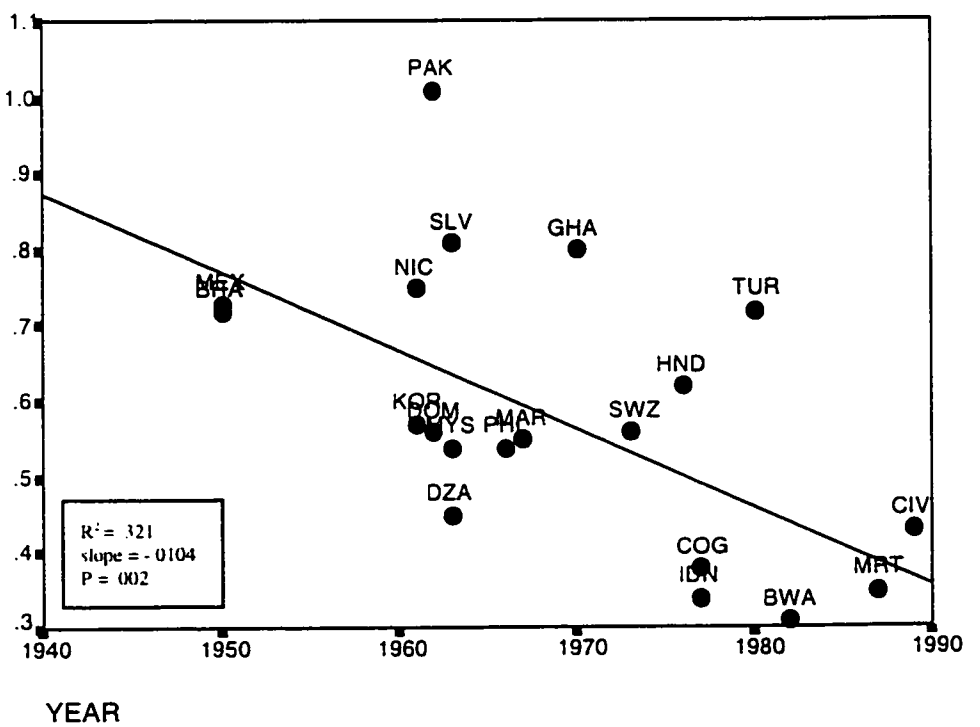
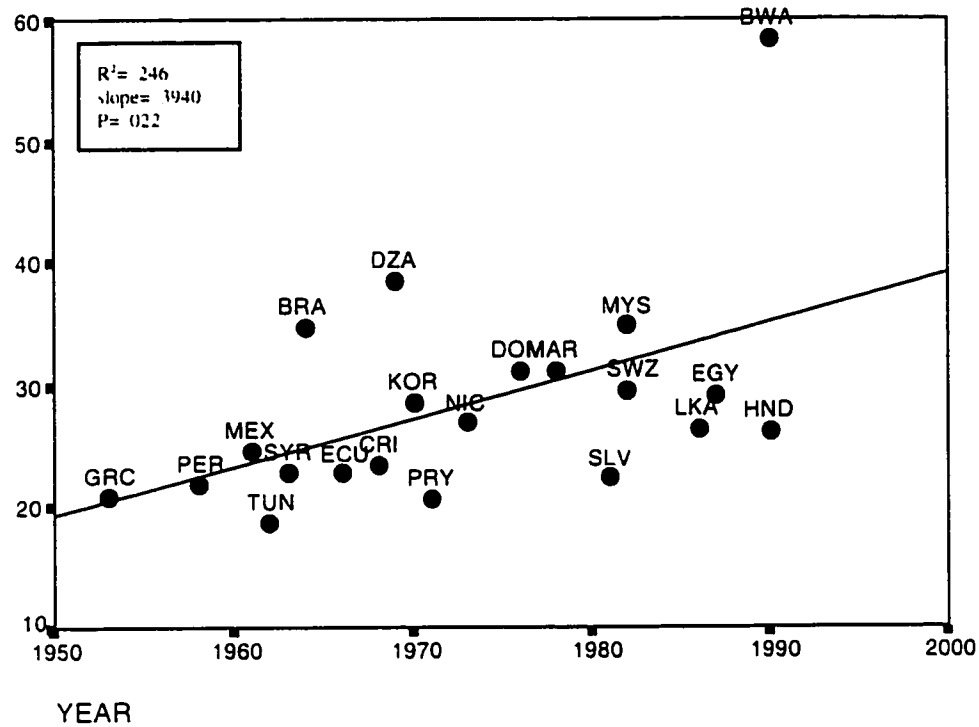


Figure 6-4 Shift in Industrial GDP over Time: IND=20%



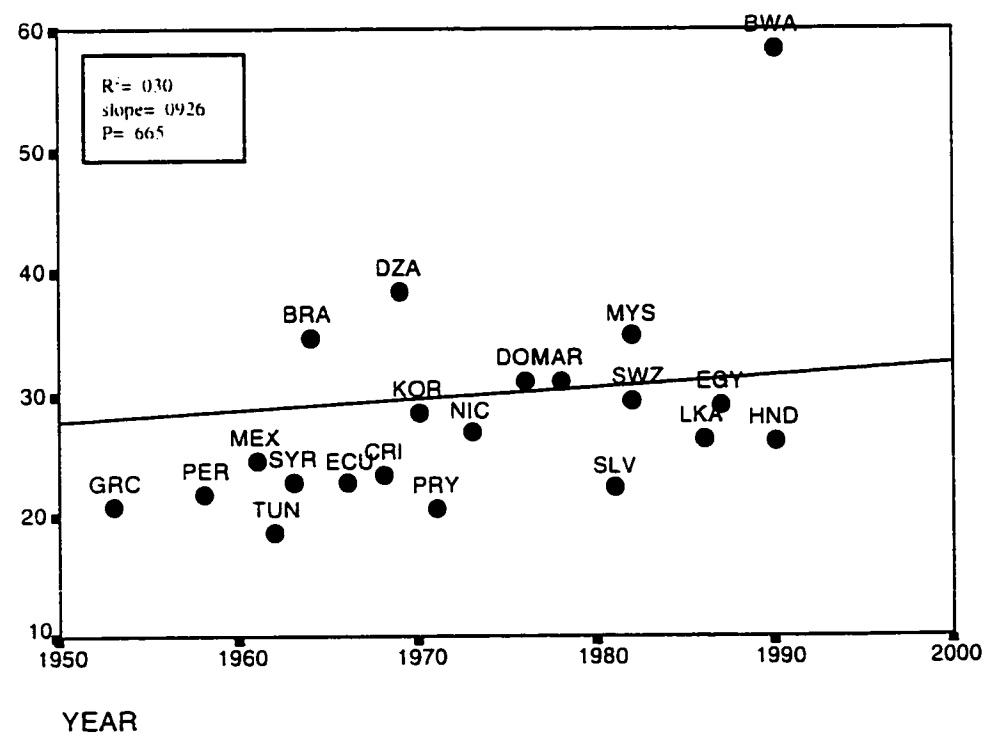
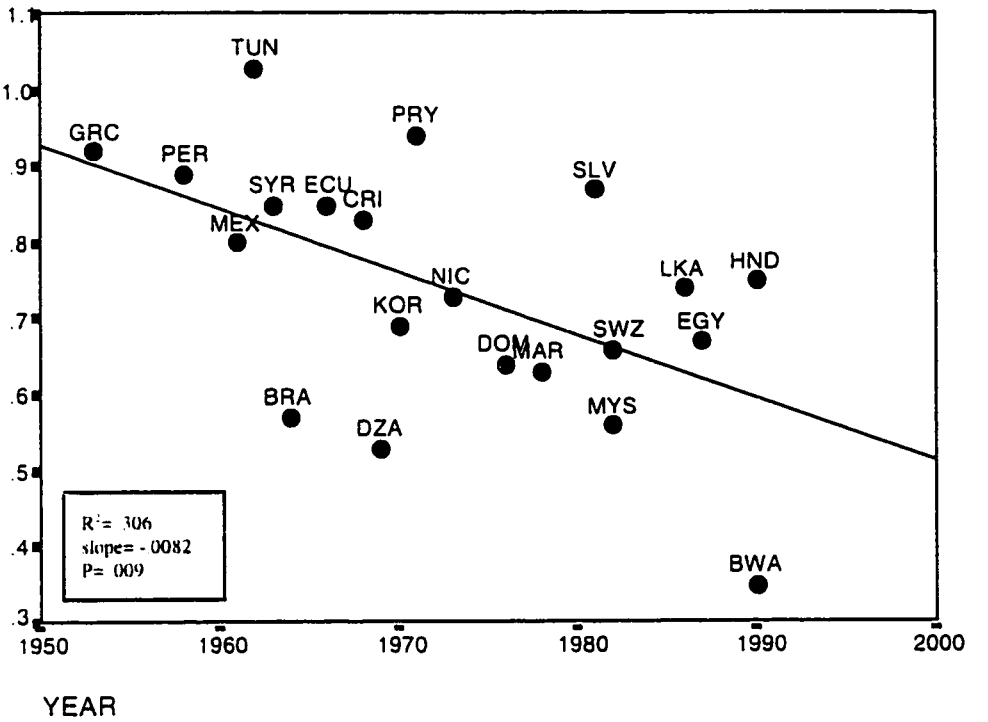
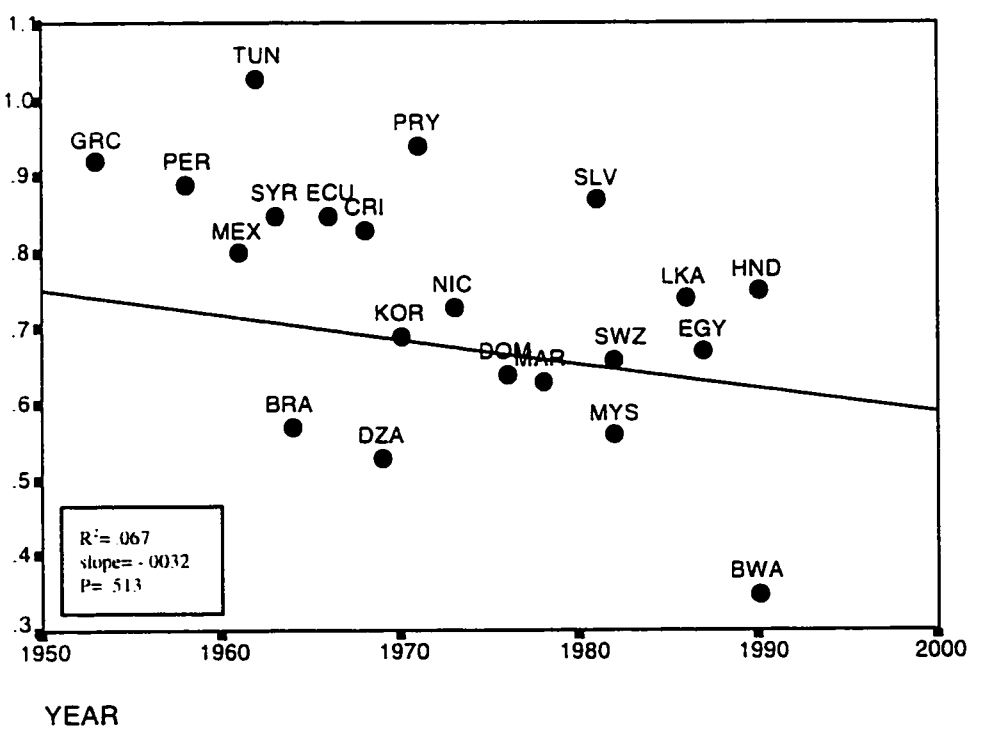


Figure 6-5 Shift in Industrial LF:GDP Ratio over Time: IND=20%





Regressions were run twice against the benchmarks, once including data for 1950 to 1990, and once including data from 1960 to 1990. Most GDP share data are from the World Bank, and extend back only to 1960, so it was considered useful to separate the tests with data from several sources. At times, the presence or absence of a single large country does affect a single test, but general patterns are consistent. For country data not weighted by population, both 1950 and 1960 runs show significant trends, except for GDP share. For weighted data, only the 1950 to 1990 run is significant. A closer examination of the data indicates that a small number of populous countries heavily influence the overall results. Indonesia (3.35% of world population), Brazil (2.5%), Mexico (1.23%), Egypt (1.00%), the Philippines (0.97%), and Korea (0.86%) are each at least twice the weight of the remaining countries (population weights are listed in table 5-2, p 119).

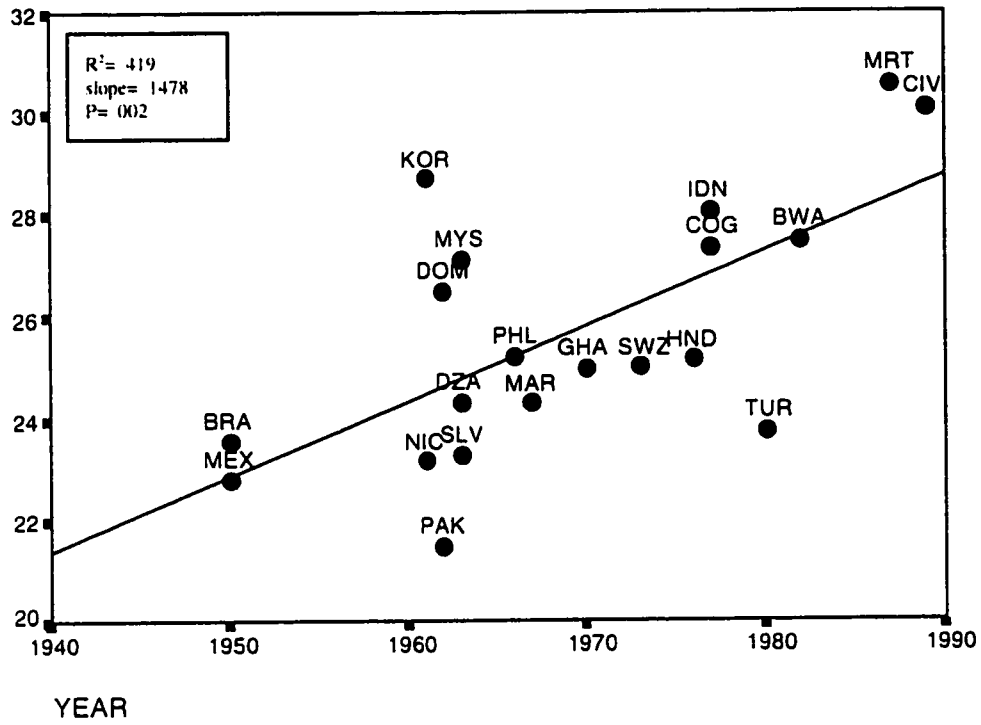
3. Services

Variable	Hypothesised Change	Results
Labour force*	Rises	✓
Share of GDP*	Falls	✓
Labour force to GDP ratio*	Rises	✓

Patterns for change in the service sector are also quite clear and support the overall hypothesis of a higher service labour force share, accompanied by relative GDP share decline (figures 6-6, 6-7, 6-9, 6-10. Unlike the OICs, where service labour force has accompanied a rise in service GDP share, the evidence is that NIC and SIC service activity is labour-intensive and accompanied by lower national income share over time. Nevertheless, there is a net rise in the LF:GDP ratio towards 1.0 (figures 6-8, 6-11). In other words, the gap between labour force share and GDP share is closing.

This narrowing, however, should be counter-balanced by noting that the LF:GDP

Figure 6-6 Shift in Service Labour Force Share over Time: AG=60%



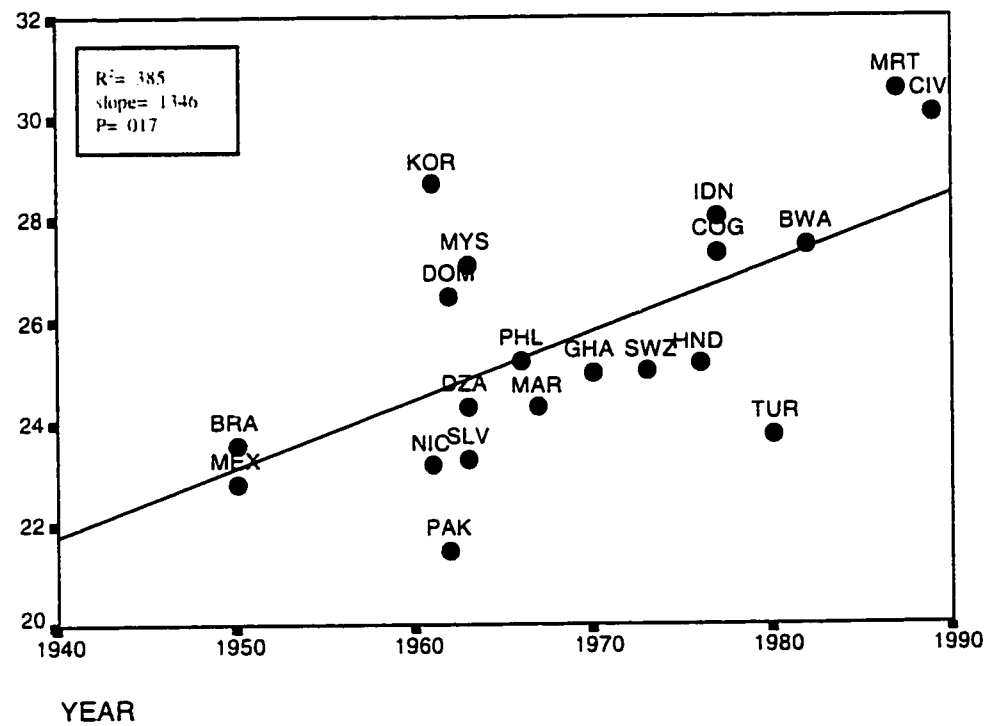
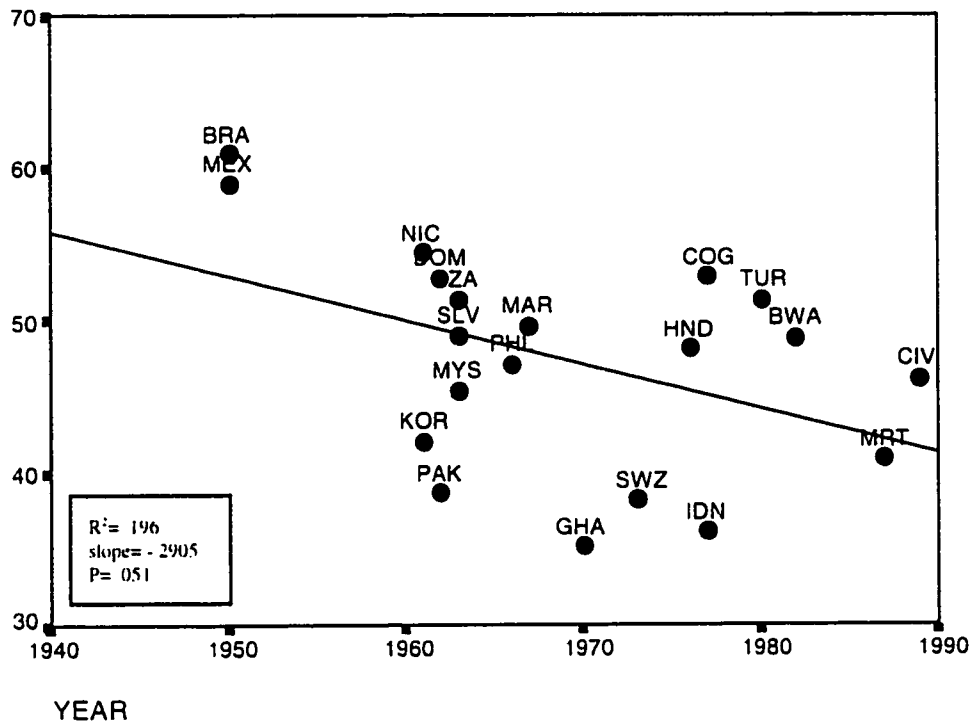


Figure 6-7 Shift in Service GDP Share over Time: AG=60%



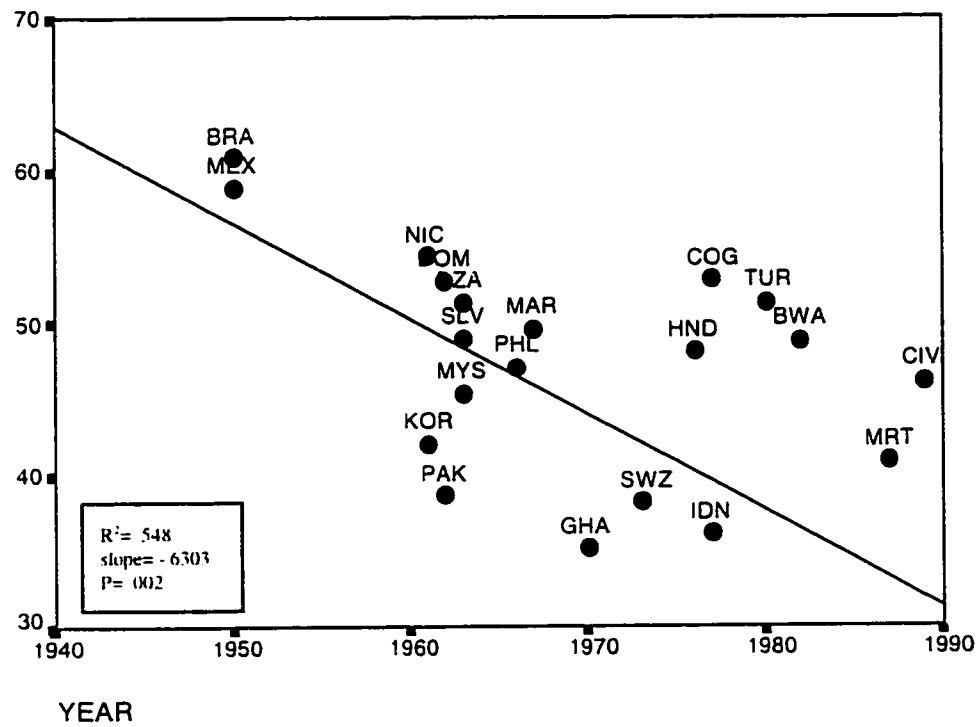
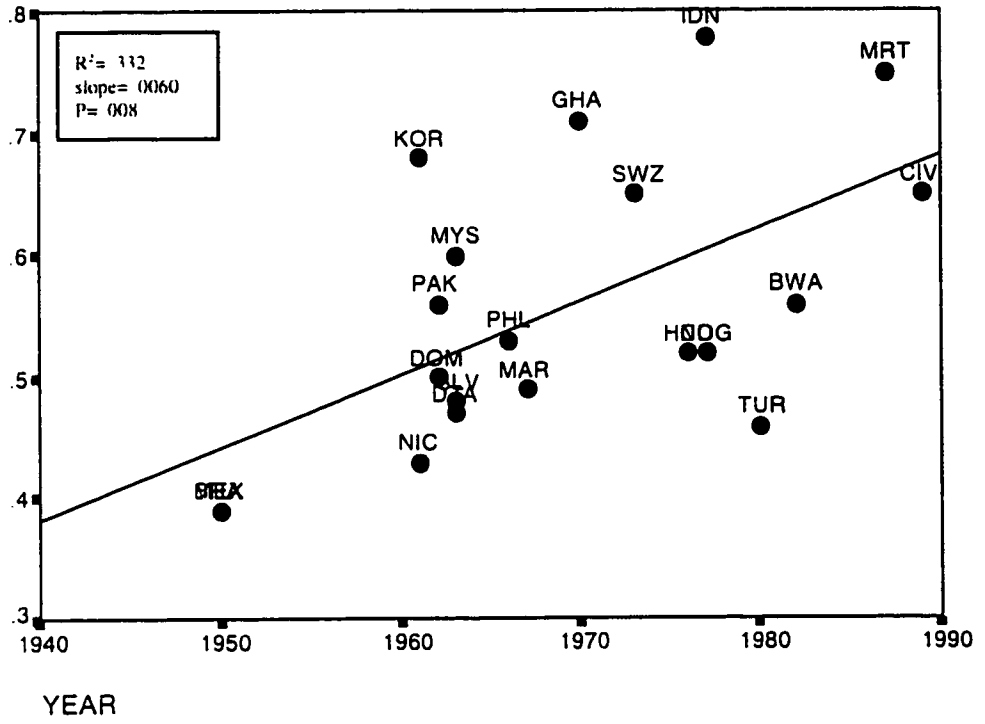


Figure 6-8 Shift in Service LF:GDP Ratio over Time: AG=60%



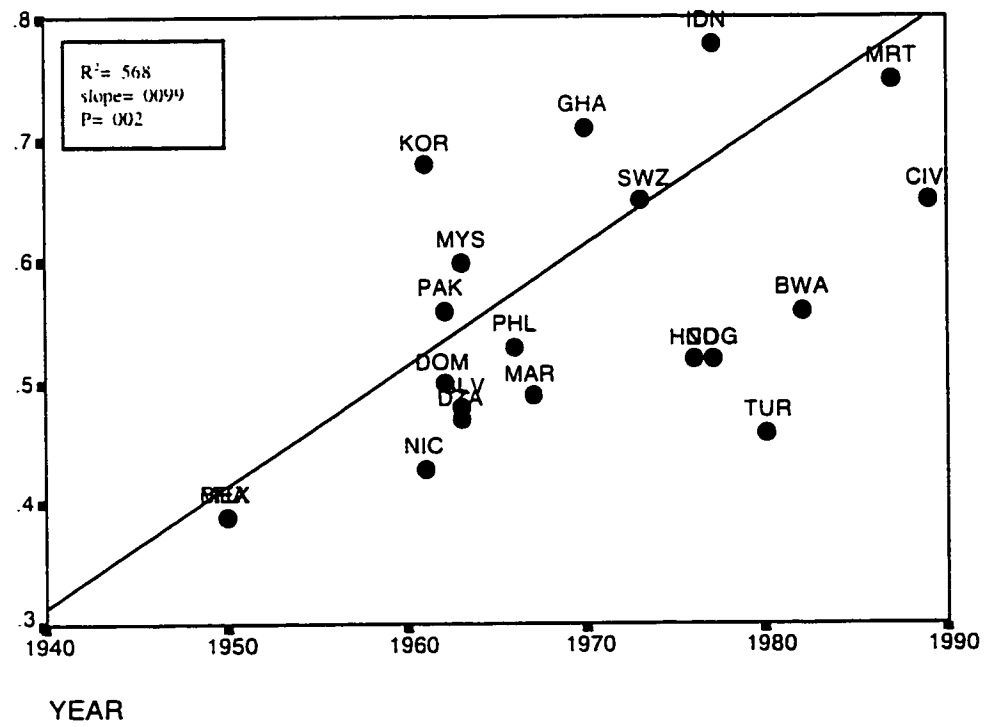
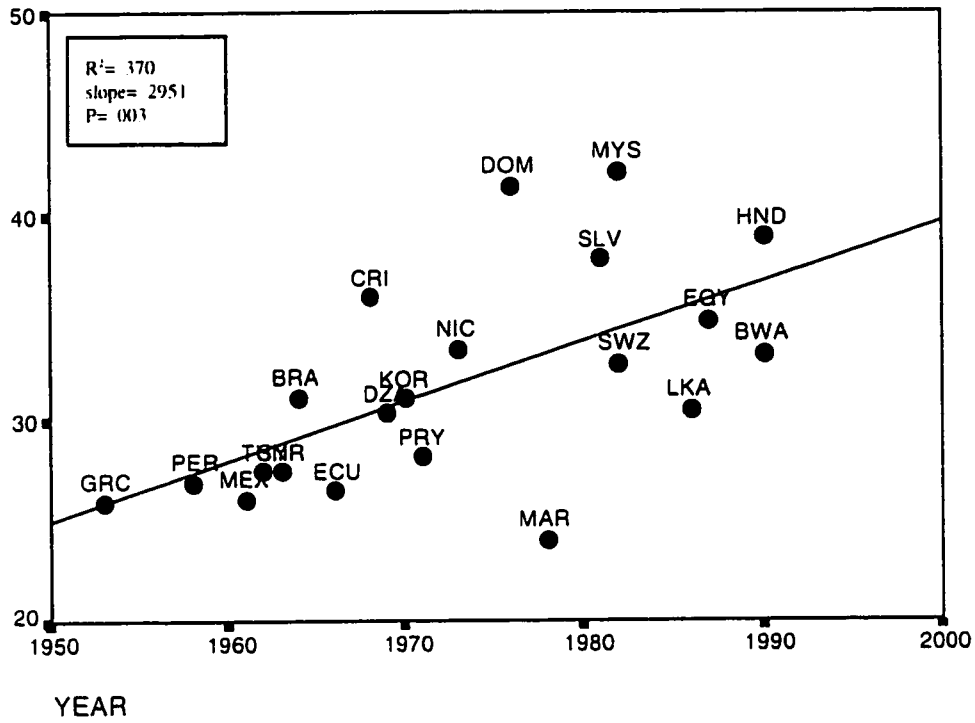


Figure 6-9 Shift in Service Labour Force Share over Time: IND=20%



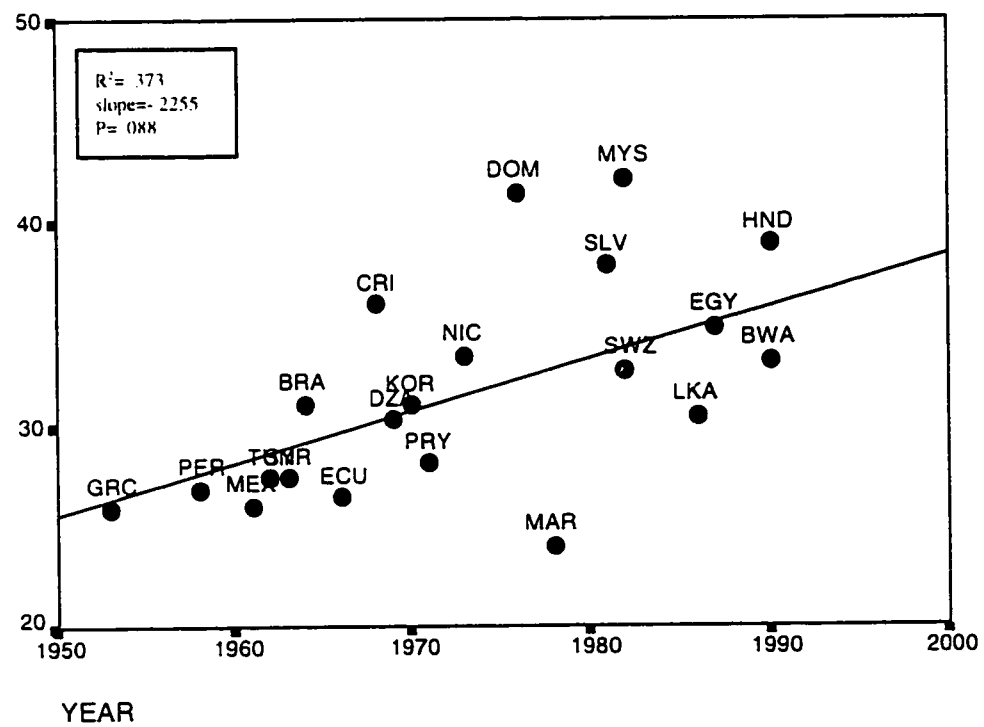
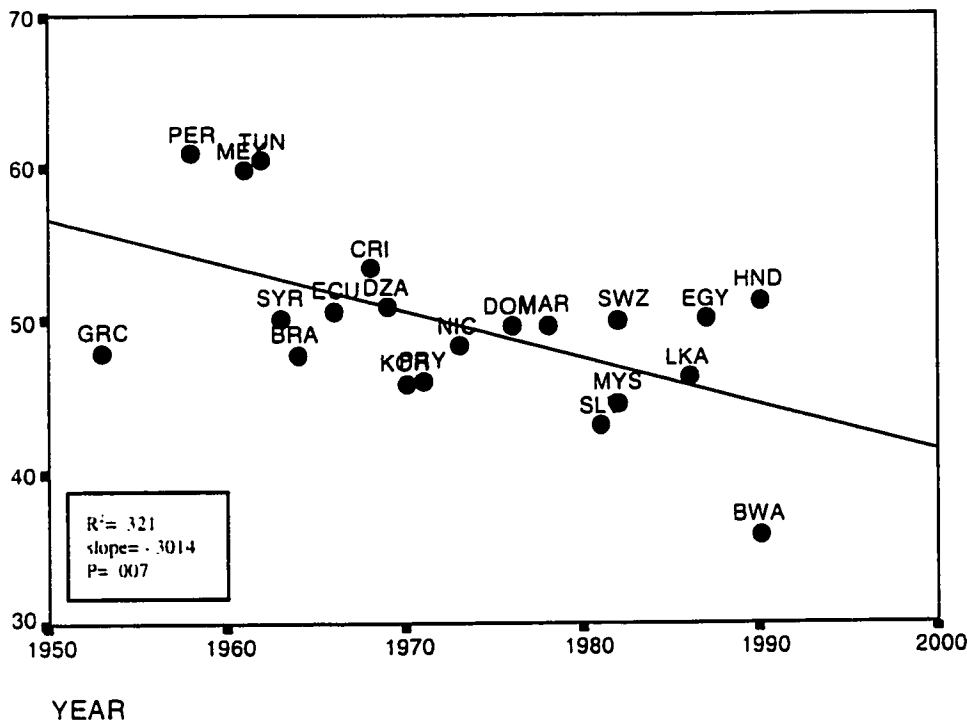


Figure 6-10 Shift in Service GDP Share over Time: IND=20%



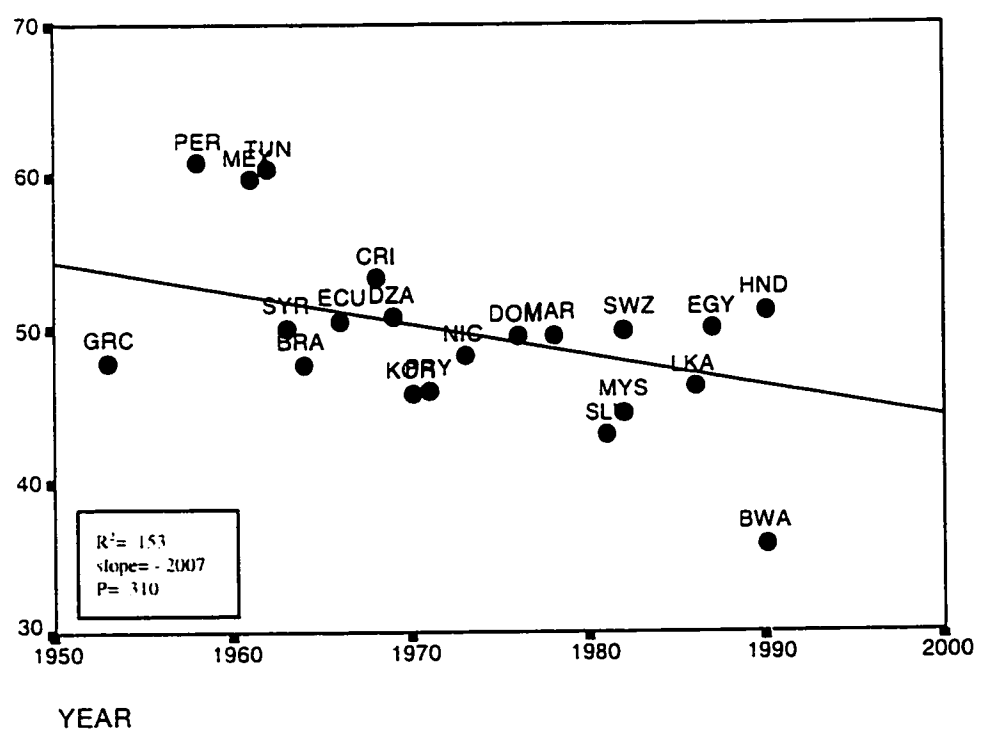
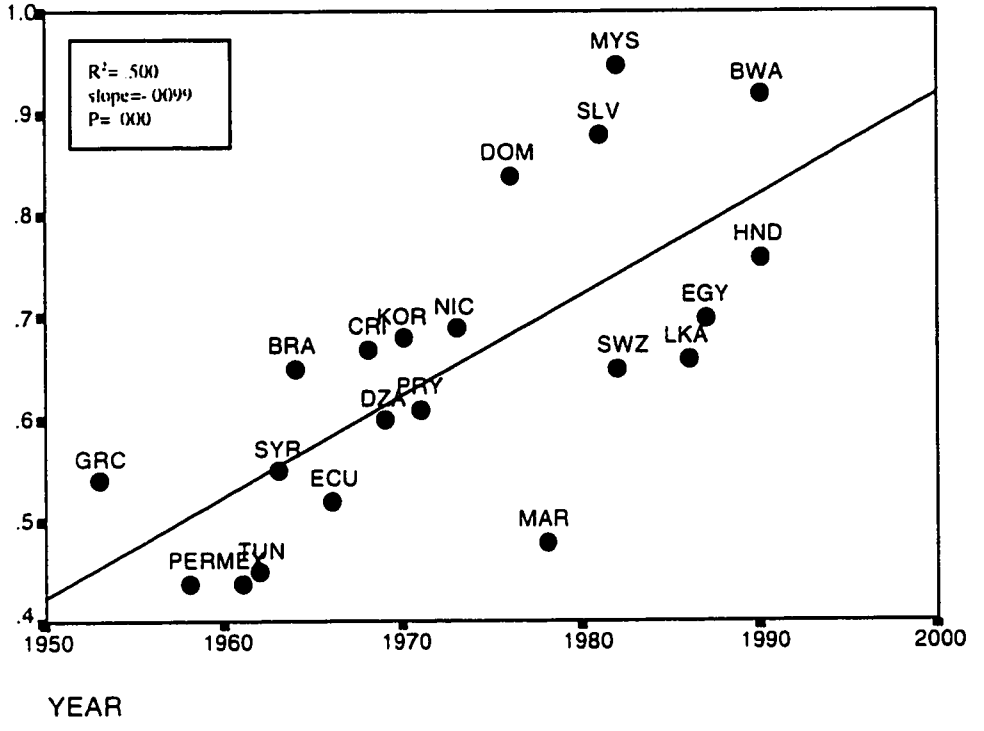
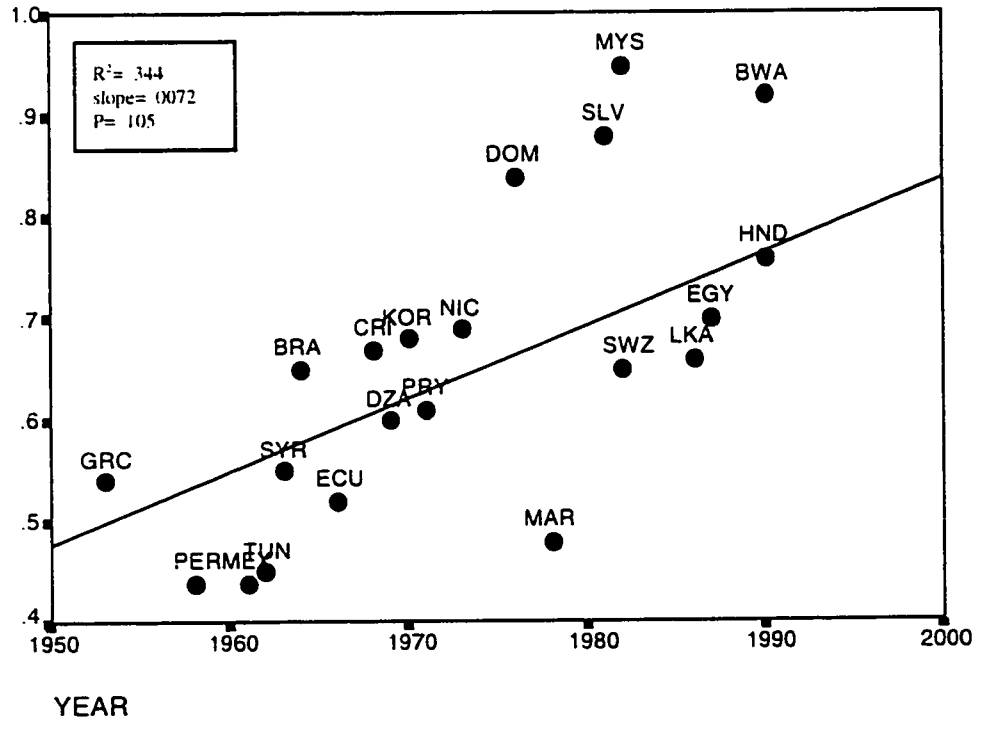


Figure 6-11 Shift n Service LF:GDP Ratio over Time: IND=20%





ratios for agriculture are very high. In other words, the rise to unity in the ratio does not so much reflect an increase in the social position of labour withing services, as the relatively lower position of labour in agriculture. What is indicated then, is a move out of highly labour-intensive agriculture into relatively higher-value services. Despite being closer in size to service labour force share, the relative contribution of service is declining.

The decline in service GDP share is an indication of its economic output relative to industry, rather than of an absolute decline in service-based national income. Recent service labour force share growth, unaccompanied by service GDP share growth, indicates that there is a weaker relationship between service activity and the growing industrial sector. This could exist either for business services or in personal services to industrial workers, or both, but cannot be tested at this level of analysis. Labour is moving into services, while income is being produced in industry. Such a change in labour-income relationships indicates that the social role of labour in societies moving out of agriculture may need to be renegotiated.

As was observed for the industrial sector, trends are stronger for the unweighted data, especially for the IND=20% benchmark. Trends for services are stronger than for the industrial sector, however. A similar effect by the populous countries on the overall trend is visible, this time with Egypt's low service LF:GDP ratio leaving prominent outliers such as the Dominican Republic, El Salvador, Malaysia, and Botswana, which have high service LF:GDP ratios in later years (figure 6-8 and 6-11).

4. Agriculture

Variable	Hypothesised Change	Results
Labour force*	Falls	✓
Share of GDP*	Varies	-
Labour force to GDP ratio*	Varies	-

Agriculture is not as important an indicator as the other two sectors, since the net movement out of agriculture has been quite constant during the early stages of industrialisation. The IND=20% benchmark confirms that movement out of agriculture is increasingly rapid (figures 6-14) at the earliest stages of transformation, as observed in Pandit and Casetti (1989) and chapters 3 and 4. India, which influences the difference in results between weighted and data for shifting agricultural patterns, is absent from this sample. There is no trend for GDP share or LF:GDP share.

5. Total Labour Force Activity

Variable	Hypothesised Change	Results
Labour force participation*	Falls	✗

Contrary to expectations, at low levels of industrialisation the labour force participation of males age 35-39 actually showed significant increase over time (figure 6-17, 6-18). This pattern contrasts with world patterns, which show a general decline (table 6-2).

There are several possible explanations for this. For example, structural adjustment programmes may have forced more people into the workforce. Rapid capitalisation of agriculture may also boost formal sector participation by members of former farm families. Generalisations are difficult to make at this level of analysis, however. As will be seen, this trend reverses for OICs and other more industrialised countries when regressed against the MF PEAK. In this case, the shift *between* benchmarks, rather than

Figure 6-12 Shift in Agricultural GDP Share over Time: AG=60%

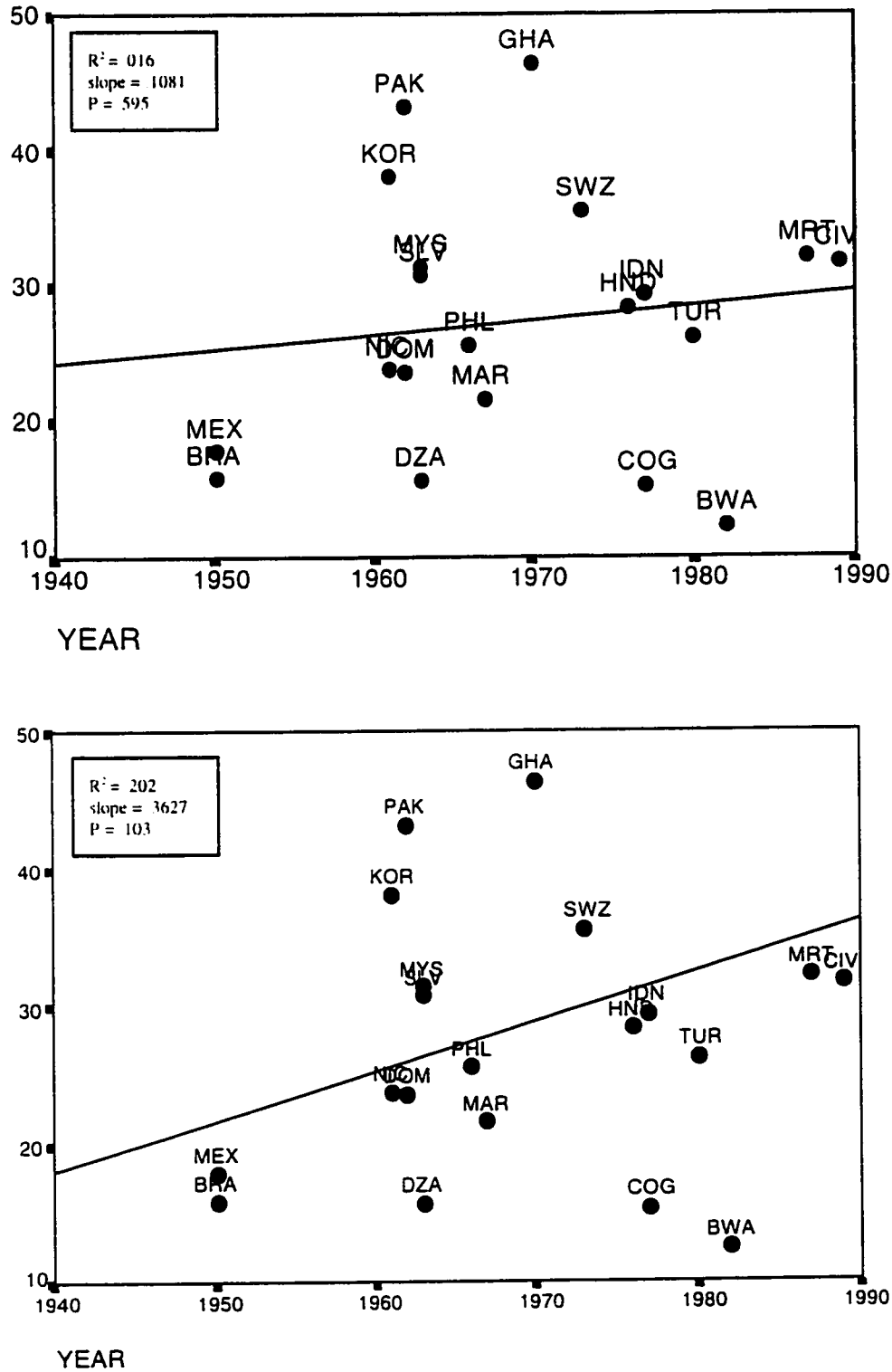
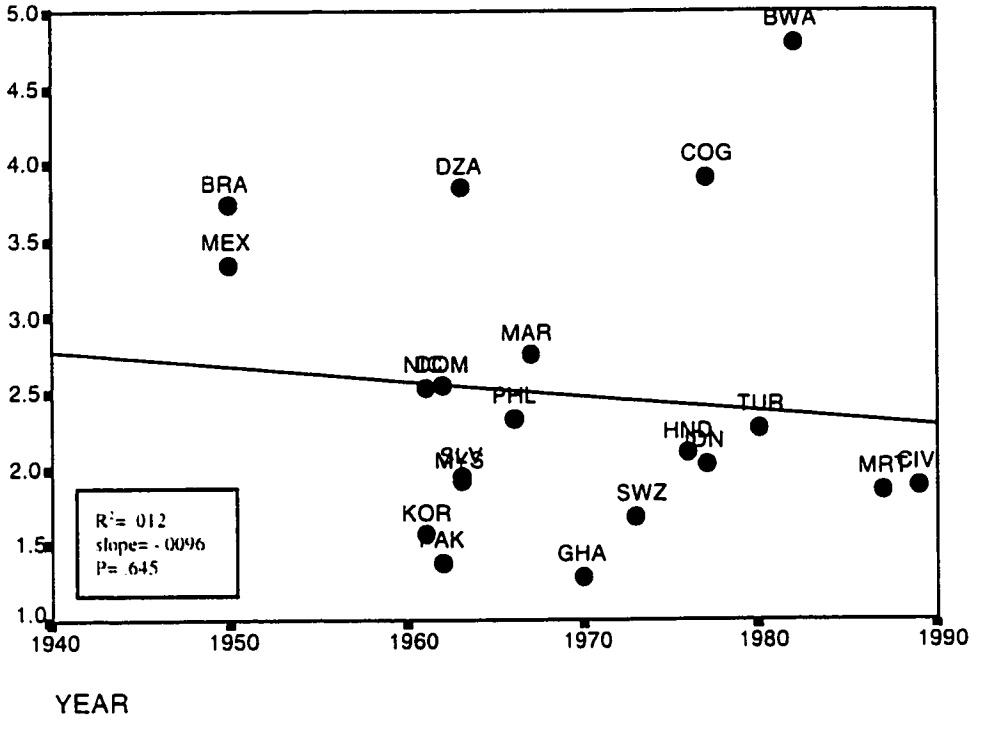


Figure 6-13 Shift in Agricultural LF:GDP Ratio over Time: AG=60%



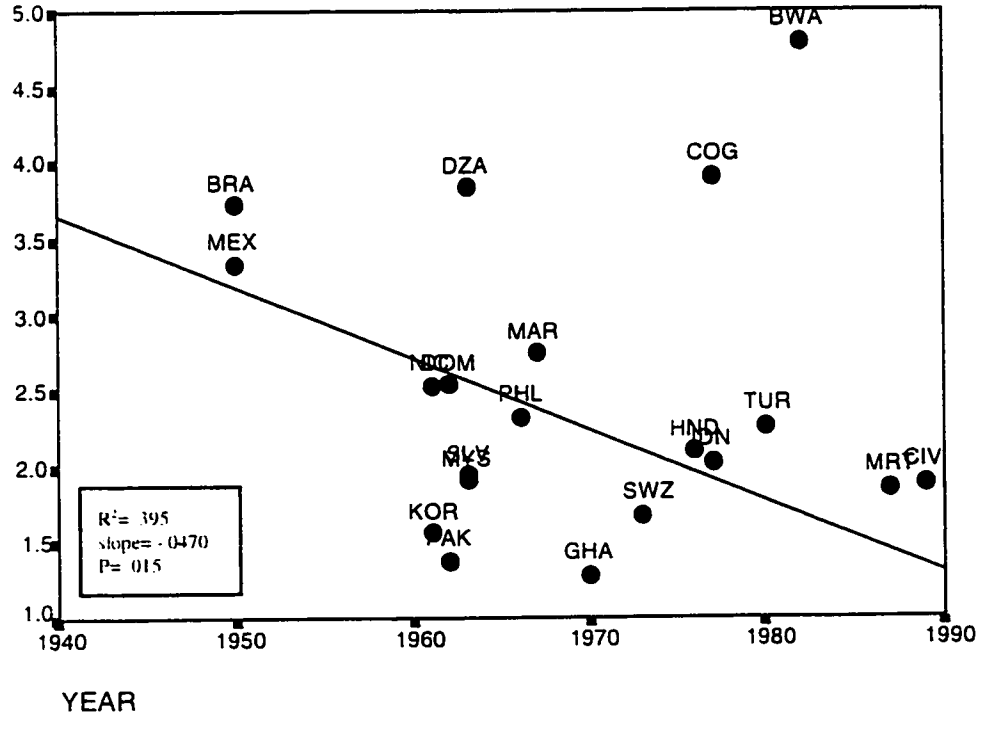
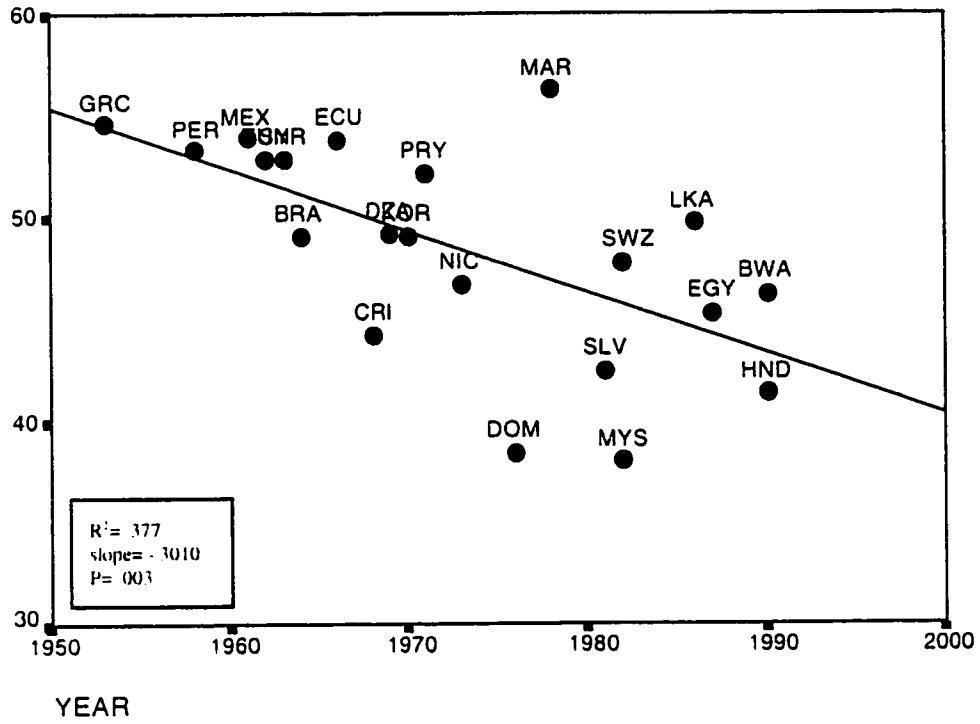


Figure 6-14 Shift in Agriculture Labour Force Share over Time: IND=20%



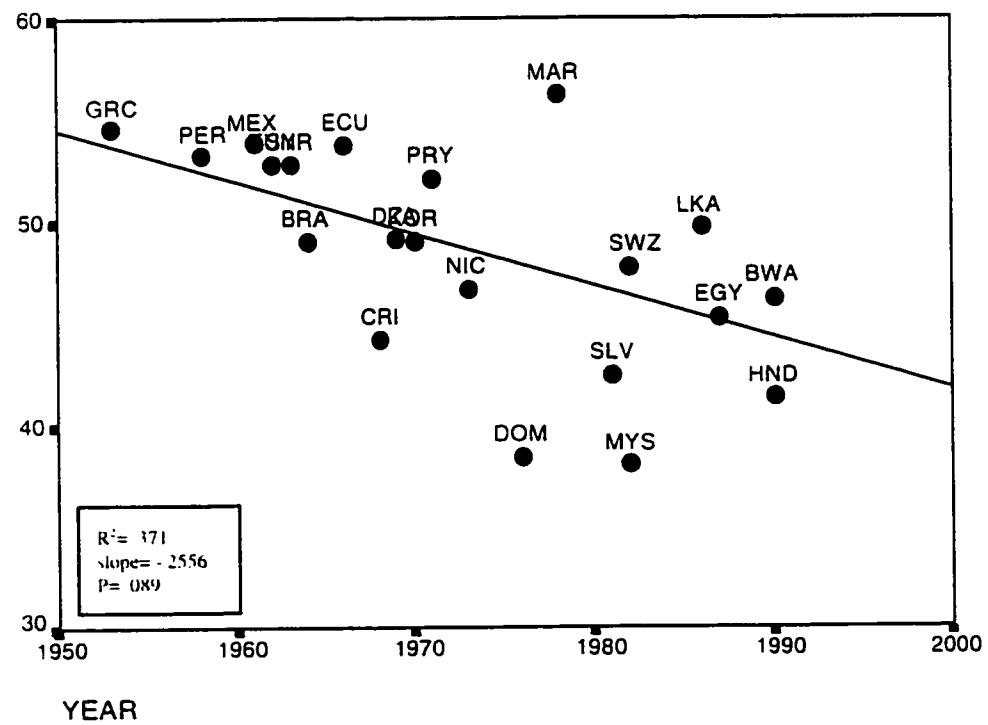
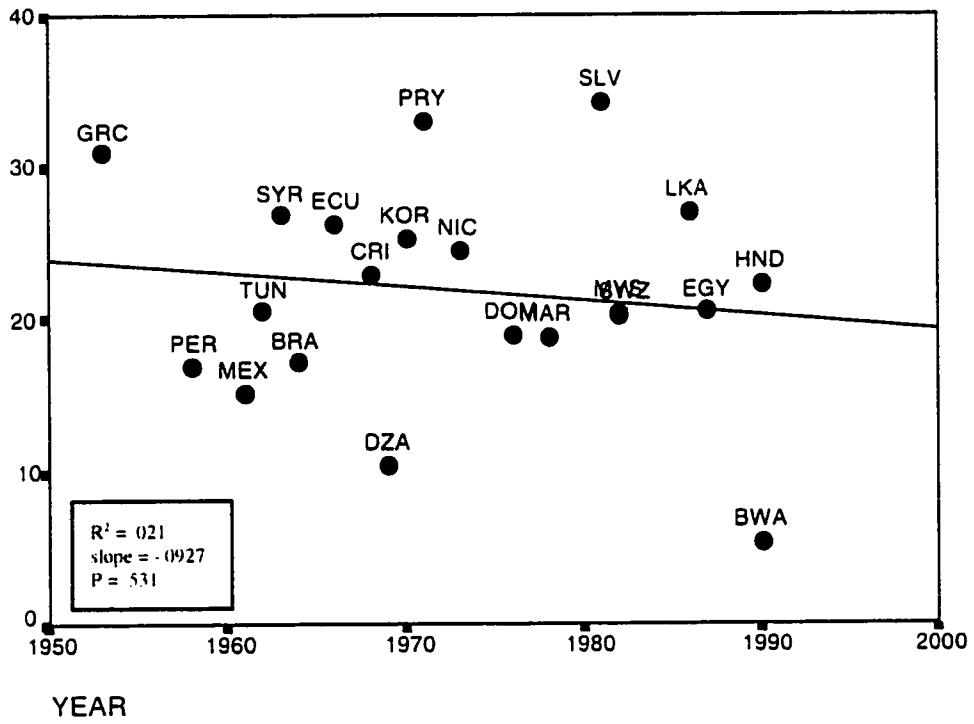


Figure 6-15 Shift in Agricultural GDP Share over Time: IND=20%



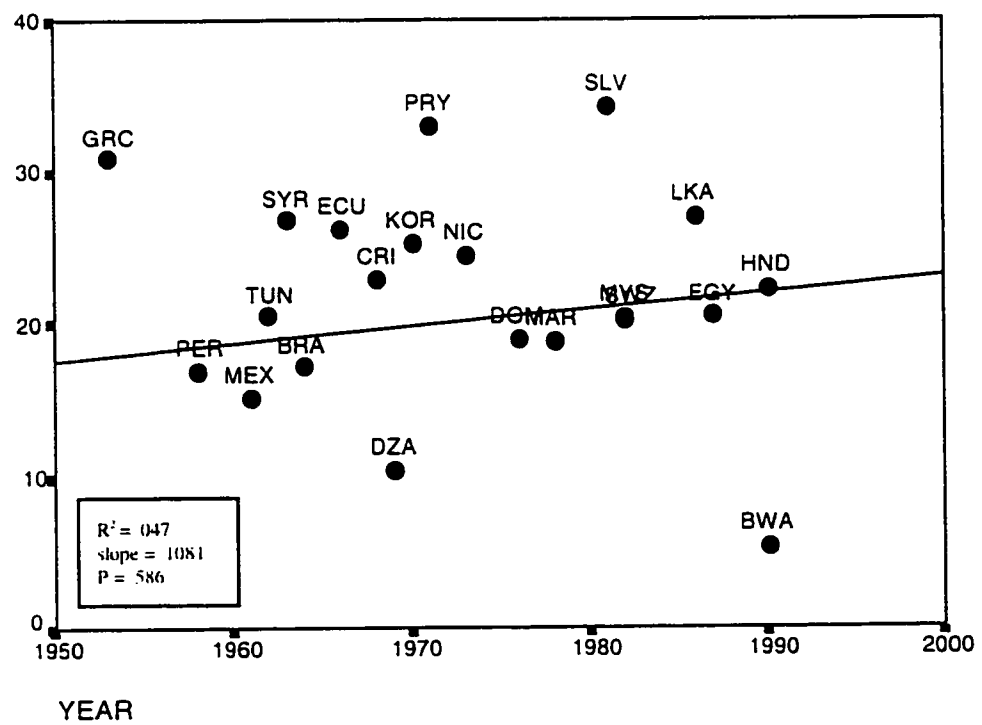
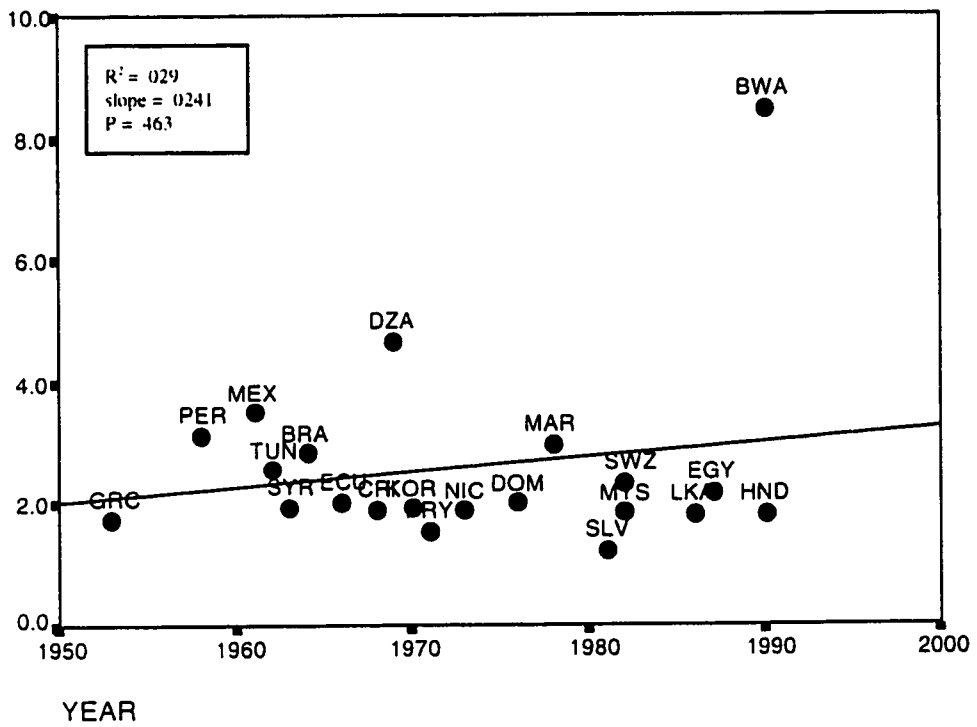


Figure 6-16 Shift in Agricultural LF:GDP Ratio over Time: IND=20%



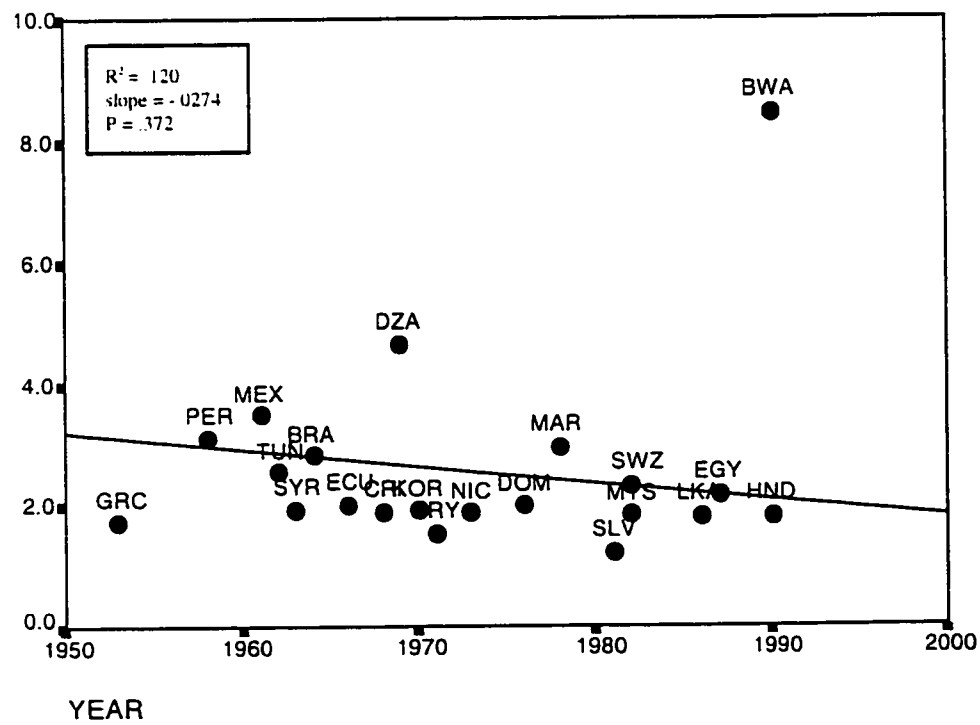
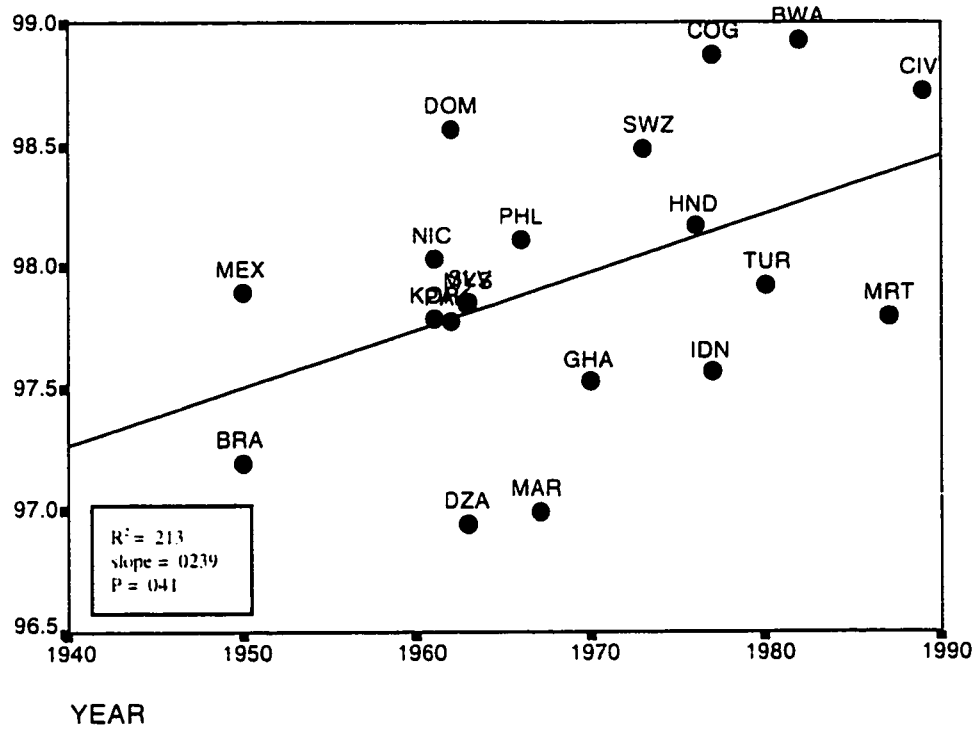


Figure 6-17 Shift in Labour Force Participation for Males Age 35-39: AG=60%



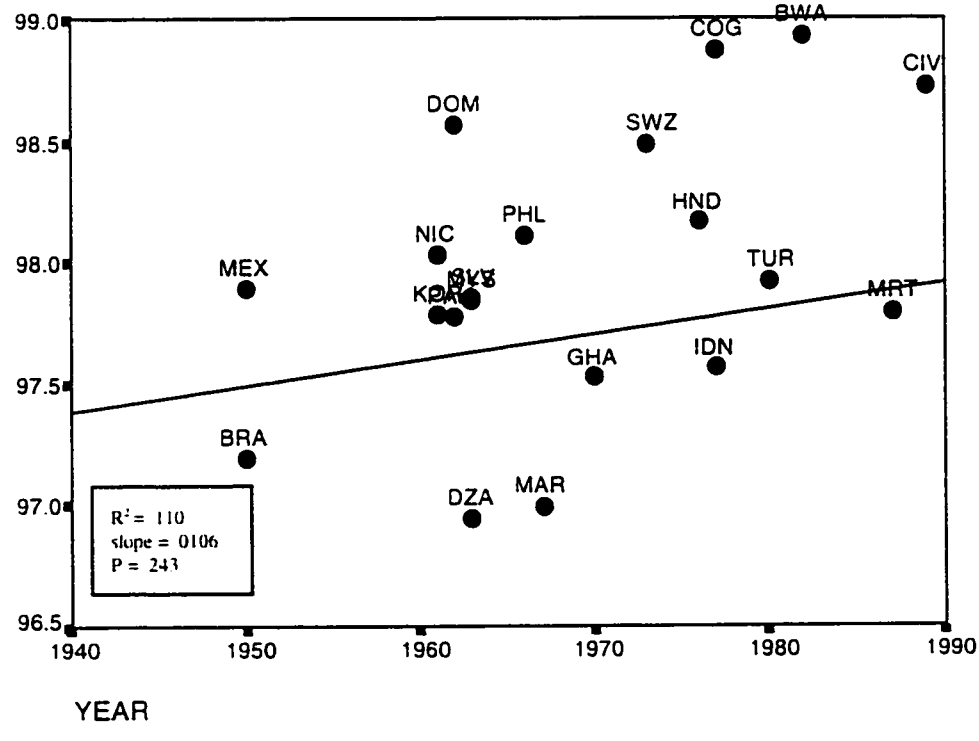
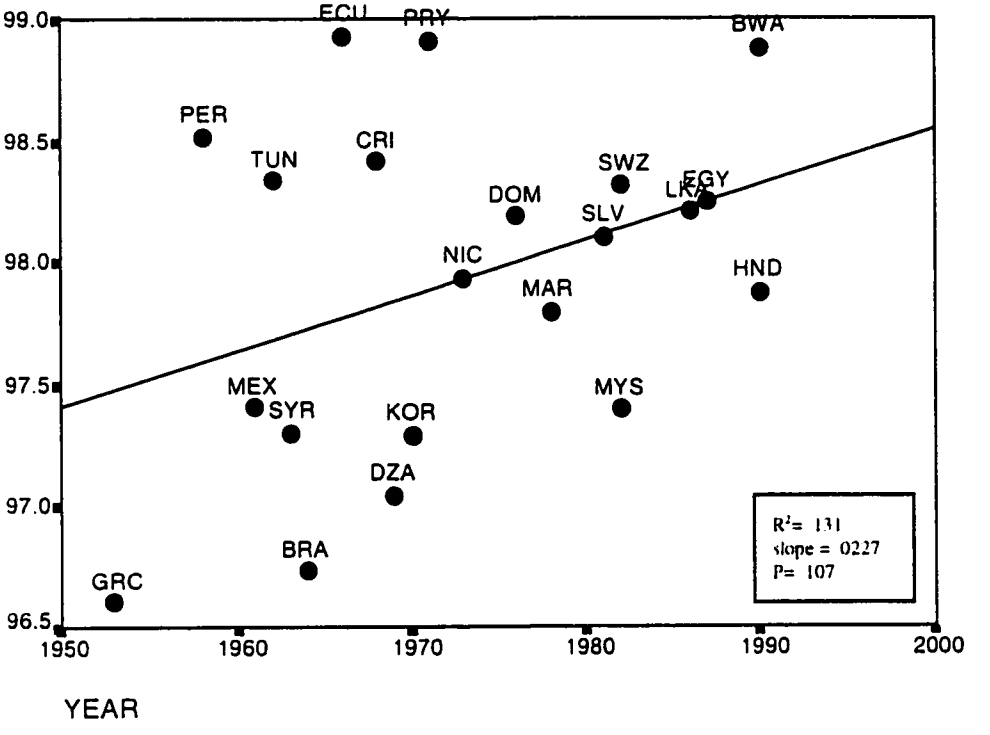


Figure 6-18 Shift in Labour Force Participation for Males Age 35-39: IND=20%



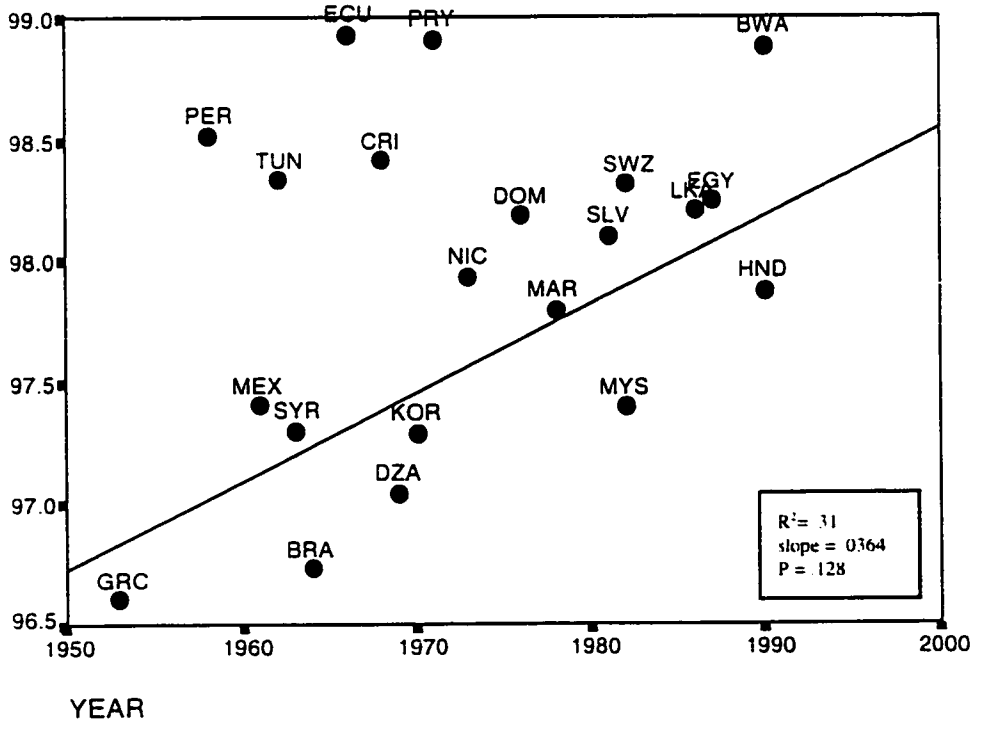


Table 6-2 Changes in Labour Force Participation from 1950 to 1990, by Country Groups

	Percentage Participation of Males Aged 35 to 39					
	1950	1960	1970	1980	1990	Change
All Countries	97.65	97.63	97.76	97.68	97.23	-0.42
Industrialised Countries (by 1950)	98.11	98	97.7	97.2	95.66	-2.45
Other Industrialised Countries (by 1950)	97.88	97.69	97.84	97.91	97.3	-0.58
Newly Industrialised (by 1960)	97.27	97.44	97.74	98.54	97.15	-0.12
Newly Industrialised (by 1970)	97.88	97.16	97.48	97.75	97.29	-0.59
Newly Industrialised (by 1980)	98.11	97.78	97.87	97.48	97.37	-0.74
Newly Industrialised (by 1990)	96.67	97.15	97.54	98.3	97.78	1.11
Semi-Industrialised Countries I	97.46	97.34	97.38	97.12	96.69	-0.77
Semi Industrialised Countries II	98.08	98.09	98.22	98.18	98.08	0
Rapidly Industrialising Countries	98.18	98.2	98.14	98.54	98.68	0.5

at the benchmarks confirms the overall hypothesis. At later stages of industrialisation, labour force participation for males age 35-39 shows a tendency to be lower than it was in the OICs. For early stages of industrialisation, labour force participation in this groups has risen over time. This further confirms that late structural transformation of the labour force has an 'accelerated' beginning.

B. Manufacturing Employment Peak

This benchmark captures a different set of countries, covers a larger sample, and reveals notably different patterns. Tables 6-3 and 6-4 summarise regression slopes and significance for indicators, and variations in the magnitude of change between IND=30% and the benchmark. It also distinguishes between two sub-groups: OICs and all other countries (NICs and two SICs). Two factors influence changes from the first two benchmarks. First, 30% of the sample are OICs. These countries industrialised largely during the 1800s, with different world relations, different levels of international competition, and different technology systems. The trend for all cases sometimes masks a statistically significant difference between the OICs and other countries. In particular, the positive relationship between industrial labour force share and GDP per capita, is not present for both groups. Second, the overall sample size comprises 45 countries, compared to 27 countries (in total) between the first two benchmarks. Other patterns and variance can therefore become visible.

Three general differences stand out at the MF PEAK. First, while patterns for industrial change are similar to those observed at other benchmarks, service and agricultural patterns differ. Second, a downward trend in labour force participation for males age 35-39 is observed, though the probability of error is between 5% and 10%. Third, a

Table 6-3 Slope Values for Indicators at the Manufacturing Employment Peak

Key:

Bold text**	R^2 highly significant; 1% probability
Bold text	R^2 significant; 5% probability
Regular (t)	R^2 has 6-10% probability; slope notable
Regular	R^2 has 11-35% probability; slope notable
--	Probability of R^2 greater than 35%

Indicator	Countries, not Weighted			Weighted by Population		
	All N = 45	OICs N = 17	Others N = 28	All	OICs	NICs
GDP per capita	--	**+227.692****	--	-57.328	**+152.016****	-195.81
Time from IND=30% to benchmark	**-1.7553****	--	--	**-1.9245****	--	-0.9464
Industrial Labour force	**-0.2309***	--	--	**-0.295***	+0.2956	--
Industrial GDP share	--	--	--	+0.1337	+0.3440(t)	--
Industrial Labour Force Share to GDP share ratio	-0.0034	-0.0058	+0.0104	**-0.0121****	**-0.0078***	--
Service Labour force	--	--	--	**-0.3098****	-0.1778	-0.3915
Service GDP share	--	--	--	**-0.2259***	-0.2459	--
Service Labour Force Share to GDP share ratio	--	--	--	--	--	--
Agriculture Labour Force	**+0.2895***	--	--	**+0.5928****	--	+0.6340
Agricultural GDP share	--	-0.1714	+0.1972	+0.1000	-0.1236	+0.3599
Agricultural Labour Force Share to GDP share ratio	+0.0330	**+0.0332***	-0.0547	**+0.0472****	**+0.0385****	--
	--	--	-0.0425	--	+0.0509	--
Labour Force Participation (Males ages 35-39)	-0.0208	--	--	-0.0197(t)	--	-0.0752(t)

Table 6-4 Slope Values for the Magnitude of Change in Indicators at the Manufacturing Employment Peak

Key:

Bold text**	R^2 highly significant; 1% probability
Bold text	R^2 significant; 5% probability
Regular (t)	R^2 has 6-10% probability; slope notable
Regular	R^2 has 11-35% probability; slope notable
--	Probability of R^2 greater than 35%

Net change from IND=30% for Indicators	Countries not Weighted			Weighted by Population		
	All N=31	OICs N=17	NICs N=14	All	OICs	NICs
GDP per capita	--	**+259.711****	--	--	**+209.061****	--
Industrial Labour force	-0.1179	--	--	--	+0.2956	--
Industrial GDP share	--	--	--	--	--	--
Industrial Labour Force Share to GDP share ratio	--	--	--	**+0.0112***	+0.0149	--
Service Labour force	-0.3655(t)	--	--	--	**+0.7558***	--
Service GDP share	--	+0.6703(t)	--	--	**+1.0442****	--
Service Labour Force Share to GDP share ratio	--	--	+0.0120	--	--	--
Agricultural Labour Force Share	+0.2676(t)	--	--	+0.2220	-0.402	--
Agricultural GDP share	--	-0.7144(t)	--	--	**-0.8799***	--
Agricultural Labour Force Share to GDP share ratio	--	--	-0.0425	--	+0.0509	--
Labour Force Participation (Males 35-39)	--	one case	--	-		

rise in overall GDP per capita at the MF PEAK is notable for OICs, but not for other countries. Taken together, these three observations result in two new regressions being tested in section C: GDP per capita versus industrial labour force share; and the industrial LF:GDP ratio versus industrial labour force share.

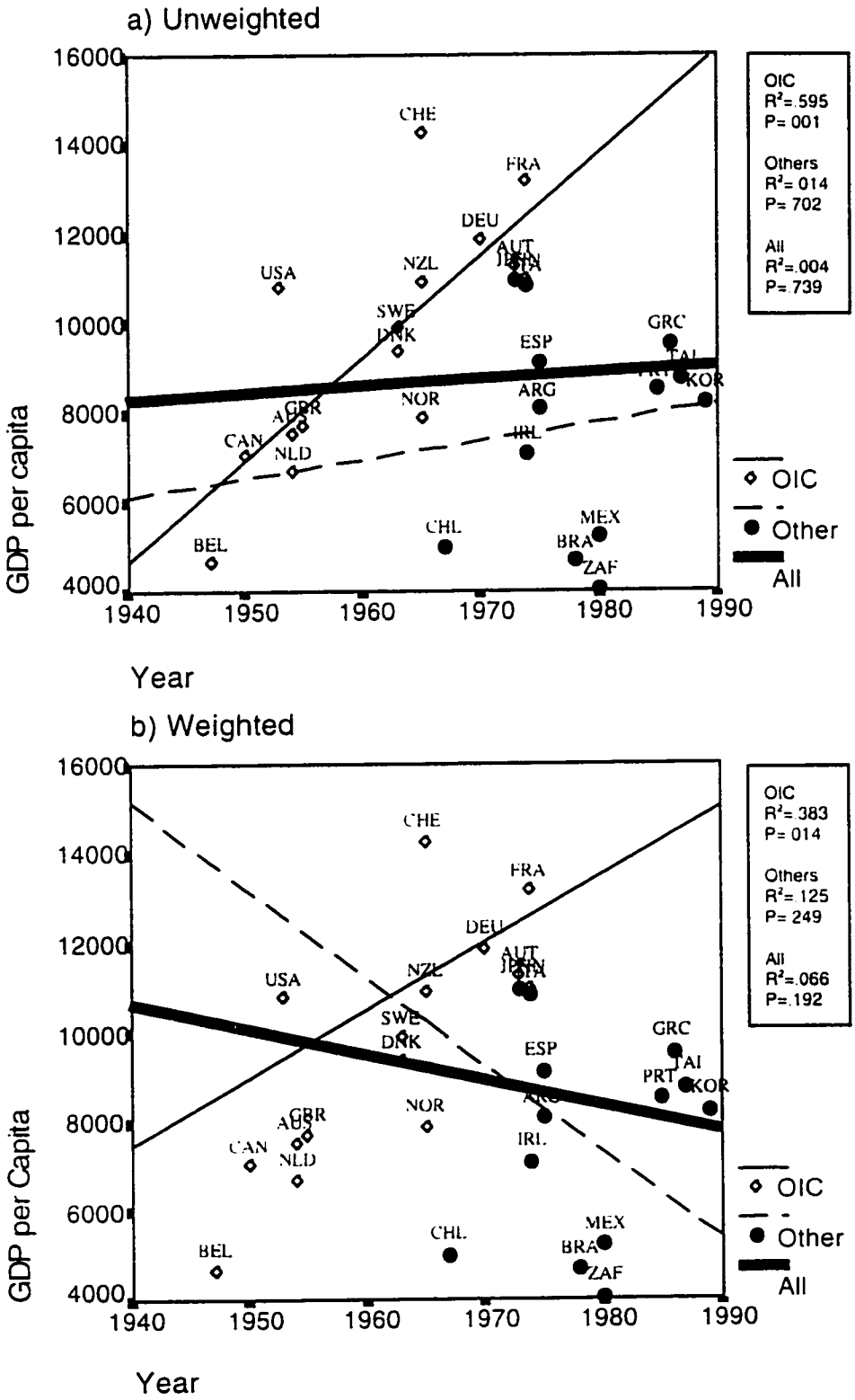
1. GDP per Capita

		Results		
Variable	**Hypothesised Change**	**All**	**OIC**	**Others**
Value of GDP per capita at peak*	Varies	-	✓	-
Magnitude of change	Varies	-	✓	-

Along with industrial sector changes, GDP per capita show the most easily identified change over time (figure 6-19). There is, in fact, no pattern for the total sample for either weighted or unweighted data. At the level of the whole sample, the null hypothesis cannot be rejected. However, OICs show a highly significant shift towards higher GDP per capita over time. Other countries, on the other hand, show a slight tendency towards a lower GDP per capita for the weighted test, although with a 25% probability of error. Here, the impact of Brazil and Mexico on the total sample reverses the trend observed for the OICs. Among the OICs, on the other hand, the population weights for Germany and the United States lower the strength of the relationship, since both have fairly similar GDP values separated by 20 years.

While the negative trend is not significant for non-OICs, the change in sign reflects a high degree of change in the industry-income relationship. For OICs there was a strong, positive relationship between higher GDP per capita and time. This disappears for NICs and SICs in the mid-1970s. In figure 6-21, the maximum labour force share is seen to have no relationship with time, while the total sample has a declining share overtime. This correlation is particularly interesting, because the OIC data do not support

Figure 6-19 Shift in GDP per Capita at the Manufacturing Employment Peak



the hypothesis that industrial employment is correlated with high national income, yet the total sample does.

2. Industry

Variable	Hypothesised Change	Results All	OIC	Others
# Years the industrial labour force > 30%*	Falls	✓	-	-
GDP share*	Rises			
Labour Force to GDP ratio*	Falls	✓	-	-
Peak industrial labour force share	Falls	✓	-	-
Magnitude of GDP change from IND=30%	Varies			
Magnitude of change in LF:GDP	Varies	-	✓	-

Declining shares for the industrial labour force over time remain the most consistent pattern between the three benchmarks. Figure 6-20 shows a significant reduction in the number of years the industrial force is above 30% (an estimate of the duration of 'industrial society'). Figure 6-21 shows that the labour force peak declines over time. Note that the United Kingdom, Belgium, Switzerland, and Germany all reached 30% before the time-series begin, so their values could be larger than those depicted. What is of importance, is that a significant proportion of the OIC population experienced several generations with industrial labour activity at or above one third of the labour force, and strongly associated with GDP growth. As noted above, their experience seems to have been the exception, not the rule of industrialisation.

Although industrial labour force share shows a decline over time for both weighted and unweighted data, the decline is more visible over the entire sample than within either the OIC or non-OIC subgroups. In fact, for OICs, the trend even leans toward the positive in the weighted data, reflecting the differences between the US and Germany. A more pertinent observation, with respect to the original hypothesis, is that

Figure 6-20 Rate of Structural Transformation: Number of Years between Industrial Labour Force Share = 30% and the MF PEAK

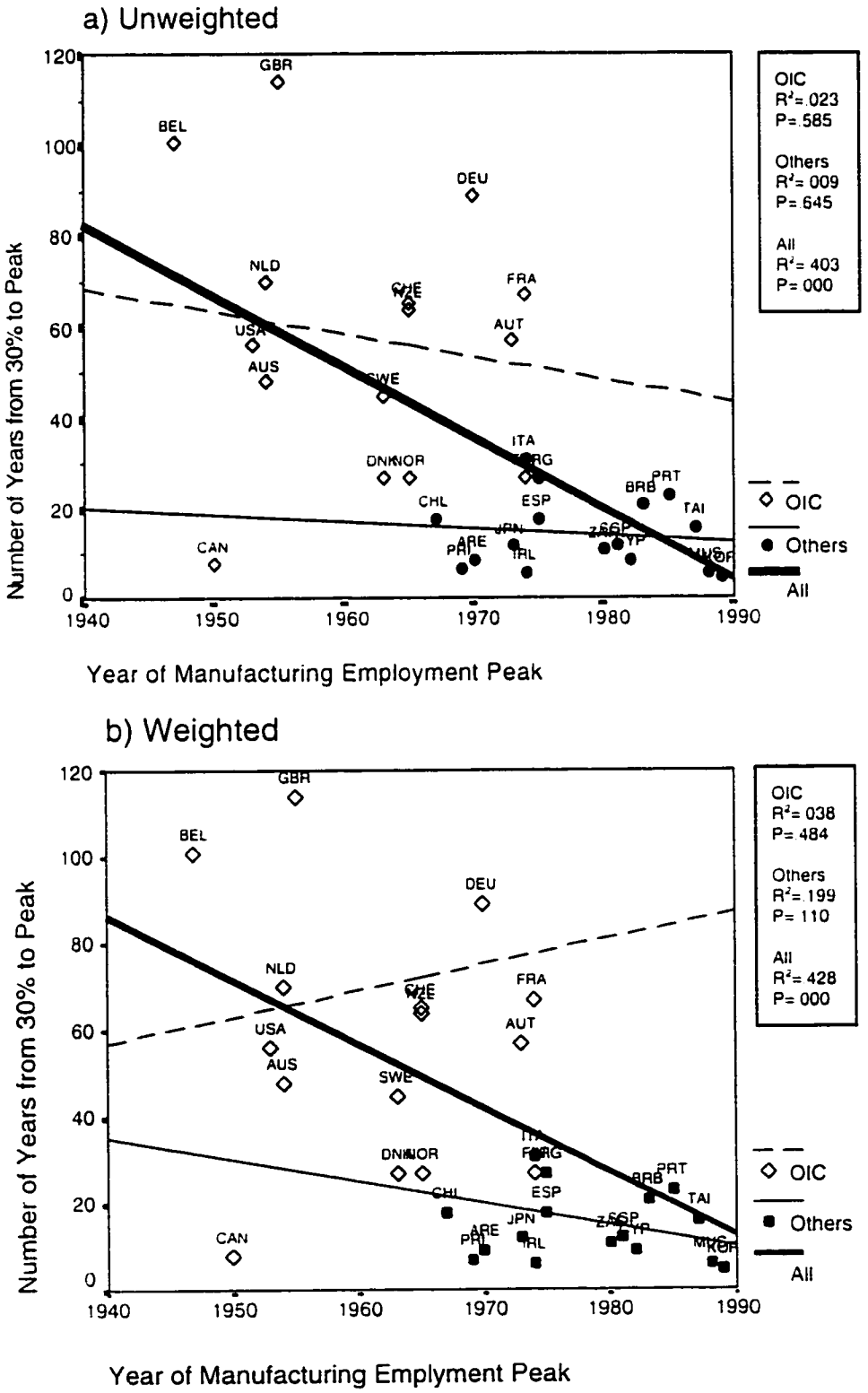


Figure 6-21 Shift in Industrial Labour Force Share over Time at the Manufacturing Employment Peak

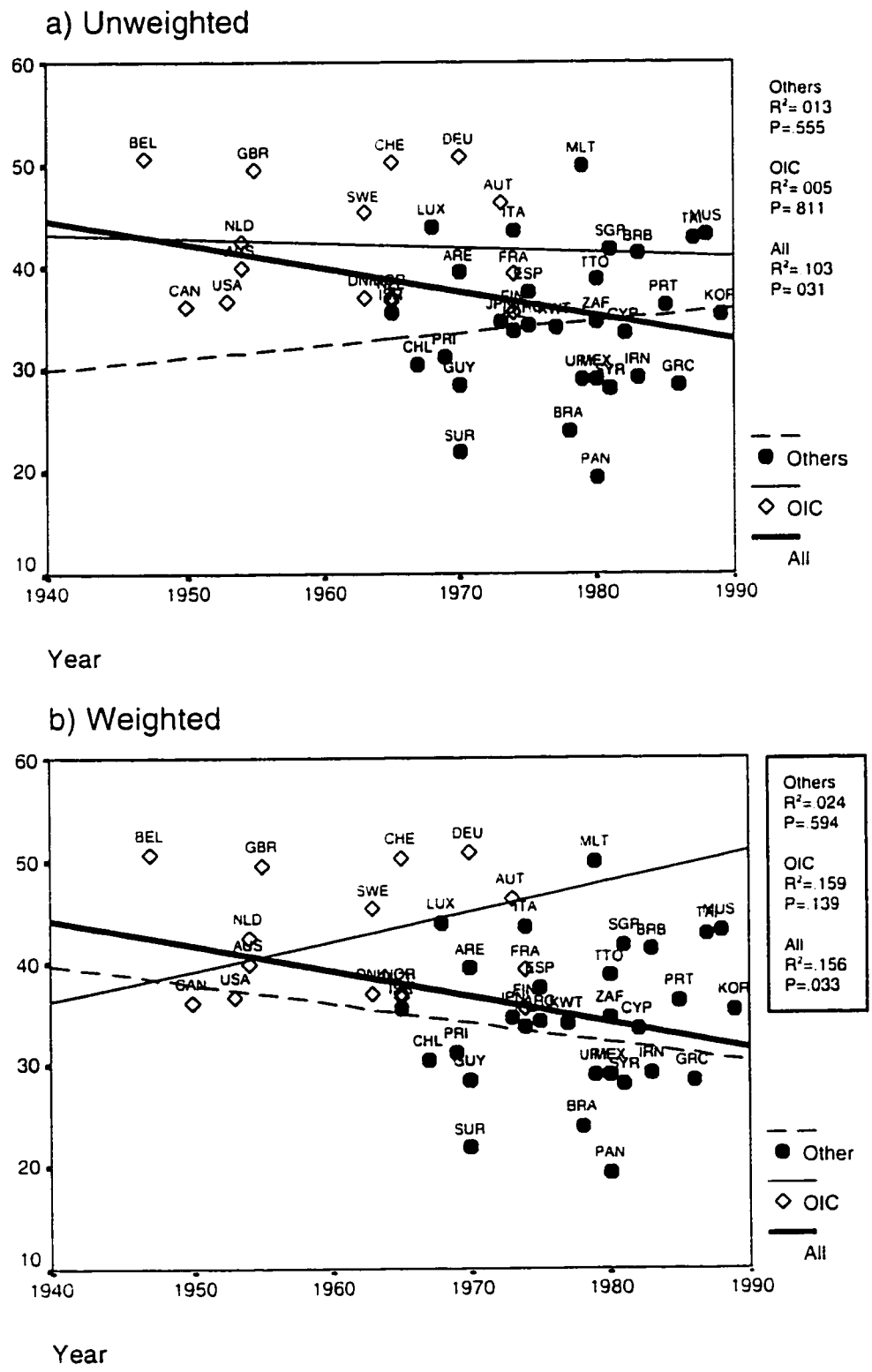


Figure 6-22 Shift in Industrial GDP Share over Time at the Manufacturing Employment Peak

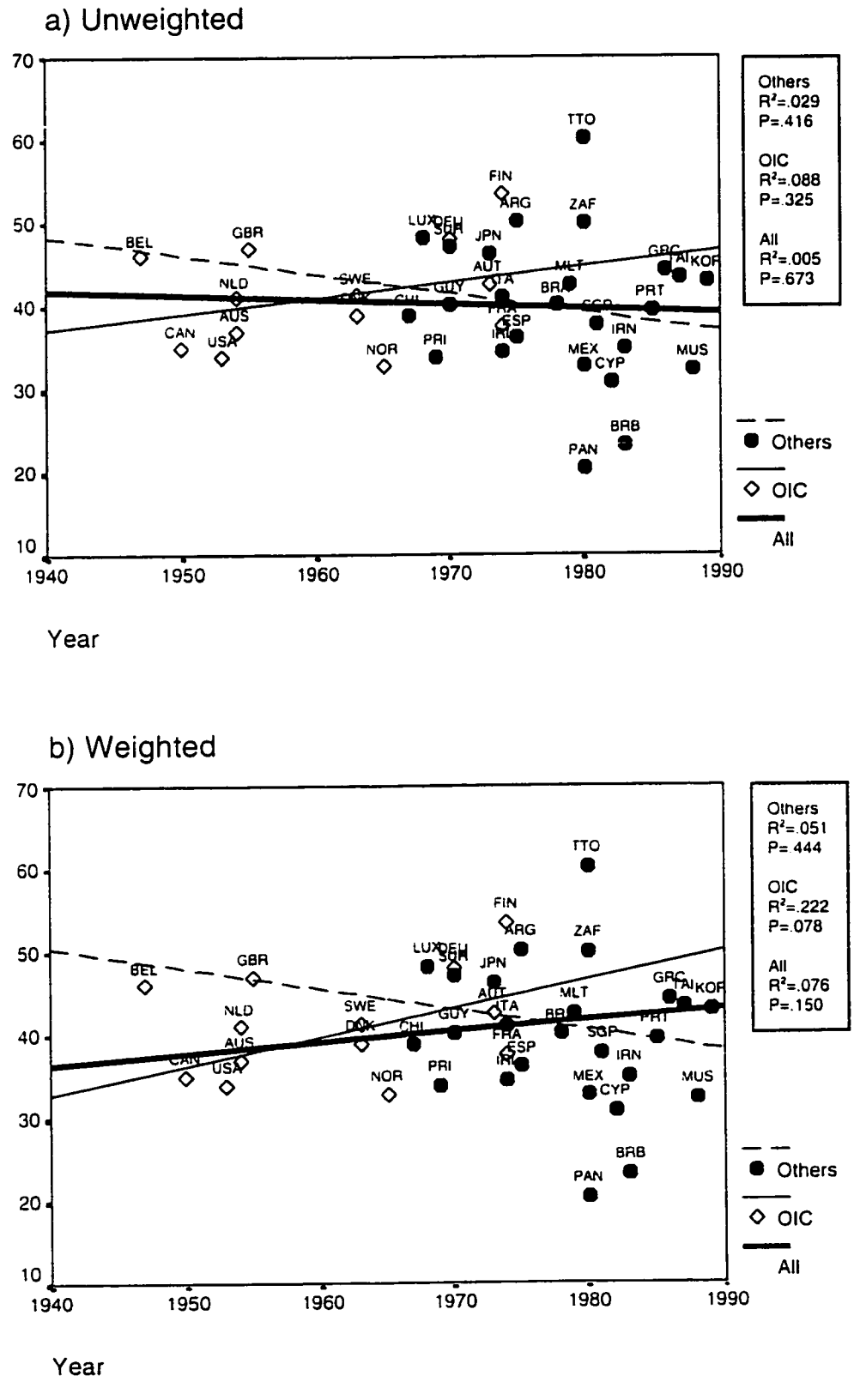
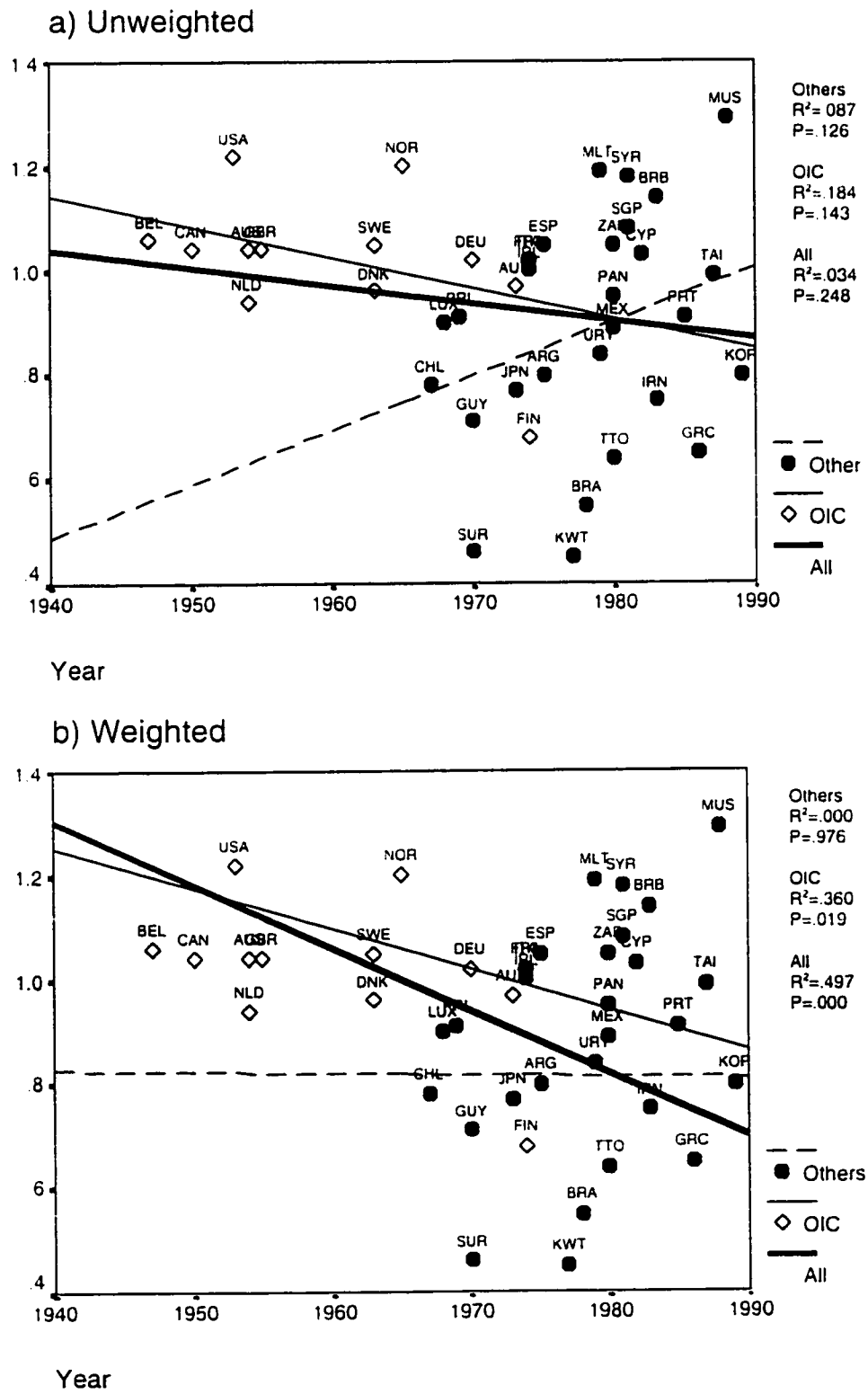


Figure 6-23 Shift in Industrial LF:GDP Ratio over Time at the Manufacturing Employment Peak



little change in maximum industrial labour force size can be seen over time for the OICs. They benefit from continual industrial growth (worldwide), and rising GDP per capita, from the period immediately after World War II until the mid-1970s.

No significant pattern emerges for the industrial GDP share, so the null hypothesis cannot be rejected. Changes in the industrial LF:GDP ratio emerge, however. The ratio declines significantly for weighted data for both the total sample and for the OICs. In particular, the high labour-intensity in the US contrasts with lower labour-intensity in most of western Europe. Not only did European OICs have large industrial labour forces at the MF PEAK, workers were better paid. This indicates the likely presence of more capital-intensive production, with a more skilled industrial labour force. It may also depict a social higher value placed on industrial activity versus other sectoral activity. Both explanations would reflect the interpretations of the regulation school, in which social relations supported industry.

Other countries, by contrast, show no trend in LF:GDP for weighted data, and even a slight positive trend (not significant) for unweighted data. Data distributions in figure 6-23 indicate that the positive trend may be accidental, however. Ratios for industrial LF:GDP in the NICs and SICs are clearly quite variable at the MF PEAK, ranging from below 0.6 to above about 1.3. The relative differences in trends between OICs and other countries at this benchmark points to an apparent split within the non-OICs. Some show evidence of higher labour intensity, and some higher capital-intensity. Korea, Greece, Uruguay, and Mexico appear to have had greater capital-intensity at their peaks, compared to Mauritius, Spain, Cyprus, and Singapore. An apparent reversal in trend between non-OICs and OICs for the LF:GDP ratio disappears when the population

weights of Cyprus, Singapore, Mauritius, and Malta are factored in relative to Mexico, Korea, and Brazil. This reversal for non-OICs raises questions about the potential of labour-intensive manufacturing as an 'engine of growth'. With respect to comparative social benefits for industrial labour, labour-intensive manufacturing activity has affected a relatively small proportion of the world's labour force. Korea, may have famously exploited labour-intensive activity to achieve its current industrial status, but apparently it rapidly replaced labour with capital-intensive activity, and thus lowered benefits to the total industrial labour force (Park, 1994; Clark, 1995).

3. Services

Variable	Hypothesised Change	Results All	OIC	Others
Labour force value at MF PEAK*	Rises	✗	-	-
GDP share at MF PEAK*	Falls	-	-	-
Labour Force to GDP ratio at Peak*	Rises	-	-	-
Magnitude of labour force share change	Varies	-	✓	-
Magnitude of change from IND-=30%	Varies	-	✓	-
Change in LF:GDP ratio	Varies	-	-	-

Service labour force actually shows a tendency to decrease over time at the MF PEAK, but which only reaches significance for weighted data. No significant trends emerge for unweighted data. NIC shares are more variable, as they were for industry. Weighted GDP share shows a tendency to decrease, but has a smaller slope value than the labour force share decline (table 6-3). That is to say, it decreases at a lower rate. There are no significant trends for the service LF:GDP ratio.

A closer examination of figures 6-24 to 6-26, and the previous discussion of OIC population sizes helps to explain the unexpected trend. Amongst the OICs, the most populous countries are the US and Germany, which have radically different labour force structures. The service-oriented US and industry-oriented Germany affect the overall

Figure 6-24 Shift in Service Labour Force Share over Time at the Manufacturing Employment Peak

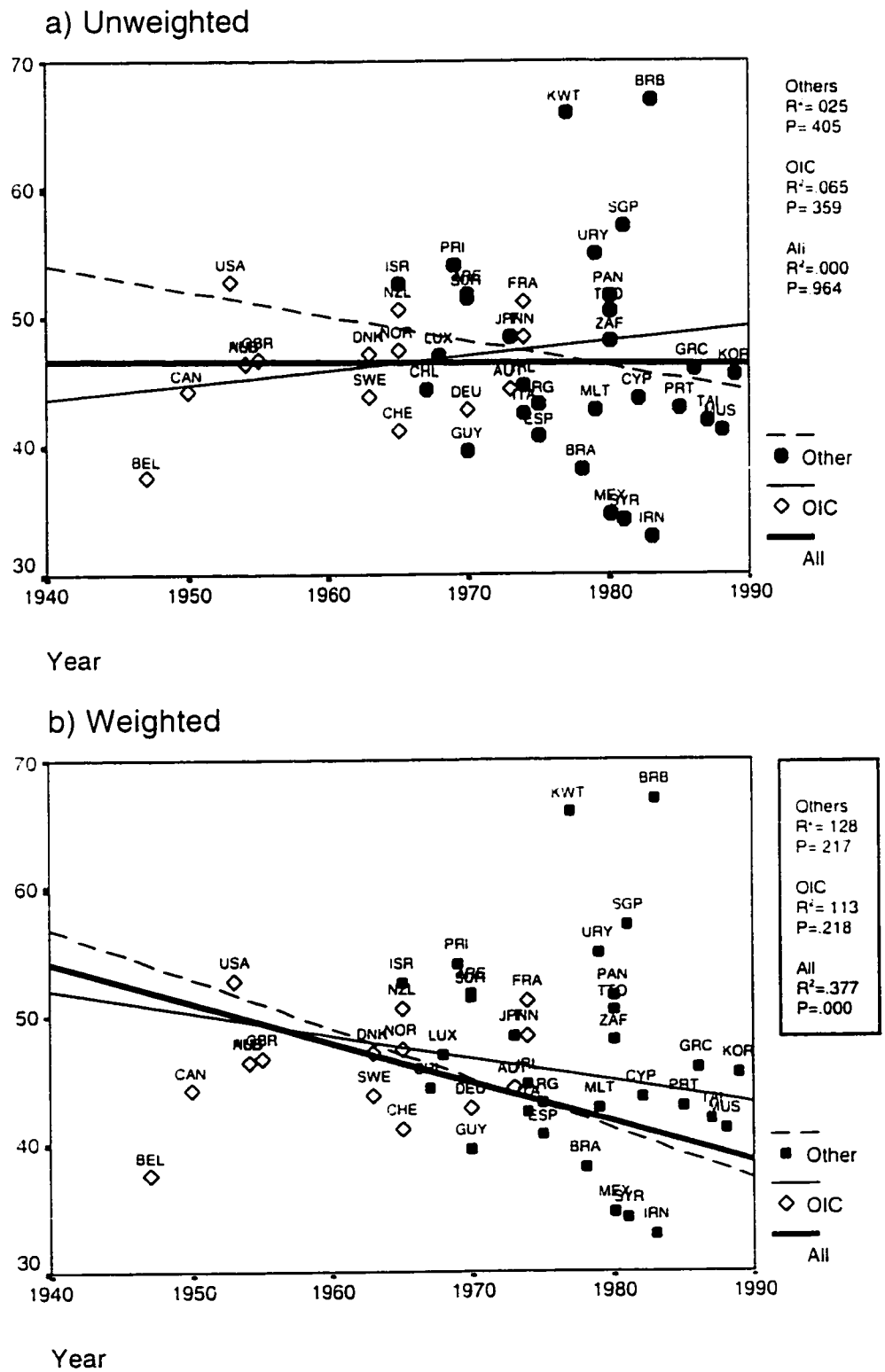


Figure 6-25 Shift in Service GDP Share over Time at the Manufacturing Employment Peak

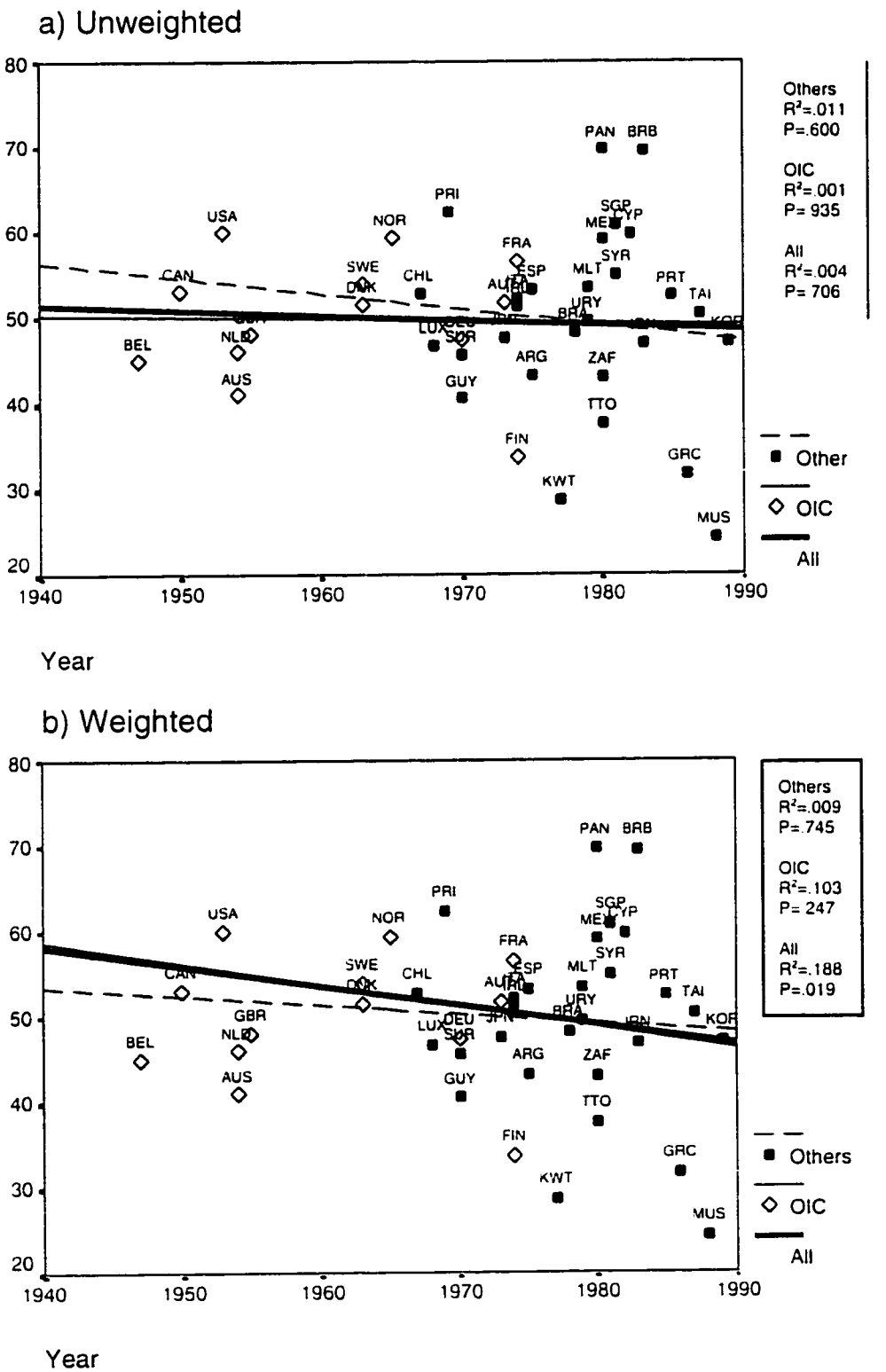
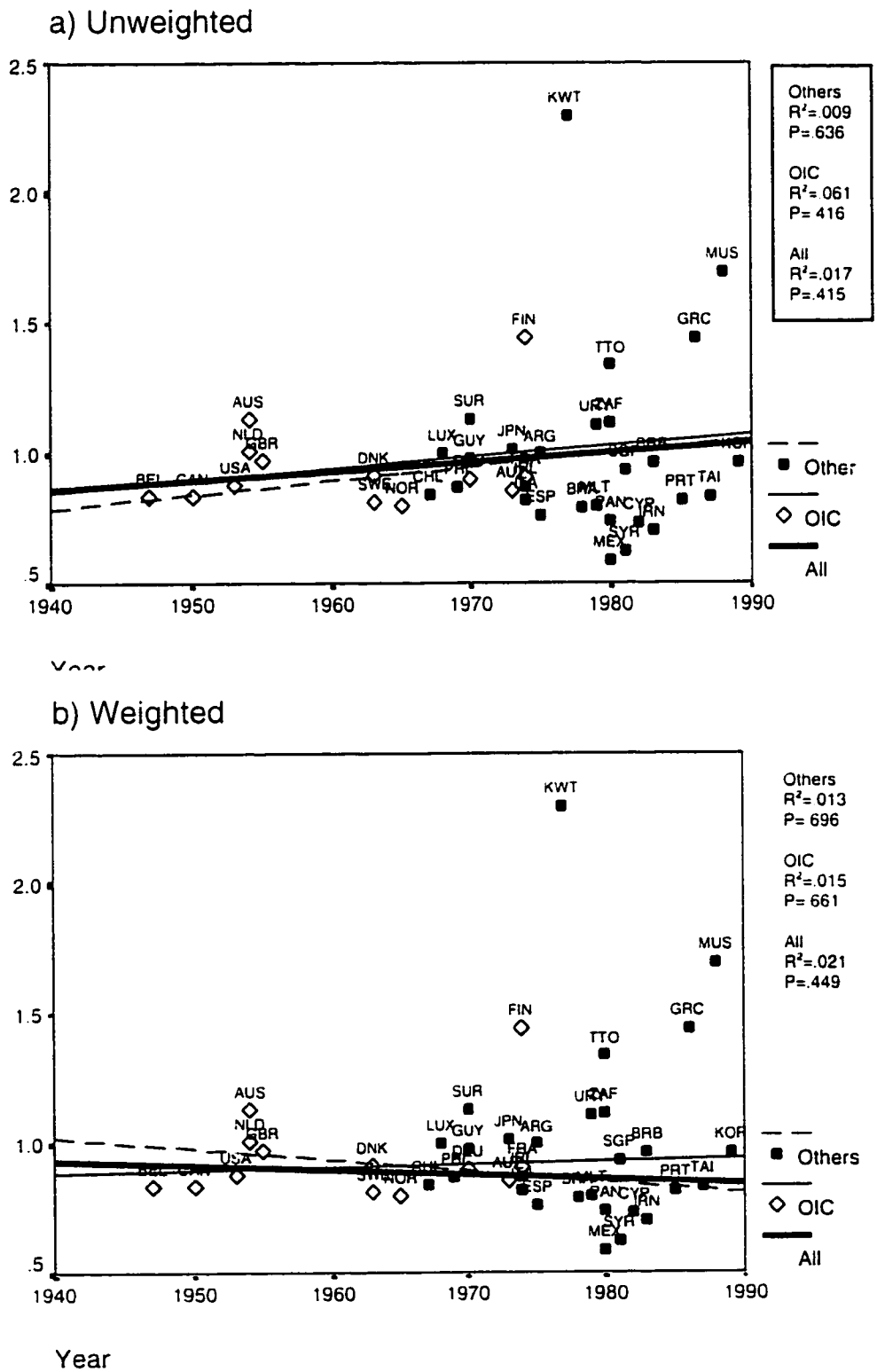


Figure 6-26 Shift in the Service LF:GDP Ratio over Time at the Manufacturing Employment Peak



patterns for weighted OIC data. Most OICs actually show no overall pattern. After examination of agricultural sector change in the next section, it can be seen that significant changes in agricultural labour force and GDP shares may also affect this pattern.

4. Agriculture

Variable	Hypothesised Change	Results All	OIC	Others
Peak industrial labour force value*	Falls	✗	-	-
GDP at labour force peak*	Falls	-	-	-
Labour Force to GDP ratio at Peak*	Falls	✗	✗	-
Magnitude of labour force share change	Varies		-	--
Magnitude of change from IND-=30%	Varies	-	-	✓
Change in industrial labour LF:GDP ratio	Varies	-	-	-

For NICs and SICs examined at the first two benchmarks, the size of the agricultural labour force tended to decline over time, indicating an acceleration in the movement of labour out of agriculture. For countries at the later MF PEAK benchmark, however, agricultural labour forces are clearly larger over time (figure 6-27). This, in fact, does agree with the shift in sectoral shares observed for weighted data in chapter 4. When these results are interpreted along with those that emerged for services, the agricultural sector would appear to be acting as an employer of last resort for later industrialisers, at least at this stage in the transformation process. That is to say, there is a relative decline in industrial labour force share, and no clear increase in service labour force share. As with the industrial labour force data, there is no significant trend for agricultural labour force share in the sub-groups. The same tendency to increasing variance is visible.

Weighted labour force data for the NICs and SICs show a slight positive trend with a probability of only 28%, and with high variation. Brazil, Mexico, Syria and Iran emerge as highly agricultural countries at their MF PEAK for example, but amongst these four, Brazil and Iran have a more ambivalent 'industrialised' status, due to their recent

Figure 6-27 Shift in Agricultural Labour Force Share over Time at the Manufacturing Employment Peak

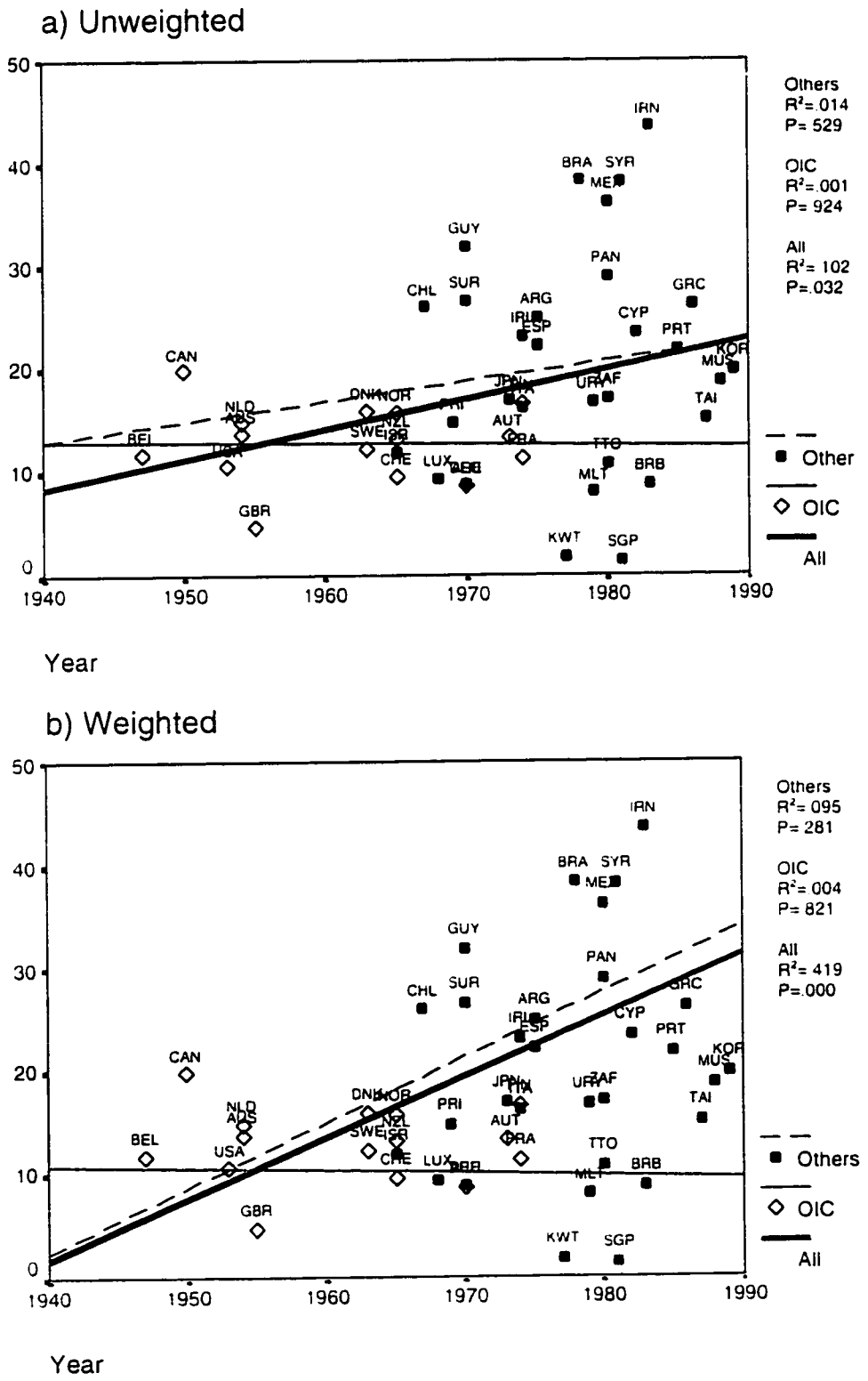


Figure 6-28 Shift in Agricultural GDP Share over Time at the Manufacturing Employment Peak

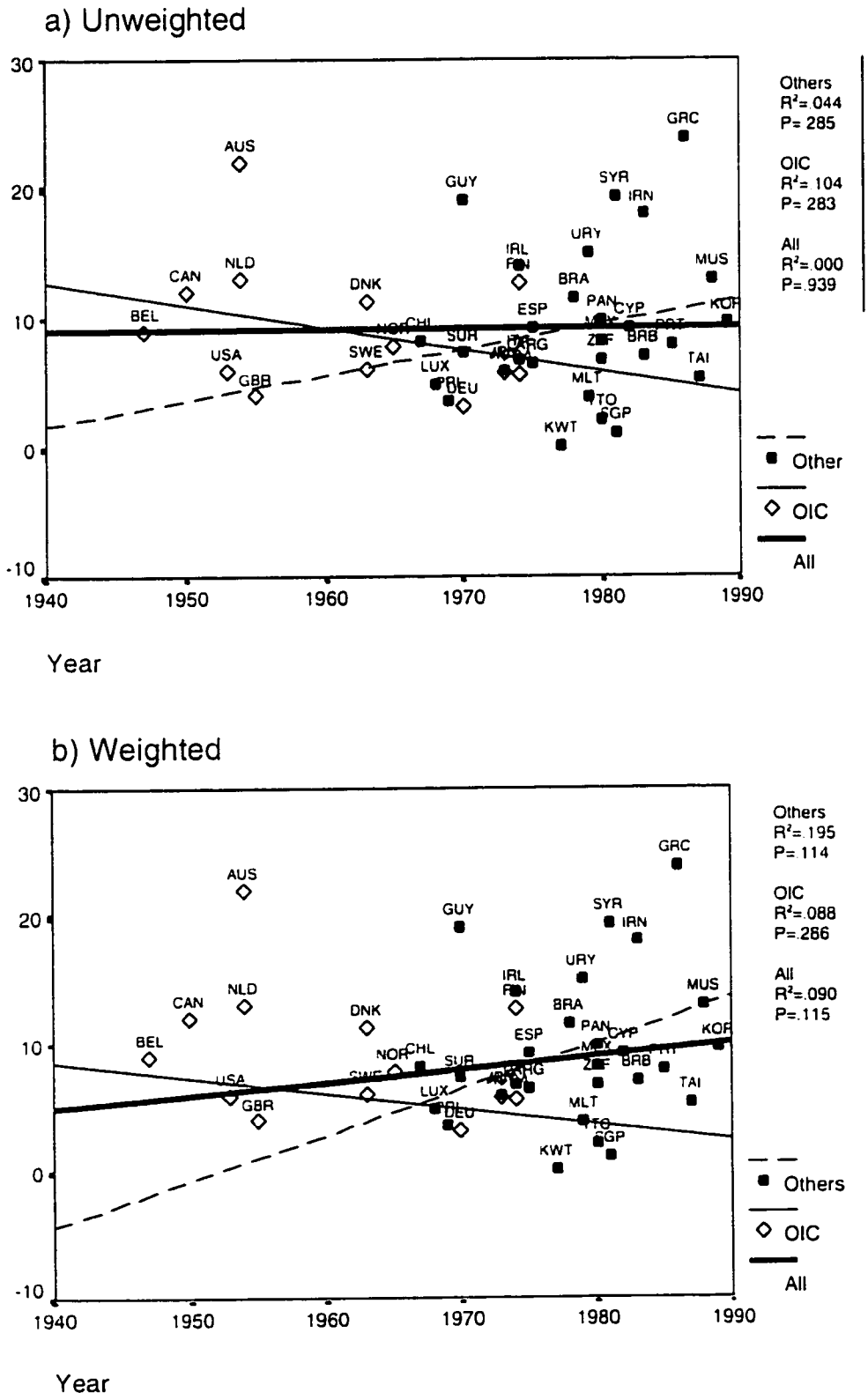
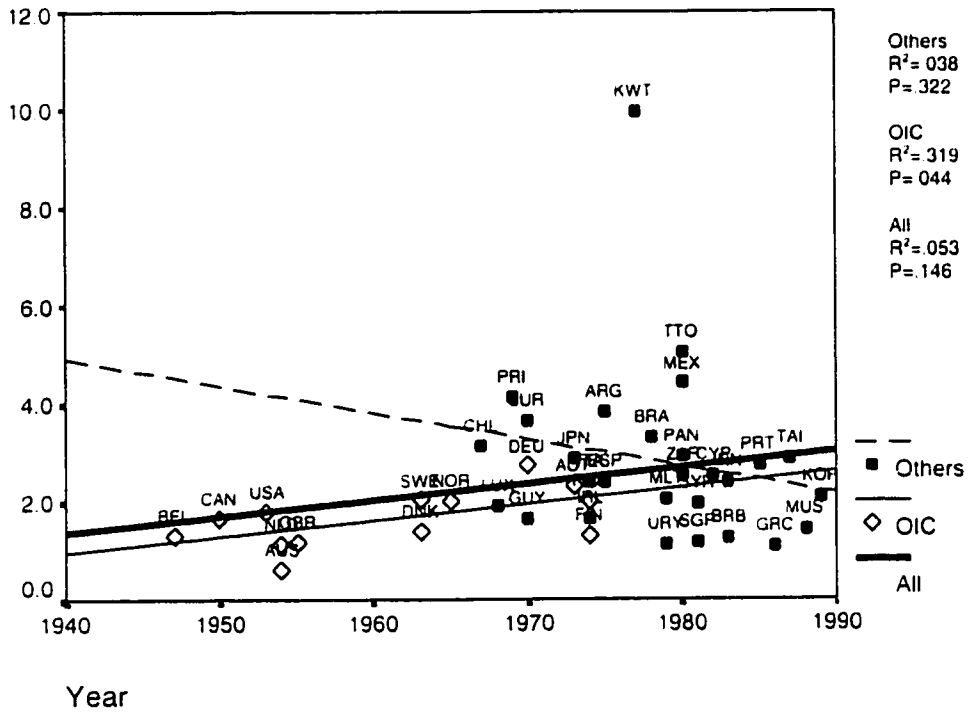
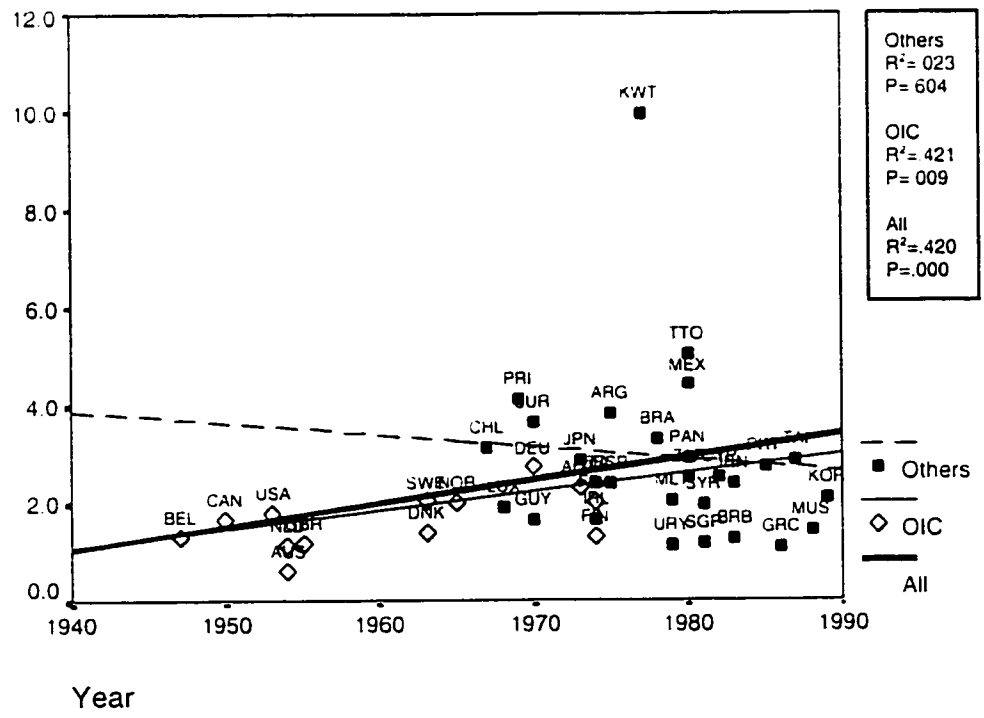


Figure 6-29 Shift in the Agricultural LF:GDP Ratio over Time at the Manufacturing Employment Peak

a) Unweighted



b) Unweighted



political and economic volatility. However, less ambivalently post-industrial countries, such as Ireland, Korea, Portugal, Spain, and Greece, also show larger agricultural labour forces share the MF PEAK. The two lone countries with notably lower agricultural labour force share are Kuwait, and Singapore, which are highly urban. Other NICs countries with low labour force share are Trinidad and Tobago, Barbados, and Malta, which are islands, and have higher service activity. Trinidad and Tobago also has old refining.

Trends for agricultural GDP share are not significant. An interesting pattern, however, is that OIC shares tend to decline (probabilities of error = 28% and 29%), while non-OIC shares tend to rise (probabilities of 29% and 11%). Again, this variation between sub-groups, though not significant, does provide further support for a shift in the structural transformation process. Any tendency for the OIC's relative agricultural GDP share to decline over time was not matched by an equal movement of labour out of agriculture, however.

The LF:GDP ratio for OICs rises over time and is well over 1.0 (figure 6-29). The social position of OIC farmers is thus falling overall, at least as measured by labour force versus GDP share. Alternatively, this trend may reflect an artificial support of agricultural labour in OICs. It is not impossible that it reflects both, that is to say, subsidisation may be high, while the economic and social status of farming declines. Another, less common, interpretation would be that agricultural production is undervalued compared to its labour requirements. In summary, in the early OICs, the agricultural labour force share falls to lower levels at the MF PEAK than it does in later OICs and in SICs and NICs. Agricultural labour-intensity in later industrialisers, including late

peaking OICs, is higher.

Within non-OICs, no change can be confirmed for LF:GDP over time, though there is some sign of decline towards 1.0 within the NICs and LICs. On average, ratios tend to be higher than they were for OICs, but the time trend is not clear. Countries like Puerto Rico, Trinidad and Tobago, Brazil, Argentina, and Mexico have ratios which are higher than some later industrialisers such as Taiwan and Korea. Values are well above 1.0 for many OICs and non-OICs. By contrast, later LF:GDP values for both service and industry tend to be below 1.0 for many non-OICs. Values for OICs tend to be above 1.0 for industry and closer to 1.0 for services. Agriculture is still playing an important employment role in the NICs at peak manufacturing employment levels.

5. Total Labour Force Activity

Variable	Hypothesised Change	Results All	OIC	Others
Labour force at MF PEAK	Falls	trend	-	trend
Magnitude of change from IND=30%	Not null	-	-	

The expected decline in labour force activity is evident at the MF PEAK but does not reach significance. Trends are quite strong for weighted data, with a probability of error of under 10% for non-OICs. In particular, Portugal, Korea, and Greece have lower participation rates for males aged 35-39 in the latter 1980s (Appendix IV).

C. National Income, Labour Force to GDP Share Ratios and Industrial Labour Force

The most consistent pattern observed in the indicators examined was the decline in industrial labour force. Because such a clear break in several trends emerged between OICs and other countries at the MF PEAK, the relationships between the industrial labour force share versus GDP per capita, and labour force share versus industrial LF:GDP are

tested. The hypotheses are that GDP pe capita and LF:GDP will be positively correlated to industrial labour force share. The implications of such a positive correlation are that, if industrial labour force sizes are falling, GDP per capita will be lower, and LF:GDP ratios will be lower than 1.0.

Both these hypotheses are supported (table 6-4). GDP per capita clearly rises for the total sample, but not for OICs (figure 6-30). The variation in peak industrial labour force size in the OICs, ranging from 36% for Canada to 50% for Switzerland, is not correlated to variations in national income, which are larger over time. For other 'post-industrial' countries, it is. Similarly, the OICs have LF:GDP ratios that do not vary with industrial labour force share, but cluster just above 1.0 (figure 6-31).

Since the peak of OIC industrialisation, the lower a country's industrial labour force share, the lower the associated GDP per capita, and the lower the LF:GDP ratio. In particular, the LF:GDP ratios are below 1.0 for most later industrialisers. There is some overlap between OICs and other countries, such as Spain, Taiwan, Italy, and Finland. But generally, NICs and SICs did not make the same GDP per capita gains the OICs made from industrial labour force growth, by their industrial labour force peaks. While it is undeniable that growth of the industrial sector is associated with GDP growth, the strength of this relationship has weakened since the OIC's peaks. Any expected social and economic results from industrialisation must be significantly different today than they were in 1950.

II. Summary

Linear trends are examined for indicators at three labour force benchmarks,

Table 6-5 Summary of Slope Values for Indicators versus Industrial Labour Force at the Manufacturing Employment Peak

Key:

Bold text**	R^2 highly significant; 1% probability
Bold text	R^2 significant; 5% probability
Regular (t)	R^2 has 6-10% probability; slope notable
Regular	R^2 has 11-35% probability; slope notable
--	Probability of R^2 greater than 35%

Indicator	Unweighted			Weighted by Population		
	All Countries	Older Industrial Countries	Newer Industrial Countries	All Countries	Older Industrial Countries	Newer Industrial Countries
GDP per capita	**+153.406***	--	**+244.839***	**+171.224****	--	**+328.932****
Industrial labour force share / GDP share	**+0.0139****	--	**+0.0126****	**+0.0147****	**-0.0111****	**+0.0213****

Figure 6-30 GDP per Capita versus Industrial Labour Force Share at the Manufacturing Employment Peak

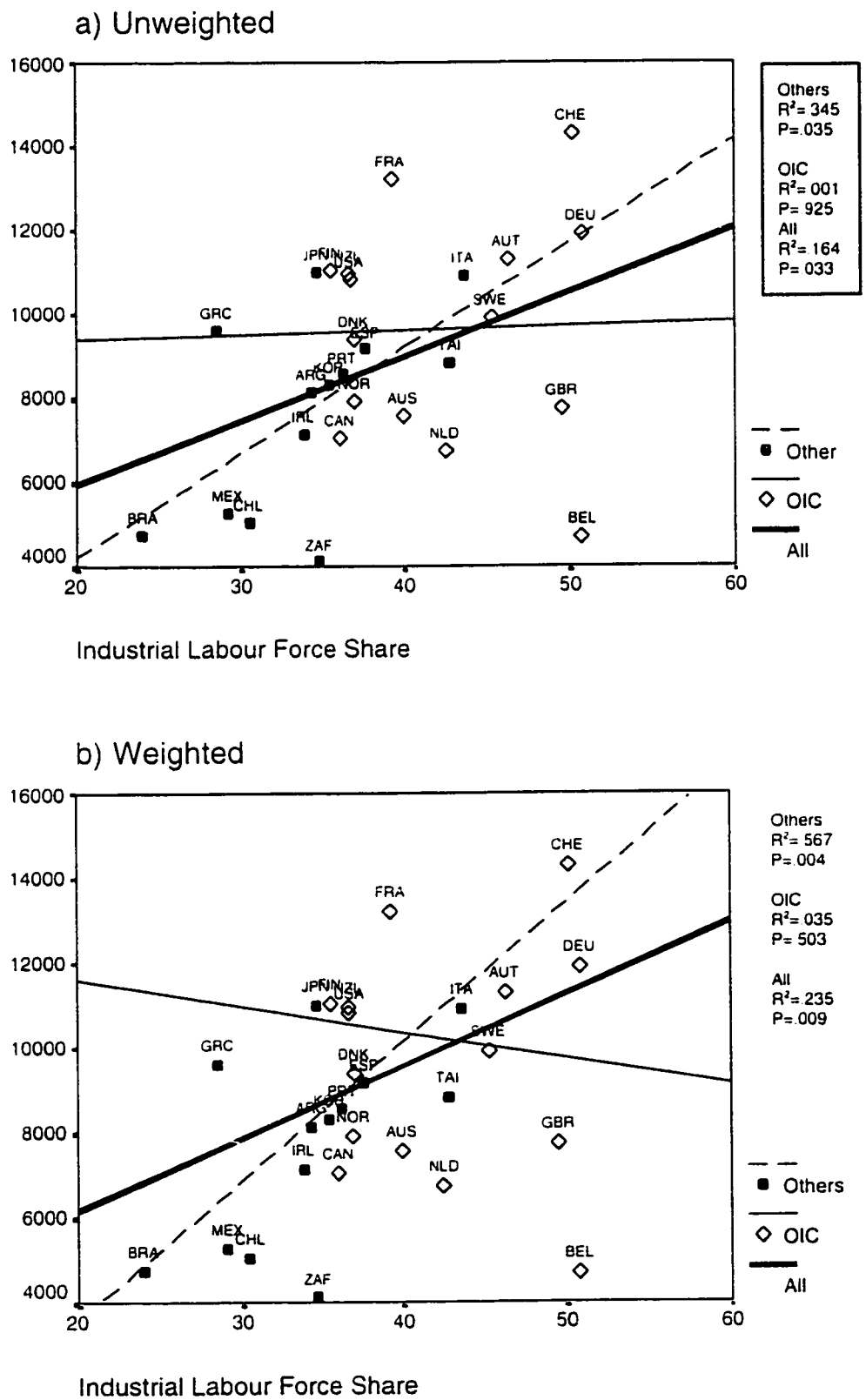
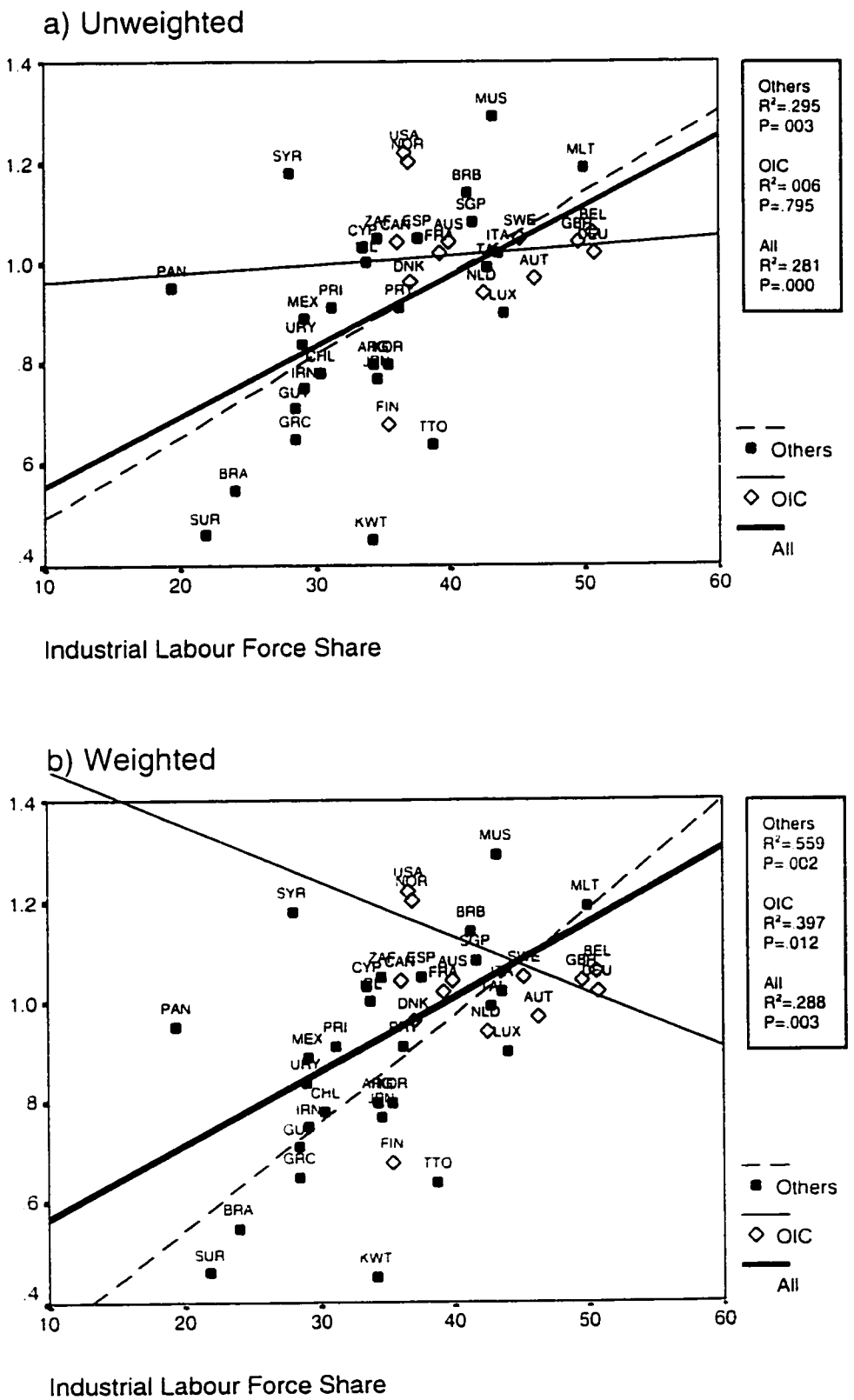


Figure 6-31 The Industrial LF:GDP Ratio versus Industrial Labour Force Share at the Manufacturing Employment Peak



agriculture=60% (AG=60%), industry=20% (IND=20%), and the manufacturing employment peak (MF PEAK). In general, the results confirm that structural transformation patterns are shifting over time; in particular, the relative industrial labour force size is declining. Its share size is also falling relative to industry's GDP share. However, the accompanying patterns of share distribution in other sectors also vary over time, and they vary between country types. The direction of some shifts is not constant between the MF PEAK and the two other indicators. In particular, total labour force participation, GDP per capita, and service and agricultural sectoral trends vary. Within the MF PEAK benchmark, OICs often differ from other 'post-industrial' countries. The most important of these differences is that industrial labour force share is not correlated to rising GDP per capita for OICs, but GDP per capita does rise over time for OICs. By contrast, in other 'post-industrial' countries, GDP per capita shows a tendency to be higher, and labour force share shows a tendency to be lower.

The AG=60% and IND=20% benchmarks produce similar results throughout. There is no change in GDP per capita at the benchmarks over time, industrial labour force share declines, industrial GDP share rises, and the industrial LF:GDP ratio falls below 1.0. The latter indicates a declining importance for industrial labour within the income-generating industrial sector.

Services also show a clear pattern at this benchmark. Labour force share increases, while GDP share declines. The resulting LF:GDP ratio actually rises towards 1.0, demonstrating a relative improvement in the balance between service income and service labour force participation. However, it shows that the relative labour force growth is within a sector with declining importance for national income generation. This raises important questions about the social status of service labour, the possible need to

renegotiate labour-industry relations.

The rise towards 1.0 in the service sector also has to be considered in the light of agricultural changes. At these benchmarks, agricultural labour force share does show some decline over time, especially for the weighted data, but overall trends for agricultural labour force and GDP shares are variable or unclear. Most importantly, the LF:GDP share, while declining, is still above 1.0, and close to 2.0 for many countries. The rise in the service LF:GDP ratio has to be considered in the light of very high, but falling, labour-intensity in agriculture, and deceasing labour intensity in industry.

The MF PEAK benchmark does show a significant change in the size of GDP per capita over time. However, while GDP per capital rises significantly for OICs, in other countries it shows a slight (not significant) tendency to decline. As was noted in chapter five, there is a clear tendency for the duration of large industrial labour force shares, to decline over time. However, this trend is significant *between* OICs and other 'post-industrial' countries, but not for OICs.

A similar pattern can be seen for industrial labour force share. There is a general decline between the two groups, but not within either. In fact, the clearest difference between the two groups, for all indicators, is the increase in variation for patterns in non-OIC 'post-industrial' countries. There is a tendency for industrial LF:GDP share to drop towards 1.0 at the MF PEAK for OICs. Other post-industrial countries show a divergence between labour intensive and capital-intensive patterns, with ratios either well above 1.0, or well below 1.0.

The service sector shows few identifiable patterns with this test, though there is an increase in variation over time. The only trends that do emerge are the reverse of those expected, that is, a tendency for labour force share to show a decline for weighted data.

This seems to be due to two countries, Germany and the US, which have different industrial and service sector patterns, separated by 20 years.

Surprisingly, agricultural labour force share showed a significant increase over time at the MF PEAK, both for weighted and unweighted data. This was accompanied by a clear rise above 1.0 for the LF:GDP share for OICS. By contrast, the 'post-industrial' NICs and SICs had a ratio falling towards 1.0 though most are still high. Once again, a pattern of increasing variance is visible in the graphed results. On the whole, the NICs have higher ratios than the OICs, raising the question whether agriculture might play a greater role in acting as an employer of last resort in later industrialisers.

Results at the MF PEAK become easier to interpret when GDP per capita and the industrial LF:GDP ratio are graphed against the industrial labour force share. What emerges are separate histories for OICs and other post-industrial countries. An overall tendency for GDP per capita to rise with industrial labour force share, is not present at the MF PEAK for OICs. OIC incomes were high at this stage, regardless of industrial labour force share. On the other hand, GDP per capita shows a definite correlation with industrial labour force share for the entire sample. The whole sample also shows a declining labour force share. A similar difference in patterns emerges for the industrial LF:GDP ratio. Ratios drop below 1.0 for low labour force shares; a pattern which affects only NICs and SICs.

The question raised by these results in particular, is whether rising OIC income was intrinsically related to industrialisation, or to relations within OICs (and perhaps between OICS and other countries). If the latter is the case, the internal social and economic relations of the OICs regarding industrialisation are important in development, rather than industrialisation itself.

CHAPTER 7

DISCUSSION AND DIRECTIONS FOR FUTURE RESEARCH

I. Overview

This dissertation opened with the observation that export-led industrialisation has risen in many less industrialised countries (LICs) since the 1980s (Helleiner, 1992, 1995; IMF, 1997), but questioned whether it could be the basis for future development. The question was based on an apparent contradiction between a redefinition of the basis for older industrial country (OIC) economic strength, on one hand, and general trends affecting world economic relations, on the other.

Knowledge is increasingly seen as the 'engine of growth' for the OICs, since the transfer of much labour-intensive industry to newly industrialised countries (NICs) and semi-industrialised countries (SICs), and the rise of knowledge-intensive and capital-intensive economic activity, (OECD 1992, 1992). Such an engine of growth is dependent on continued international economic specialisation. Knowledge-intensive activity is expected to drive growth in the OICs, and labour-intensive activity is expected to drive growth in the LICs.

Three general trends are seen as potentially disrupting this proposed pattern. First, an overall increase in capital-intensity in industry could lower both the LIC industrial labour force size and its pay, and thus reduce the multiplier effects of demand. Second, the existing patterns of international specialisation, and especially the role of transnational corporations, could also reduce local linkages and reduce the transfer of high-paying jobs. Finally, an increase in world wide competition, both from capital-intensive

OIC production, and from labour-intensive LIC production, could quickly threaten the economic gains of industrial labour in the NICs. Industrial activity in NICs has increasingly moved offshore to lower labour-cost locations, or to OICs with competitive capital-intensive production methods.

The above three trends led to the general hypothesis that NIC and SIC patterns of industrialisation do not replicate those of the OICs. More specific hypotheses were that: the maximum industrial labour force would be smaller; the length of time the industrial labour force grows and remains large (above 30% in this study) would be shorter; industrial pay would be lower; and there would be a weaker relationship between industrial growth and GDP growth.

The empirical study addressed two perceived gaps in the development literature. First, most existing development literature addresses itself to the *means* of industrialisation. It does not incorporate the increasingly important reality that industrialisation also *continually changes*, and that this change must be continually managed. That literature which does address industrial restructuring tends to focus on the OICs. There is also an emerging body of literature on industrial restructuring in the LICs and NICs, but it is centred largely on case studies (ex: Humphrey and Schmitz, 1996), or country and industry studies (ex: G. L.Clark, 1995). Thus, the empirical study was designed to provide evidence of a more widespread shift in industrial patterns, which affected countries at all levels of industrialisation.

The results of the analysis confirm the hypotheses (tables 7-1, 7-2). Industrialisation, followed by de-industrialisation, shows a trend to be more rapid over time. Maximum industrial labour force shares tend to be smaller; peak labour force shares tend

Table 7-1 Changes in Trend at the AG=60% and IND=20% Benchmarks

Variable	Hypothesised Change	Results
Total GDP per capita	Varies	
Industry		
Labour force share	Falls	✓
Share of GDP	Rises	✓
Labour force to GDP ratio	Falls	✓
Service		
Labour force share	Rises	✓
Share of GDP	Falls	✓
Labour force to GDP ratio	Rises	✓
Agricultural		
Labour force	Falls	✓
Share of GDP	Varies	-
Labour force to GDP ratio	Varies	-
Labour force participation	Falls	✗

Table 7-2 Changes in Trends at the Manufacturing Employment Peak

Variable	Change	Results All	OIC	Others
GDP per Capita				
Value of GDP per capita at peak	Varies		✓	
Industry				
# Years the labour force is above 30%	Falls	✓		
GDP at labour force peak	Rises			
Labour Force to GDP ratio at Peak	Falls	✓	✓	
Service				
Labour force value at MF PEAK	Rises	✗		
GDP share at MF PEAK	Falls			
Labour Force to GDP ratio at Peak	Rises			
Agriculture				
Peak industrial labour force value	Falls	✗		
GDP at labour force peak	Falls			
Labour Force to GDP ratio at Peak	Falls over time	✗	✗	
Labour Force Activity (Males 35-39)				
Labour force at MF PEAK	Falls	trend		trend

to be associated with lower GDP per capita; and the ratio of industrial labour force share to GDP share tends to fall below 1.0 over time. The latter finding was apparent even at early stages of industrialisation where industrial GDP share was still rising. It indicates a declining social position for labour, as labour activity is less directly associated with the income generating sector. By contrast, the service labour force was larger over time during early industrialisation, even though its GDP share was falling. In the cross-country application of the *expansion method paradigm*, in chapters 3 and 4, the rate of change in structural transformation was seen to have increased measurably during 1980 to 1990. Patterns have shifted with respect the relative position of sectoral labour, and associated GDP share.

At the manufacturing employment peak, the study actually found a significant difference in patterns between OICs and other countries, rather than a continuous change in industrialisation over time. While there was an overall decline in industrial labour force share at the MF PEAK sample, there was no decline for the OICs; in fact, there was slight tendency to increase. It was also notable that GDP per capita was positively correlated to time for OICs but not to industrial labour force share. That is to say, income rose in OICs over time, regardless of the industrial labour force size. Later post-industrial countries did not experience a relative rise in GDP per capita over time. Overall, theyu had smaller industrial labour forces over time, and overall, industrial labour force was positively correlated to GDP per capita.

II. Discussion of Results

The rationale for examining industrial labour force share in general, and industrial

pay in particular, was provided by the regulation school. Its historical interpretation of OIC development gives the same central importance to industrialisation, mass production, and consumption as Rostow (1960) did. But, it also incorporates the potential effect of systemic change in industry. It differs from other industrial restructuring schools, such as flexible specialisation and the techno-economic paradigm, by taking a more skeptical approach when evaluating the potential social impact of industrial change. Like the other industrial restructuring schools, the regulation school considers the importance of social relations and institutions in industrial restructuring. It places more central importance on their theoretical significance, though. It does not yet have a definition of the social relations necessary for new industrial systems, but defines itself as a research project for this purpose (Aglietta, 1998). For example, Tickell and Peck (1995) reject the flexible specialisation school as a valid interpretation of the emerging industrial system, on the basis that it has no theory of an accompanying system of social regulation.

In addition to the above emphases on the historical role of mass production and on social regulation, Aglietta (1998) specifically identified waged labour as the most important social feature of industrial society. This identification provided this study with a subject to evaluate for change over time. To restate the regulation school's interpretation of the changing social and economic status of labour (see also p. 8-9): interwar and post World War II labour in the OICs made significant advances in its social and economic position, through regulated production and wage bargaining mechanisms. Saturated demand and high labour costs led to declining profits, and, eventually, a decline in the social and economic status of waged labour. As new national and international markets were sought, the incomes of nationally-based industrial labour became polarised.

Some benefitted from new production methods and skills, while most experienced income stagnation, relative decline, or absolute decline, resulting from international competition and capital-intensive production (Minford et al, 1997). It has been proposed that this polarisation of the OIC workforce be rectified through international specialisation. Knowledge-intensive OIC production is expected grow to meet emerging NIC demand.

It is clear from the shorter duration of industrial labour force growth, and the lower pay associated with NIC industrialisation, that this expectation cannot be held uncritically. The studies here provides evidence that rising industrial pay and industrial labour force size does not automatically follow industrial growth the same way it did in the post-war OICs. A highly competitive, rapidly changing world economic system weakens the relationship. In fact, the study provides evidence that the OIC experience was unique.

The study does not specifically address how the relationship between social relations and industrial production can be reformulated, but focuses on providing evidence of the international impact of industrial change. However, some comments can be made about the implications of the results, based on the literature review. An increasing emphasis in the literature on social relations and institutions (ex: Adelman and Morris, 1997; Streeten, 1997; Lall and Latsch, 1998; Wolfensohn, 1998; *New York Times*, 29 January, 1999) is notable for several reasons. At the international level of economic interaction, it acknowledges that there is a gap between the current geographical extent of industrial and economic systems, and the geographical extent of existing systems of governance. At the more local level of interpersonal and cultural systems of social and

economic support, it acknowledges that there are important social dimensions to industrialisation and modern economic growth. These include, among others, the social and financial systems most conducive to the development and dissemination of new knowledge and information, the means of efficient and just income distribution and stability in a volatile economic environment, and effective decision-making processes incorporating social concerns.

A second observation from the literature review contrasts the relative position of industrial development versus institutional and social development within theories of growth and development. Industrial processes and the role of industry are changing in the OICs, leading the industrial restructuring schools to redefine the factors of production. For example, new growth theory and the industrial restructuring schools attempt to incorporate technology as an endogenous factor, and struggle to define 'human' capital. Within the LICs, the assumptions behind industry-centred development are increasingly challenged. These changes are summarised below in direct contrast to Simon Kuznets' (1966) *common transnational patterns*, which were assumed to underlie a universal process of structural transformation (see p. 25 for original list). Since industry and its social impact is continuously changing, the theoretical order of importance of industry on one hand, and social relations and institutions on the other, may need to be revised.

1. The *industrial system* itself can no longer be seen as a common transnational pattern, since it changes itself. Furthermore, it is actively specialised across national boundaries according to technology and other differences. This means that educational requirements for industry vary greatly, and that urbanisation, seen as a cultural norm of industry and structural transformation, has become increasingly dissociated from industrial growth, both in production and labour force activity.

2. The concept of a *community of human wants and aspirations* is challenged by growing knowledge about ecosystem diversity and human diversity. The latter is

apparent both across cultures and within cultures. Across cultures, different physical habitats and different belief and knowledge systems affect general concepts of industrialisation and development, and the appropriateness of economic activity, including industry. Within cultures, the varying social and economic status and needs of women, men, children, elders, and other social subgroups are increasingly identified and studied.

3. The concept and importance of the *nation-state* is also subject to redefinition. International economic activity, including its environmental impact, is increasingly seen as requiring international regulation and management. Also there has been increased recognition of sub-national systems economic organisation, including both spatial scales of local and regional activity, and cultural and communal systems of production, innovation, and exchange.

Most industrial restructuring and industry-centred development theory places institutions and social relations in the role of facilitator and safety net. The purpose of government is seen as setting up functioning legal systems and regulated banking systems to allow the efficient operation of the market. By demonstrating the existence of continuous industrial change and its ability to affect on the NICs, SICs, and LICs, the study establishes some stronger logical links with some 'alternative development' schools than with the industrial restructuring schools. In brief, if emerging industry in SICs and LICs is more capital-intensive than in early OICs, the associated policy recommendations for identifying and acknowledging the social bases of flexible and changeable production are already applicable.

Far from focusing labour-intensive mass production, LICs need to identify and develop the social-systems for decision-making, communication, and reciprocity for the adaptation and management of continually changing industrial and economic systems. A changeable system makes a better case for those schools which focus on the importance of participation over the importance of adopting or adapting a given industrial system. This observation is not made in support of an anti-industrial or anti-modernist approach

per se. If one accepts Gillis' et al (1992) identification of the central process of modern economic growth as *the application of scientific knowledge to economic production*, redefining industrialisation, and other economic development, to incorporate systemic change is not a refutation of modern economic growth. Expanding the concept of *scientific knowledge* to include areas outside the original assumptions of the neo-classical and development economics schools is a fundamental change, though.

The processes of industrialisation now must incorporate more complex understandings of social and cultural phenomena, natural ecosystems, human development, and human aspirations with economic activity. In effect, once technology and innovation are identified as central to economic growth and industrialisation, the social and cultural understanding of knowledge, technology, and change move to the fore. To adequately incorporate these concerns in development practice, central attention has to be shifted to those human rights which allow widespread local participation in and influence upon economic and other processes of social change, as opposed to the adoption of and incorporation of existing external economic activity.

Given the existence of a continuously changing system, with a weaker impact on LICs, there is more justification for defining development as the hybrid adaptation of modern economic development (after Arturo Escobar, p. 47 in chapter 2). Here, as stated in chapter 2, development is seen as an endemic, human behaviour, which involves the continued recreation of culture, rather than its transformation according to a set of common transnational patterns or universal factors. Such a definition is more likely to be practical in the long run, on the basis that the need for any participatory decision-making and governing systems will outlive any given configuration of industry. Attempting

either the replication of modern economic growth, as experienced in the OICs, or industrialising through affiliation with an externally defined international system, leaves LICs trying to exploit a system whose potential for generating social wealth has shrunk. Again, this is not to reject affiliation with an international system, which some theorists propose. Corbridge (1998) sees this as potentially self-defeating and repressive. Rather it acknowledges that both the system, and the affiliation, are changeable. They are therefore secondary to social decision-making processes, and concerns of social justice, and should be negotiable at all times. To truly address the effects of international industrial change, functioning institutions, participation, and social relationships need to have the primary importance when addressing industrialisation and development. Effectively, this gives development and industrialisation a more political and social definition, than its previous economic definition.

A process which changes (industrialisation) cannot logically sit at the centre of theories about change (social and economic development theories). The causes of industrial change, whatever they are, must hold that position. While institutions and social relations are not identified as the root causes of change in any literature, the causes of change are more likely to be manifested in them, than in abstract notions of industrialisation. Industrialisation itself embodies institutions and social relations which are only beginning to be studied.

III. Implications for Further Research

The implications of the empirical results for further research fall into two general categories, 1) technical improvements of the statistical study, and 2) definitions of

development, and economic and social structures.

A. Improved Indicators and Possibilities for Further Research

Throughout the study, various points for improvement and extension have been mentioned. At the outset, for example, three new factors affecting contemporary industrialisation were identified and three hypothetical new patterns for structural transformation were proposed (figure 1-1, p. 16).

Of the three factors identified, technological change, international economic specialisation, and increased competition, the latter two can be further tested through international variations in import and export patterns, and the relative contribution of traded items to GDP. The expectation is that some countries would show a tendency to trade lower-value items at high levels of industrial employment, relative to the OICs. Others would quickly transform to more knowledge-intensive economies, trading higher-value goods at earlier stages. Evidence of this divergence was seen at the MF PEAK. It is not impossible that both trends could exist in one country, with a relatively small labour force associated with the latter activity in a highly polarised economy. Such is already the case for the software trade in India.

The hypothesised change in knowledge-based industries was also not tested directly. In addition to the trade indicators mentioned above, detailed manufacturing and service employment data and wage[1] data could be employed to test this. Collected and published by the ILO, these data cover a smaller country sample, since surveying is extremely difficult in many cases. It is still possible that a sample of a size and quality similar to the

---

[1] To obtain estimates of pay from nationally specific wage data, ratios of sectoral wages to total wages would have to be calculated, and variation measured between countries.

45 countries examined at the MF PEAK benchmark could be obtained. Participation in knowledge-intensive sectors can be better measured from wage and employment ratios and relative pay levels at the subsector level. The use of trade data, and more detailed 'employment vs pay' data is seen as the next logical step in the analysis. Time constraints caused it to be left out here.

Several other possible variable by variable improvements can also be identified. The third revision of the International Labour Organisation's (ILO) International Standard Industrial Classification (ISIC) provides a more detailed breakdown of major economic activities than those shown in Appendix V. In particular, 'community, social, and personal service' are divided into four separate categories, including public administration, education, heath and social work, and others. Restaurants and hotels are also separated from trade and wholesale services, which would assist in the identification of tourist economies. It will be some time before these data are available in long time-series, but great potential is there, and current cross-sectional comparisons between the two ISIC systems may be of interest.

Another limitation stems from the use of GDP per capita data to estimate general income levels. The disparity in income distribution between countries is well documented and has become a particular focus of the United National Development Programme's *Human Development Report.* Although the existence of time-series data is limited, comparative cross-sections between GDP per capita on one hand, and average, medium, or modal income, on the other, would provide further social depth to the relationship between industrial change and income change.

Finally, within the realm of technical improvement (and limitations), the 'country'

itself is a decreasingly useful unit for analysis. Greater regional data are needed for comparisons, especially with the large, representative cases of China and India. Simple comparisons of these countries with smaller countries, to assess global change, borders on the ludicrous. While weighting the data adds another level of detail, it does not correct the problem of masking regional differences. To some degree, cross-sectional analyses which incorporate income disparity data, would alleviate the problem.

B. Defining Development and Social and Economic Structures

As noted in chapter 2, industrialisation became synonymous with development for two reasons. It added value to goods and increased their availability through increased productivity; and it reorganised people, resources, and capital for production. The observed changes to industry are of profound importance, then. As noted above, a systematic identification of such processes is beyond the scope of this conclusion, but some recently identified questions and potential answers can be mentioned for the further refinement of the study.

The creation of a large, well-payed working class, then middle class, was a lengthy and complex social process, as the regulation school and institutional economists have pointed out. This process included the establishment of labour laws, collective bargaining systems, the GDP measure itself, and international monetary regulations. Its measurement was based on socially-accepted definitions of what value can be accorded to industrial activity, and what costs can be ascribed to it. The re-evaluation of economic activity, as labour shifts from one sector to another, and the re-evaluation of the costs and benefits of social and environmental change, are tasks that are only beginning to be systematically evaluated. Alternative indices to GDP, which consider volunteer (unpaid)

activity, and resource costs (ex: Cobb et al, 1995), provide an interesting basis for re-assessing the value-added potential of industry versus service and agriculture. Likewise, the correlation of labour force share and GDP share with other development indicators, such as the Human Development Index, would be of considerable interest.

In brief, the results of the study open up avenues for further research. The refinement and extension of the hypotheses identified in chapter 1 can be done with available indicators. The re-measurement of the impact of industrialisation according to other measures of development is also possible. Late twentieth century and early twenty-first century industrialisation will, undoubtedly, contribute to income and social well-being. But as industry shifts from a more central to peripheral position as an employer, the means of ascribing value to activities along the production chain, and within social systems, needs to be reassessed.

APPENDIX I:

World Bank (1983) Data for Pandit and Casetti's (1989) Original Study

NAME	YEAR	AG	IND	SERV	GNP
Algeria	1960	67.0	12.0	21.00	691
	1965	58.8	13.6	27.60	719
	1970	50.0	15.0	35.00	1027
	1977	32.0	22.1	45.90	1196
	1980	25.4	25.0	49.60	2140
Angola	1960	69.0	12.0	19.00	1659
	1965	66.5	13.0	20.50	1990
	1970	64.0	14.0	22.00	2102
	1977	60.5	15.4	24.10	894
	1980	59.0	16.0	25.00	840
Argentina	1960	20.0	35.9	44.10	1886
	1965	18.2	34.0	47.80	2093
	1970	16.4	32.1	51.50	2450
	1977	14.0	29.2	56.80	2719
	1980	13.1	28.0	58.90	2560
Australia	1960	11.4	40.0	48.60	6549
	1965	9.6	38.4	52.00	7704
	1970	8.1	36.6	55.30	9509
	1977	6.3	34.0	59.70	10626
	1980	5.6	32.8	61.60	11080
Austria	1960	24.0	46.0	30.00	4757
	1965	19.1	45.0	35.90	5705
	1970	14.8	43.0	42.20	7144
	1977	10.1	38.8	51.10	9275
	1980	8.5	36.7	54.80	10210
Bangladesh	1960	87.0	3.0	10.00	102
	1965	86.5	3.0	10.50	114
	1970	86.0	3.0	11.00	119
	1977	78.6	7.6	13.80	118
	1980	74.0	11.0	15.00	140
Belgium	1960	8.0	47.7	44.30	5692
	1965	6.3	46.4	47.30	7059
	1970	4.9	44.8	50.30	8797
	1977	3.4	42.3	54.30	11117
	1980	2.9	41.1	56.00	11920
Benin	1960	54.0	9.0	37.00	292
	1965	52.0	10.4	37.60	300
	1970	50.0	12.0	38.00	300
	1977	47.2	14.7	38.10	298
	1980	46.0	16.0	38.00	320
Bolivia	1960	61.0	18.1	20.90	391
	1965	58.2	19.6	22.20	447
	1970	55.4	21.1	23.50	498
	1977	51.5	23.3	25.20	617
	1980	49.7	24.2	26.10	600
Brazil	1960	51.9	14.8	33.30	901
	1965	48.8	16.5	34.70	947
	1970	45.6	18.3	36.10	1232
	1977	34.3	22.6	43.10	1952
	1980	29.9	24.4	45.70	2220
Burkina Faso	1960	92.0	5.0	3.00	182
	1965	89.8	6.3	3.90	189
-	1970	87.0	8.0	5.00	202
	1977	83.7	11.3	5.00	188
	1980	82.0	13.0	5.00	240
Burundi	1960	90.0	3.0	7.00	155
	1965	88.6	3.5	7.90	165
	1970	87.0	4.0	9.00	200
	1977	85.0	4.7	10.30	205
	1980	84.0	5.0	11.00	230
Cameroon	1960	87.0	5.0	8.00	474
	1965	86.0	5.5	8.50	503
	1970	85.0	6.0	9.00	572
	1977	83.6	6.7	9.70	621
	1980	83.0	7.0	10.00	880
Canada	1960	13.3	34.5	52.20	6094
	1965	10.5	33.4	56.10	7379
	1970	8.2	32.1	59.70	8596
	1977	5.7	29.9	64.40	10862
	1980	4.9	28.9	66.20	11400

NAME	YEAR	AG	IND	SERV	GNP
Central African Re	1960	94.0	2.0	4.00	344
	1965	92.6	2.5	4.90	321
	1970	91.0	3.0	6.00	346
	1977	89.0	3.7	7.30	368
	1980	88.0	4.0	8.00	320
Chad	1960	95.0	2.0	3.00	198
	1965	92.9	2.8	4.30	186
	1970	90.0	4.0	6.00	183
	1977	86.7	5.9	7.40	171
	1980	85.0	7.0	8.00	110
Chile	1960	30.5	20.0	49.50	2032
	1965	26.4	20.6	53.00	2200
	1970	22.6	21.0	56.40	2477
	1977	20.2	19.9	59.90	2213
	1980	19.2	19.4	61.40	2560
Colombia	1960	51.4	19.2	29.40	756
	1965	44.6	20.3	35.10	807
	1970	37.9	21.0	41.10	935
	1977	29.2	21.3	49.50	1198
	1980	25.8	21.2	53.00	1380
Costa Rica	1960	51.2	18.5	30.30	857
	1965	46.6	19.5	33.90	923
	1970	42.1	20.4	37.50	1102
	1977	32.7	22.4	44.90	1383
	1980	29.0	23.0	48.00	1430
Cote d'Ivoire	1960	89.0	2.0	9.00	666
	1965	86.7	2.5	10.80	896
	1970	84.0	3.0	13.00	1064
	1977	80.6	3.7	15.70	1102
	1980	79.0	4.0	17.00	1200
Denmark	1960	18.0	37.1	44.90	7463
	1965	14.2	37.2	48.60	9211
	1970	11.1	36.9	52.00	10782
	1977	7.7	36.0	56.30	12729
	1980	6.6	35.4	58.00	13120
Dominican Republic	1960	66.5	12.2	21.30	683
	1965	63.9	13.1	23.00	739
	1970	61.2	14.0	24.80	891
	1977	52.7	16.8	30.50	1245
	1980	49.0	18.0	33.00	1260
Ecuador	1960	57.4	19.4	23.20	
	1965	54.2	20.8	25.00	653
	1970	50.9	22.2	26.90	690
	1977	51.5	18.5	30.00	1037
	1980	51.6	17.1	31.30	1180
Egypt, Arab Republ	1960	58.0	12.0	30.00	288
	1965	56.2	15.2	28.60	367
	1970	54.0	19.0	27.00	384
	1977	51.6	26.4	22.00	512
	1980	50.0	30.0	20.00	650
El Salvador	1960	61.7	17.1	21.20	499
	1965	58.9	18.4	22.70	596
	1970	56.1	19.7	24.20	636
	1977	52.2	21.6	26.20	735
	1980	50.5	22.4	27.10	650
Ethiopia	1960	88.0	5.0	7.00	108
	1965	86.1	5.5	8.40	123
	1970	84.0	6.0	10.00	131
	1977	81.3	6.7	12.00	132
	1980	80.0	7.0	13.00	140
Finland	1960	36.1	31.4	32.50	5280
	1965	28.1	33.4	38.50	6393
	1970	21.3	34.6	44.10	7967
	1977	13.9	34.8	51.30	9798
	1980	11.4	34.5	54.10	10680
France	1960	22.1	38.7	39.20	5821
	1965	17.5	39.5	43.00	7219
	1970	13.7	39.7	46.60	8997
	1977	9.5	39.3	51.20	11140
	1980	8.1	38.9	53.00	12190
Gambia, The	1960	85.0	7.0	8.00	266
	1965	83.6	7.5	8.90	292
	1970	82.0	8.0	10.00	307
	1977	79.9	8.7	11.40	430
	1980	79.0	9.0	12.00	370

NAME	YEAR	AG	IND	SERV	GNP
Germany	1960	14.2	47.7	38.10	7052
	1965	10.4	48.2	41.40	8376
	1970	7.5	48.1	44.40	10141
	1977	4.7	47.1	48.20	11810
	1980	3.8	46.4	49.80	13450
Ghana	1960	64.0	14.0	22.00	534
	1965	61.0	15.5	23.50	550
	1970	58.0	17.0	25.00	572
	1977	54.5	19.1	26.40	479
	1980	53.0	20.0	27.00	400
Greece	1960	55.8	19.8	24.40	1587
	1965	50.9	21.9	27.20	2236
	1970	46.0	24.0	30.00	3093
	1977	39.3	26.8	33.90	4042
	1980	36.6	28.0	35.40	4420
Guatemala	1960	66.7	14.4	18.90	687
	1965	63.9	15.8	20.30	773
	1970	61.0	17.3	21.70	888
	1977	56.8	19.5	23.70	1092
	1980	55.5	20.5	24.00	1140
Guinea	1960	88.0	6.0	6.00	282
	1965	86.6	6.9	6.50	293
	1970	85.0	8.0	7.00	293
	1977	83.0	10.0	7.00	346
	1980	82.0	11.0	7.00	300
Haiti	1960	80.0	6.4	13.60	284
	1965	77.3	6.8	15.90	268
	1970	74.2	7.1	18.70	252
	1977	73.7	7.2	19.10	291
	1980	73.5	7.2	19.30	300
Honduras	1960	70.2	10.6	19.20	462
	1965	68.4	11.5	20.10	495
	1970	66.5	12.5	21.00	544
	1977	63.8	13.9	22.30	540
	1980	62.6	14.6	22.80	600
India	1960	74.0	11.0	15.00	178
	1965	74.0	11.0	15.00	194
	1970	74.0	11.0	15.00	221
	1977	70.8	12.5	16.70	237
	1980	69.3	13.2	17.50	260
Indonesia	1960	75.0	8.0	17.00	184
	1965	70.7	9.0	20.30	180
	1970	66.0	10.0	24.00	232
	1977	58.4	13.4	28.20	351
	1980	55.0	15.0	30.00	530
Ireland	1960	36.4	24.7	38.90	2586
	1965	31.2	27.9	40.90	3086
	1970	26.5	31.1	42.40	3901
	1977	20.6	35.5	43.90	4575
	1980	18.4	37.3	44.30	5230
Israel	1960	14.0	35.0	51.00	2608
	1965	11.9	35.1	53.00	3425
	1970	10.0	35.0	55.00	4477
	1977	7.8	35.7	56.46	5213
	1980	7.0	36.0	57.00	5160
Italy	1960	30.8	39.5	29.70	3242
	1965	34.3	42.0	23.70	4020
	1970	18.8	43.8	37.40	5305
	1977	12.7	45.1	42.20	6177
	1980	10.7	45.3	44.00	6960
Jamaica	1960	39.0	24.9	36.10	1196
	1965	34.1	25.4	40.50	1340
	1970	29.5	25.6	44.90	1577
	1977	23.7	25.4	50.90	1398
	1980	21.4	25.2	53.40	1180
Japan	1960	33.0	30.0	37.00	2778
	1965	26.0	32.3	41.70	4274
	1970	20.0	34.0	46.00	6978
	1977	14.1	37.6	48.30	8999
	1980	12.0	39.0	49.00	10080
Jordan	1960	44.0	26.0	30.00	.
	1965	40.6	16.0	43.40	.
	1970	34.0	9.0	57.00	1110
	1977	26.0	14.0	60.00	1421
	1980	20.0	20.0	60.00	1620

NAME	YEAR	AG	IND	SERV	GNP
Kenya	1960	86.0	5.0	9.00	274
	1965	84.1	5.9	10.00	295
	1970	82.0	7.0	11.00	334
	1977	79.3	9.0	11.70	358
	1980	78.0	10.0	12.00	420
Korea, Republic of	1960	66.0	9.0	25.00	451
	1965	58.3	12.6	29.10	544
	1970	50.0	17.0	33.00	791
	1977	38.7	25.1	36.20	1339
	1980	34.0	29.0	37.00	1700
Liberia	1960	80.0	10.0	10.00	
	1965	77.6	11.0	11.40	545
	1970	75.0	12.0	13.00	635
	1977	71.6	13.4	15.00	609
	1980	70.0	14.0	16.00	520
Libya	1960	53.0	17.0	30.00	1749
	1965	42.2	19.8	38.00	5599
	1970	32.0	22.0	46.00	10090
	1977	22.4	26.3	51.30	
	1980	19.0	28.0	53.00	8450
Madagascar	1960	93.0	2.0	5.00	384
	1965	91.6	2.5	5.90	371
	1970	90.0	3.0	7.00	421
	1977	88.0	3.7	8.30	336
	1980	87.0	4.0	9.00	330
Malawi	1960	92.0	3.0	5.00	139
	1965	90.6	3.5	5.90	142
	1970	89.0	4.0	7.00	152
	1977	87.0	4.7	8.30	189
	1980	86.0	5.0	9.00	200
Malaysia	1960	63.0	12.0	25.00	754
	1965	59.5	13.0	27.50	900
	1970	56.0	14.0	30.00	1054
	1977	51.8	15.4	32.80	1473
	1980	50.0	16.0	34.00	1840
Mali	1960	94.0	3.0	3.00	146
	1965	92.7	3.5	3.80	151
	1970	91.0	4.0	5.00	154
	1977	79.8	8.7	11.50	179
	1980	72.6	11.7	15.70	190
Mexico	1960	55.1	19.5	25.40	1032
	1965	50.2	21.2	28.60	1256
	1970	45.2	22.9	31.90	1558
	1977	28.4	25.0	46.60	1729
	1980	35.6	25.8	38.60	2250
Morocco	1960	62.0	14.0	24.00	527
	1965	59.5	15.4	25.10	571
	1970	57.0	17.0	26.00	684
	1977	53.5	19.7	26.80	876
	1980	52.0	21.0	27.00	860
Mozambique	1960	81.0	8.0	11.00	524
	1965	77.3	10.2	12.50	529
	1970	73.0	13.0	14.00	711
	1977	68.2	16.4	15.40	458
	1980	66.0	18.0	16.00	360
Myanmar	1960	.	.	.	128
	1965	.	.	.	143
	1970	69.9	8.0	22.10	143
	1977	68.0	9.2	22.80	158
	1980	67.1	9.8	23.10	190
Nepal	1960	95.0	2.0	3.00	150
	1965	94.5	2.0	3.50	156
	1970	94.0	2.0	4.00	159
	1977	93.3	2.0	4.70	163
	1980	93.0	2.0	5.00	150
Netherlands	1960	11.0	42.0	47.00	6508
	1965	9.5	42.9	47.60	7655
	1970	8.1	43.8	48.10	9585
	1977	6.6	44.5	48.90	11239
	1980	6.1	44.8	49.10	11790
New Zealand	1960	14.7	36.7	48.60	6039
	1965	13.2	36.3	50.50	6733
	1970	11.9	35.9	52.20	7289
	1977	9.8	35.3	54.90	7924
	1980	9.0	35.0	56.00	7700

NAME	YEAR	AG	IND	SERV	GNP
Nicaragua	1960	62.3	16.0	21.70	788
	1965	57.0	15.9	27.10	1116
	1970	51.3	15.5	33.20	1202
	1977	45.2	18.5	36.30	1419
	1980	42.6	19.9	37.50	860
Niger	1960	95.0	1.0	4.00	343
	1965	94.1	1.4	4.50	387
	1970	93.0	2.0	5.00	334
	1977	91.7	2.7	5.60	300
	1980	91.0	3.0	6.00	330
Nigeria	1960	71.0	10.0	19.00	563
	1965	66.7	11.9	21.40	644
	1970	62.0	14.0	24.00	707
	1977	56.5	17.4	26.10	888
	1980	54.0	19.0	27.00	870
Norway	1960	19.8	36.6	43.60	6601
	1965	15.4	37.2	47.40	7878
	1970	11.9	37.4	50.70	9133
	1977	8.2	37.0	54.80	12100
	1980	6.9	36.6	56.50	14060
Pakistan	1960	61.0	18.0	21.00	190
	1965	60.0	18.5	21.50	236
	1970	59.0	19.0	22.00	285
	1977	57.6	19.7	22.70	299
	1980	57.0	20.0	23.00	350
Papua New Guinea	1960	89.0	4.3	6.70	566
	1965	87.6	5.0	7.40	708
	1970	86.0	5.8	8.20	849
	1977	83.4	7.1	9.50	1010
	1980	82.1	7.7	10.20	840
Paraguay	1960	56.3	19.0	24.70	733
	1965	54.5	19.1	26.40	782
	1970	52.6	19.2	28.20	859
	1977	50.2	19.4	30.40	1130
	1980	49.1	19.4	31.50	1630
Peru	1960	52.5	19.6	27.90	923
	1965	50.3	19.0	30.70	1080
	1970	48.0	18.4	33.60	1108
	1977	42.2	18.5	39.30	1246
	1980	39.8	18.5	41.70	1170
Philippines	1960	61.0	15.0	24.00	444
	1965	57.1	15.5	27.40	493
	1970	53.0	16.0	31.00	547
	1977	48.1	16.7	35.20	696
	1980	46.0	17.0	37.00	790
Portugal	1960	44.1	29.0	26.90	965
	1965	38.6	31.2	30.20	1261
	1970	33.3	33.2	33.50	1745
	1977	29.7	34.6	35.70	2250
	1980	28.2	35.1	36.70	2520
Rwanda	1960	95.0	1.0	4.00	204
	1965	94.1	1.4	4.50	156
	1970	93.0	2.0	5.00	205
	1977	91.7	2.0	6.30	239
	1980	91.0	2.0	7.00	250
Senegal	1960	84.0	5.0	11.00	458
	1965	82.1	5.9	12.00	488
	1970	80.9	7.0	12.10	465
	1977	77.9	9.0	13.10	471
	1980	76.7	10.0	13.30	430
Sierra Leone	1960	78.0	12.0	10.00	284
	1965	74.7	13.5	11.80	318
	1970	71.0	15.0	14.00	350
	1977	66.9	17.7	15.40	326
	1980	65.0	19.0	16.00	320
Somalia	1960	88.0	4.0	8.00	288
	1965	86.6	4.9	8.50	245
	1970	85.0	6.0	9.00	251
	1977	83.0	7.3	9.70	232
	1980	82.0	8.0	10.00	280
South Africa	1960	32.0	30.0	38.00	1737
	1965	31.5	29.5	39.00	2124
	1970	31.0	29.0	40.00	2510
	1977	30.3	29.0	40.70	2729
	1980	30.0	29.0	41.00	2770

NAME	YEAR	AG	IND	SERV	GNP
Spain	1960	42.1	31.4	26.50	2396
	1965	33.6	34.8	31.60	3409
	1970	26.0	35.7	38.30	4392
	1977	17.4	39.8	42.80	5626
	1980	14.4	40.3	45.30	5640
Sri Lanka	1960	56.0	14.0	30.00	170
	1965	55.5	14.0	30.50	183
	1970	55.0	14.0	31.00	217
	1977	54.3	14.0	31.70	234
	1980	54.0	14.0	32.00	300
Sudan	1960	86.0	6.0	8.00	272
	1965	84.1	6.9	9.00	299
	1970	82.0	8.0	10.00	275
	1977	75.4	9.4	15.20	331
	1980	72.0	10.0	18.00	380
Sweden	1960	14.1	45.2	40.70	8595
	1965	10.9	43.1	46.00	10710
	1970	8.3	40.4	51.30	12598
	1977	5.5	36.1	58.40	13790
	1980	4.6	34.2	61.20	14840
Switzerland	1960	11.4	50.3	38.30	12012
	1965	9.5	49.5	41.00	14061
	1970	7.8	48.5	43.70	16143
	1977	5.9	46.8	47.30	16143
	1980	5.2	45.9	48.90	17430
Syrian Arab Republ	1960	54.0	19.0	27.00	636
	1965	52.5	20.0	27.50	785
	1970	51.0	21.0	28.00	871
	1977	38.1	28.0	33.90	1327
	1980	33.0	31.0	36.00	1570
Tanzania	1960	89.0	4.0	7.00	194
	1965	87.6	4.5	7.90	220
	1970	86.0	5.0	9.00	257
	1977	84.0	5.7	10.30	297
	1980	83.0	6.0	11.00	280
Thailand	1960	84.0	4.0	12.00	291
	1965	82.1	4.9	13.00	358
	1970	80.0	6.0	14.00	470
	1977	77.3	8.0	14.70	618
	1980	76.0	9.0	15.00	770
Togo	1960	80.0	8.0	12.00	219
	1965	76.7	9.4	13.90	302
	1970	73.0	11.0	16.00	352
	1977	68.9	13.7	17.40	388
	1980	67.0	15.0	18.00	380
Tunisia	1960	56.0	18.0	26.00	612
	1965	53.0	19.5	27.50	716
	1970	50.0	21.0	29.00	830
	1977	39.4	28.5	32.10	1282
	1980	35.0	32.0	33.00	1420
Turkey	1960	78.5	10.5	11.00	826
	1965	73.6	11.4	15.00	948
	1970	67.7	12.1	20.20	1137
	1977	58.1	12.7	29.20	1557
	1980	53.5	12.8	33.70	1540
Uganda	1960	89.0	4.0	7.00	274
	1965	87.9	4.5	7.60	312
	1970	86.0	5.0	9.00	353
	1977	84.0	5.7	10.30	298
	1980	83.0	6.0	11.00	220
United Kingdom	1960	4.0	47.7	48.30	6094
	1965	3.4	46.4	50.20	6862
	1970	2.8	45.0	52.20	7650
	1977	2.1	43.0	54.90	8609
	1980	1.9	42.1	56.00	9110
United States	1960	6.6	36.4	57.00	8064
	1965	5.0	35.5	59.50	9440
	1970	3.7	34.4	61.90	10423
	1977	2.4	32.8	64.80	11890
	1980	2.0	32.0	66.00	12820
Uruguay	1960	20.6	29.5	49.90	1976
	1965	17.7	30.4	51.90	1841
	1970	15.2	31.2	53.60	2104
	1977	12.0	32.1	55.90	2303
	1980	10.8	32.4	56.80	2820

NAME	YEAR	AG	IND	SERV	GNP
Venezuela	1960	34.9	22.2	42.90	2854
	1965	30.0	23.6	46.40	3422
	1970	25.6	24.9	49.50	3742
	1977	20.1	26.3	53.60	4357
	1980	18.0	26.8	55.20	4220
Yemen, Republic of	1960	83.0	7.0	10.00	.
	1965	81.1	7.9	11.00	.
	1970	79.0	9.0	12.00	250
	1977	76.3	10.4	13.30	386
	1980	75.0	11.0	14.00	460
Yugoslavia, Federa	1960	63.0	18.0	19.00	984
	1965	57.1	20.5	22.40	1279
	1970	51.0	23.0	26.00	1648
	1977	35.1	31.5	33.40	2351
	1980	29.0	35.0	36.00	2790
Zaire	1960	83.0	9.0	8.00	248
	1965	81.1	10.0	8.90	272
	1970	79.0	11.0	10.00	297
	1977	76.3	12.4	11.30	263
	1980	75.0	13.0	12.00	210
Zambia	1960	79.0	7.0	14.00	695
	1965	76.1	8.0	15.90	798
	1970	73.0	9.0	18.00	802
	1977	68.9	10.4	20.70	791
	1980	67.0	11.0	22.00	600
Zimbabwe	1960	69.0	11.0	20.00	903
	1965	66.5	12.0	21.50	894
	1970	64.0	13.0	23.00	1016
	1977	61.2	14.4	24.40	1009
	1980	60.0	15.0	25.00	870

APPENDIX II:

ILO Labour Force and Penn World Tables GDP per Capita Data

NAME	YEAR	AG	IND	SERV	GNP
Afghanistan	1950	75.51	9.70	14.79	.
	1960	71.53	10.39	18.08	.
	1970	66.12	12.07	21.81	.
	1980	72.62	9.81	17.57	.
	1990	70.33	10.65	19.02	.
Albania	1950	76.49	13.81	9.70	.
	1960	71.24	17.55	11.22	.
	1970	66.13	21.20	12.67	.
	1980	57.23	23.43	19.34	.
	1990	54.58	23.16	22.25	.
Algeria	1950	79.89	8.56	11.55	.
	1960	66.54	12.08	21.38	1723
	1970	47.37	21.31	31.32	1826
	1980	35.84	27.27	36.89	2758
	1990	26.13	31.28	42.59	2777
Angola	1950	83.87	5.75	10.38	.
	1960	81.10	6.45	12.45	931
	1970	78.33	7.15	14.52	1165
	1980	76.42	7.60	15.98	675
	1990	74.53	8.06	17.41	.
Argentina	1950	25.07	31.80	43.13	4032
	1960	20.61	34.04	45.34	4462
	1970	16.01	34.29	49.70	5637
	1980	12.95	33.68	53.37	6506
	1990	12.15	32.38	55.47	4706
Armenia	1950	55.62	21.41	22.97	.
	1960	43.14	27.27	29.59	.
	1970	27.14	37.85	35.02	.
	1980	21.19	42.94	35.87	.
	1990	17.61	43.06	39.33	.
Australia	1950	15.40	39.72	44.89	6678
	1960	11.32	39.91	48.77	7782
	1970	8.05	36.52	55.43	10756
	1980	6.49	32.16	61.35	12520
	1990	5.52	26.32	68.16	14445
Austria	1950	34.22	36.14	29.65	2930
	1960	23.83	46.28	29.89	5143
	1970	14.77	43.14	42.09	7510
	1980	9.94	40.53	49.56	10509
	1990	7.76	37.57	54.67	12695
Azerbaijan	1950	52.92	22.03	25.06	.
	1960	47.46	21.62	30.93	.
	1970	34.60	28.25	37.15	.
	1980	34.74	28.49	36.78	.
	1990	31.01	28.74	40.26	.
Bahamas	1950	24.62	26.53	48.85	.
	1960	20.20	25.04	54.76	.
	1970	7.59	21.37	71.03	.
	1980	5.77	16.76	77.47	11305
	1990	5.24	15.47	79.29	.
Bahrain	1950	16.59	46.51	36.89	.
	1960	13.55	44.69	41.76	.
	1970	7.24	38.27	54.49	.
-	1980	4.02	32.83	63.16	12724
	1990	2.02	29.75	68.23	.
Bangladesh	1950	88.14	4.70	7.17	.
	1960	86.02	4.79	9.18	952
	1970	81.44	4.87	13.69	1280
	1980	72.60	8.70	18.70	1085
	1990	65.24	16.41	18.34	1390
Barbados	1950	28.70	28.52	42.78	.
	1960	26.38	27.23	46.39	2666
	1970	16.79	41.25	41.95	4638
	1980	9.93	24.32	65.75	6379
	1990	6.66	23.40	69.94	.
Belarus	1950	70.02	12.64	17.34	.
	1960	55.29	20.33	24.38	.
	1970	34.69	33.53	31.77	.
	1980	25.78	38.43	35.78	.
	1990	19.71	40.28	40.00	.

NAME	YEAR	AG	IND	SERV	GNP
Belgium	1950	11.85	50.66	37.48	4433
	1960	7.96	47.52	44.52	5495
	1970	4.83	44.54	50.64	8331
	1980	2.95	35.07	61.98	11109
	1990	2.63	27.81	69.56	13232
Belize	1950	45.28	21.16	33.56	.
	1960	42.40	24.03	33.57	.
	1970	40.09	20.39	39.52	.
	1980	38.47	17.22	44.31	3943
	1990	33.57	18.73	47.70	3464
Benin	1950	88.49	3.19	8.32	.
	1960	85.02	4.16	10.82	1100
	1970	80.95	5.14	13.91	1118
	1980	67.32	7.14	25.54	1114
	1990	63.50	8.14	28.36	920
Bhutan	1950	95.32	2.53	2.15	.
	1960	95.02	2.13	2.85	.
	1970	94.71	1.73	3.56	.
	1980	94.41	1.32	4.27	.
	1990	94.12	.91	4.98	.
Bolivia	1950	55.62	27.66	16.71	1274
	1960	55.34	23.84	20.82	1148
	1970	55.05	20.02	24.93	1661
	1980	52.82	17.61	29.58	1989
	1990	46.84	17.52	35.64	1658
Bosnia Herzogov	1950	73.51	13.44	13.05	.
	1960	64.15	23.21	12.64	.
	1970	50.02	28.93	21.06	.
	1980	29.50	37.86	32.64	.
	1990	11.33	47.51	41.16	.
Botswana	1950	95.93	.55	3.52	.
	1960	92.71	1.93	5.36	535
	1970	81.52	5.23	13.25	823
	1980	63.89	10.02	26.09	1940
	1990	46.36	20.40	33.24	.
Brazil	1950	59.81	16.59	23.60	1265
	1960	52.06	18.36	29.59	1784
	1970	44.91	21.78	33.31	2434
	1980	36.68	23.93	39.39	4303
	1990	23.34	23.01	53.65	4042
Brunei	1950	44.06	35.33	20.61	.
	1960	34.21	34.97	30.83	.
	1970	12.55	33.49	53.97	.
	1980	5.09	31.14	63.77	.
	1990	2.04	24.40	73.56	.
Bulgaria	1950	72.77	13.45	13.78	.
	1960	56.64	24.54	18.82	.
	1970	34.76	37.75	27.49	.
	1980	20.18	44.80	35.02	3926
	1990	13.46	48.27	38.28	6203
Burkina_Faso	1950	91.85	2.47	5.68	.
	1960	91.85	2.55	5.60	456
	1970	92.00	2.68	5.32	374
	1980	92.17	2.78	5.05	457
	1990	92.38	1.81	5.80	511
Burundi	1950	95.72	1.48	2.80	.
	1960	94.66	1.85	3.49	640
	1970	93.54	2.12	4.34	341
	1980	92.84	2.37	4.79	480
	1990	91.65	2.71	5.64	550
Cambodia	1950	84.53	1.72	13.76	.
	1960	82.67	3.30	14.03	.
	1970	79.09	4.00	16.91	.
	1980	75.75	6.63	17.62	.
	1990	73.87	7.50	18.64	.
Cameroon	1950	92.05	2.84	5.11	.
	1960	89.25	3.71	7.04	641
	1970	84.93	4.83	10.24	804
	1980	73.19	7.86	18.95	1194
	1990	69.71	8.84	21.45	1226
Canada	1950	19.84	36.02	44.14	6380
	1960	13.19	34.54	52.27	7258
	1970	7.78	30.47	61.75	10124
	1980	6.66	33.49	59.85	14133
	1990	3.37	25.18	71.45	17173

NAME	YEAR	AG	IND	SERV	GNP
Cape Verde	1950	67.35	16.54	16.11	
	1960	57.03	21.60	21.37	469
	1970	46.73	26.60	26.67	634
	1980	36.68	30.74	32.58	934
	1990	30.59	29.68	39.73	1058
Central_African	1950	95.56	1.75	2.69	
	1960	93.44	1.97	4.59	704
	1970	89.08	2.45	8.47	747
	1980	84.66	2.96	12.38	706
	1990	80.20	3.50	16.30	579
Chad	1950	97.39	1.09	1.52	
	1960	95.51	1.82	2.67	756
	1970	93.32	2.47	5.21	660
	1980	87.88	3.39	8.73	528
	1990	83.22	4.20	12.58	399
Chile	1950	33.14	30.03	36.83	2431
	1960	30.46	30.44	39.11	2885
	1970	24.10	29.28	46.62	3605
	1980	20.89	25.35	53.76	3892
	1990	18.75	25.36	55.89	4338
China	1950	88.38	4.60	7.02	.
	1960	83.23	6.30	10.47	.
	1970	78.34	10.12	11.54	.
	1980	74.24	13.99	11.77	.
	1990	72.24	15.10	12.66	.
Colombia	1950	57.25	17.91	24.84	1503
	1960	50.16	19.48	30.37	1684
	1970	41.35	20.26	38.40	2140
	1980	40.48	21.44	38.08	2946
	1990	26.62	22.94	50.45	3300
Comoros	1950	88.65	4.67	6.68	
	1960	85.90	5.84	8.26	543
	1970	83.27	6.96	9.77	693
	1980	80.57	8.11	11.32	631
	1990	77.36	9.31	13.33	564
Congo	1950	70.36	9.79	19.85	
	1960	68.20	10.37	21.43	1123
	1970	66.12	10.90	22.98	1670
	1980	58.06	12.67	29.27	1931
	1990	48.72	14.66	36.32	2211
Costa_Rica	1950	57.53	16.67	25.80	1457
	1960	51.25	18.26	30.49	2096
	1970	42.60	20.00	37.41	2904
	1980	34.99	22.65	42.37	3717
	1990	26.03	26.77	47.20	3499
Cote_d'Ivoire	1950	89.74	2.50	7.76	
	1960	83.88	3.93	12.19	1120
	1970	76.60	5.89	18.51	1615
	1980	64.83	8.39	26.78	1790
	1990	59.94	9.57	30.49	1213
Croatia	1950	73.15	13.71	13.14	.
	1960	63.80	23.41	12.79	.
	1970	49.79	29.17	21.04	.
	1980	25.01	33.92	41.07	.
	1990	16.05	33.79	50.16	.
Cuba	1950	41.17	20.47	38.36	.
	1960	35.70	23.59	40.71	.
	1970	30.10	26.43	43.48	.
	1980	23.57	28.42	48.00	.
	1990	18.15	30.36	51.49	.
Cyprus	1950	47.99	24.04	27.97	1565
	1960	41.93	27.13	30.94	2037
	1970	38.44	27.86	33.70	3753
	1980	25.97	33.53	40.50	5295
	1990	13.56	30.02	56.42	8368
Czech Republic	1950	39.06	35.79	25.15	
	1960	25.60	46.17	28.22	1603
	1970	16.90	48.45	34.65	2520
	1980	13.05	55.96	30.99	3731
	1990	11.21	45.38	43.41	4095
Denmark	1950	25.70	33.59	40.72	5263
	1960	17.93	36.96	45.12	6760
	1970	11.18	36.98	51.85	9670
	1980	6.98	30.89	62.14	11342
	1990	5.56	28.16	66.29	13909

NAME	YEAR	AG	IND	SERV	GNP
Dominican_Repub	1950	72.64	11.23	16.13	949
	1960	63.63	12.73	23.63	1195
	1970	47.54	14.35	38.11	1536
	1980	32.48	23.67	43.85	2343
	1990	24.83	29.13	46.04	2166
Ecuador	1950	65.44	15.30	19.26	1194
	1960	58.88	18.10	23.02	1461
	1970	50.66	20.46	28.88	1789
	1980	39.81	20.25	39.95	3238
	1990	32.26	19.11	47.63	2755
Egypt,_Arab_Rep	1950	60.33	12.43	27.24	751
	1960	58.12	12.60	29.28	809
	1970	51.76	16.44	31.80	1163
	1980	57.14	15.69	27.17	1645
	1990	40.28	21.51	38.21	1912
El_Salvador	1950	65.30	15.45	19.25	1206
	1960	61.84	17.22	20.94	1427
	1970	56.84	14.31	28.85	1810
	1980	43.23	19.40	37.37	2014
	1990	36.32	20.70	42.98	1824
Equatorial Guin	1950	88.73	3.85	7.42	.
	1960	85.30	4.20	10.50	.
	1970	81.83	4.56	13.61	.
	1980	78.29	4.94	16.77	.
	1990	74.79	5.30	19.91	.
Eritrea	1950	89.20	3.30	7.50	.
	1960	87.49	3.51	9.00	.
	1970	85.78	3.92	10.30	.
	1980	83.12	4.54	12.34	.
	1990	80.47	4.98	14.55	.
Estonia	1950	41.64	26.91	31.45	.
	1960	28.35	36.28	35.37	.
	1970	17.82	43.38	38.80	.
	1980	15.26	43.28	41.46	.
	1990	14.41	41.30	44.29	.
Ethiopia	1950	95.01	1.39	3.60	221
	1960	93.10	1.56	5.34	257
	1970	91.20	1.74	7.06	296
	1980	89.31	1.91	8.78	322
	1990	86.18	2.09	11.73	.
Fiji	1950	66.80	17.32	15.88	.
	1960	59.51	17.25	23.24	2108
	1970	51.57	16.97	31.46	2592
	1980	47.42	15.89	36.69	3609
	1990	45.64	14.95	39.31	4007
Finland	1950	35.01	35.17	29.82	3506
	1960	27.42	35.47	37.11	5291
	1970	19.63	35.16	45.21	8108
	1980	12.05	34.58	53.37	10851
	1990	8.39	30.64	60.97	14059
France	1950	30.89	34.90	34.20	4045
	1960	22.10	38.70	39.20	5823
	1970	13.61	39.27	47.12	9200
	1980	8.26	34.61	57.13	11756
	1990	5.49	28.79	65.72	13904
Gabon	1950	90.33	4.66	5.01	.
	1960	85.33	6.37	8.30	1789
	1970	79.47	8.81	11.72	3704
	1980	65.49	12.14	22.37	4797
	1990	51.54	15.91	32.55	3958
Gambia,_The	1950	90.45	4.06	5.50	.
	1960	88.96	4.65	6.39	602
	1970	86.92	5.49	7.59	722
	1980	84.41	6.55	9.04	1017
	1990	81.89	7.60	10.51	799
Georgia	1950	61.04	16.64	22.32	.
	1960	48.71	20.57	30.72	.
	1970	36.94	25.57	37.49	.
	1980	32.28	26.73	40.99	.
	1990	26.03	31.43	42.54	.
Germany	1950	23.04	43.97	33.00	3421
	1960	15.01	47.72	37.27	6570
	1970	8.71	48.56	42.73	9425
	1980	6.94	45.38	47.68	11920
	1990	3.98	38.13	57.89	14341
Ghana	1950	71.98	9.17	18.85	.
	1960	63.25	13.68	23.07	894
	1970	60.46	14.53	25.01	1059
	1980	61.49	13.13	25.38	976
	1990	59.30	12.97	27.73	902

NAME	YEAR	AG	IND	SERV	GNP
Greece	1950	55.33	18.84	25.83	1409
	1960	52.16	21.20	26.64	2093
	1970	42.25	26.21	31.54	4224
	1980	31.22	28.52	40.25	5901
	1990	22.95	27.32	49.73	6768
Guadeloupe	1950	55.93	22.62	21.45	.
	1960	41.95	23.94	34.12	.
	1970	29.07	24.50	46.43	.
	1980	19.09	17.44	63.47	.
	1990	6.63	19.58	73.80	.
Guatemala	1950	68.39	13.82	17.80	1532
	1960	66.66	13.42	19.92	1660
	1970	61.72	16.98	21.30	2028
	1980	53.82	18.96	27.22	2574
	1990	52.41	17.46	30.13	2127
Guinea	1950	95.05	.73	4.22	.
	1960	93.57	.94	5.49	559
	1970	92.25	1.13	6.62	467
	1980	90.89	1.33	7.78	817
	1990	87.18	1.88	10.94	767
Guinea-Bissau	1950	92.91	.84	6.25	.
	1960	91.10	1.09	7.81	503
	1970	89.29	1.35	9.36	699
	1980	87.48	1.59	10.93	471
	1990	85.34	1.85	12.81	689
Guyana	1950	44.04	25.96	30.00	.
	1960	38.01	27.29	34.70	.
	1970	31.91	28.52	39.57	.
	1980	26.62	25.72	47.66	.
	1990	21.84	24.71	53.45	.
Haiti	1950	85.61	5.70	8.70	.
	1960	79.93	6.41	13.66	924
	1970	74.41	7.12	18.47	834
	1980	70.94	8.10	20.96	1033
	1990	67.80	8.78	23.42	.
Honduras	1950	72.36	8.78	18.86	981
	1960	70.35	10.52	19.13	1039
	1970	65.12	14.05	20.84	1237
	1980	57.18	14.77	28.05	1519
	1990	41.40	19.62	38.98	1377
Hong Kong	1950	12.12	55.68	32.20	.
	1960	7.77	51.62	40.61	2247
	1970	4.36	54.87	40.78	4502
	1980	1.32	49.75	48.93	8719
	1990	.89	36.83	62.28	14849
Hungary	1950	51.77	23.74	24.49	.
	1960	38.02	34.94	27.03	.
	1970	25.13	44.85	30.02	3358
	1980	18.42	43.45	38.13	4992
	1990	15.22	37.85	46.93	5357
Iceland	1950	36.52	31.79	31.69	3808
	1960	24.67	36.27	39.05	4964
	1970	17.94	38.16	43.90	6772
	1980	10.31	36.98	52.72	11566
	1990	10.97	26.51	62.52	13362
India	1950	78.90	8.22	12.88	590
	1960	74.32	10.98	14.70	766
	1970	70.63	12.69	16.68	802
	1980	69.53	13.06	17.41	882
	1990	64.02	16.02	19.97	1264
Indonesia	1950	79.01	6.34	14.65	.
	1960	74.80	7.64	17.57	638
	1970	66.30	10.26	23.44	715
	1980	57.82	12.08	30.09	1281
	1990	55.18	13.61	31.22	1974
Iran	1950	61.22	18.79	19.98	.
	1960	53.98	23.18	22.84	2946
	1970	43.76	29.18	27.07	4796
	1980	45.63	23.88	30.49	3434
	1990	38.76	22.53	38.71	3392
Iraq	1950	57.97	16.32	25.72	.
	1960	53.13	18.24	28.63	3427
	1970	47.07	21.85	31.08	4409
	1980	28.46	21.27	50.27	7242
	1990	16.10	17.50	66.39	.
Ireland	1950	40.21	24.63	35.16	2730
	1960	36.58	24.69	38.73	3311
	1970	26.36	30.99	42.65	5015
	1980	18.57	33.81	47.61	6823
	1990	14.34	28.63	57.03	9274

NAME	YEAR	AG	IND	SERV	GNP
Israel	1950	18.47	33.23	48.30	.
	1960	14.40	35.12	50.48	3477
	1970	9.67	35.60	54.74	6004
	1980	6.11	31.91	61.97	7895
	1990	4.13	29.07	66.80	9298
Italy	1950	43.97	31.03	25.00	2743
	1960	30.80	39.38	29.83	4564
	1970	18.79	43.58	37.62	7568
	1980	12.61	37.53	49.87	10323
	1990	8.60	31.41	59.99	12488
Jamaica	1950	47.18	22.87	29.95	.
	1960	41.52	21.66	36.82	1773
	1970	33.06	17.93	49.02	2645
	1980	31.20	16.34	52.46	2362
	1990	24.76	23.29	51.95	2545
Japan	1950	48.83	23.63	27.53	1430
	1960	33.06	29.48	37.46	2954
	1970	19.64	34.50	45.86	7307
	1980	10.95	34.64	54.41	10072
	1990	7.28	34.21	58.51	14331
Jordan	1950	54.46	25.62	19.92	.
	1960	45.44	25.90	28.66	1162
	1970	27.83	25.89	46.28	1422
	1980	17.83	23.66	58.51	3384
	1990	15.27	23.46	61.28	2919
Kazakhstan	1950	54.29	19.34	26.36	.
	1960	37.52	24.19	38.29	.
	1970	26.86	30.26	42.88	.
	1980	24.41	31.66	43.93	.
	1990	22.19	31.52	46.29	.
Kenya	1950	90.19	3.88	5.93	590
	1960	87.88	4.52	7.60	659
	1970	85.74	5.24	9.02	586
	1980	82.22	6.33	11.45	911
	1990	79.52	7.26	13.22	911
Korea, _DPR	1950	70.92	14.91	14.17	.
	1960	63.98	19.30	16.72	.
	1970	54.80	24.42	20.78	.
	1980	44.91	29.05	26.04	.
	1990	38.10	31.37	30.54	.
Korea,_Republic	1950	76.90	6.39	16.71	.
	1960	61.32	10.20	28.48	904
	1970	49.14	19.82	31.04	1680
	1980	37.12	26.53	36.35	3093
	1990	18.11	35.36	46.53	6673
Kuwait	1950	1.94	34.01	64.05	.
	1960	1.45	34.12	64.43	.
	1970	1.75	34.00	64.24	.
	1980	1.89	31.54	66.57	20018
	1990	1.17	25.15	73.67	.
Kyggyzstan	1950	69.20	12.16	18.64	.
	1960	49.86	21.81	28.34	.
	1970	35.59	29.58	34.83	.
	1980	33.72	28.80	37.48	.
	1990	32.10	26.69	41.22	.
Laos	1950	83.94	3.10	12.97	.
	1960	82.47	3.90	13.63	.
	1970	81.01	4.71	14.29	.
	1980	79.55	5.50	14.95	.
	1990	78.14	6.28	15.58	1385
Latvia	1950	48.46	23.55	27.99	.
	1960	34.74	32.86	32.40	.
	1970	19.14	42.58	38.28	.
	1980	16.32	42.31	41.37	.
	1990	15.78	39.76	44.45	.
Lebanon	1950	55.11	20.39	24.50	.
	1960	38.27	22.97	38.76	.
	1970	19.78	25.20	55.02	.
	1980	14.28	27.34	58.38	.
	1990	7.29	30.98	61.74	.
Lesotho	1950	51.83	30.17	18.00	.
	1960	47.44	33.16	19.40	313
	1970	42.71	36.04	21.25	419
	1980	40.41	34.00	25.59	994
	1990	40.07	27.85	32.08	972

NAME	YEAR	AG	IND	SERV	GNP
Liberia	1950	84.22	7.88	7.90	.
	1960	82.68	8.60	8.72	717
	1970	80.59	7.15	12.26	982
	1980	76.39	6.12	17.49	927
	1990	72.25	5.57	22.18	.
Libya	1950	74.86	9.17	15.97	.
	1960	53.06	16.65	30.29	16673
	1970	28.88	25.05	46.07	16673
	1980	24.87	23.79	51.34	13224
	1990	10.89	22.95	66.16	.
Lithuania	1950	66.81	12.88	20.31	.
	1960	52.39	22.24	25.37	.
	1970	31.42	36.95	31.63	.
	1980	27.84	38.23	33.93	.
	1990	18.48	40.58	40.93	.
Luxembourg	1950	24.03	40.40	35.57	6534
	1960	15.47	43.92	40.61	7921
	1970	7.91	43.61	48.48	9782
	1980	5.36	34.89	59.74	11893
	1990	3.61	26.98	69.41	16280
Macedonia	1950	73.03	13.84	13.13	.
	1960	63.60	23.56	12.84	.
	1970	49.72	29.25	21.03	.
	1980	36.04	32.64	31.32	.
	1990	21.52	40.35	38.14	.
Madagascar	1950	87.99	3.37	8.64	.
	1960	86.15	4.06	9.79	1191
	1970	84.30	4.75	10.95	1146
	1980	81.64	5.63	12.73	984
	1990	78.19	6.75	15.06	675
Malawi	1950	95.61	1.84	2.55	.
	1960	93.59	2.64	3.77	380
	1970	91.45	3.73	4.82	440
	1980	87.26	5.37	7.37	554
	1990	86.64	4.92	8.44	519
Malaysia	1950	67.35	10.13	22.52	.
	1960	63.26	11.68	25.06	1420
	1970	53.74	14.28	31.98	2154
	1980	40.78	18.76	40.45	3799
	1990	27.34	23.14	49.52	5124
Maldives	1950	74.52	14.84	10.64	.
	1960	70.07	17.38	12.55	.
	1970	65.56	20.05	14.40	.
	1980	50.13	29.02	20.85	.
	1990	32.31	31.01	36.68	.
Mali	1950	94.99	.69	4.32	.
	1960	93.83	.82	5.35	535
	1970	92.69	1.02	6.29	419
	1980	89.02	1.60	9.38	532
	1990	85.80	1.97	12.23	531
Malta	1950	12.76	31.44	55.80	.
	1960	9.46	41.44	49.10	1374
	1970	7.02	42.32	50.66	2424
	1980	8.19	49.94	41.87	4483
	1990	2.57	34.58	62.85	.
Martinique	1950	47.09	20.67	32.23	.
	1960	40.85	21.47	37.68	.
	1970	25.23	20.20	54.57	.
	1980	13.01	17.66	69.33	.
	1990	7.49	17.05	75.46	.
Mauritania	1950	96.56	.89	2.55	.
	1960	92.16	1.62	6.22	780
	1970	84.35	3.33	12.32	872
	1980	71.51	6.69	21.80	885
	1990	55.20	10.40	34.40	791
Mauritius	1950	47.16	22.74	30.10	3295
	1960	39.62	25.64	34.74	2862
	1970	34.04	25.07	40.89	2398
	1980	27.15	27.61	45.24	3988
	1990	16.71	43.18	40.11	5838
Mexico	1950	60.36	16.81	22.83	2198
	1960	55.10	19.45	25.45	2836
	1970	43.81	24.22	31.97	3987
	1980	36.32	29.09	34.60	6054
	1990	27.92	23.76	48.33	5827
Moldova	1950	81.22	6.01	12.77	.
	1960	72.06	10.47	17.47	.
	1970	54.31	21.19	24.50	.
	1980	43.20	26.09	30.71	.
	1990	32.99	29.90	37.11	.

NAME	YEAR	AG	IND	SERV	GNP
Mongolia	1950	68.63	17.00	14.37	.
	1960	60.82	19.00	20.18	.
	1970	47.81	21.00	31.19	.
	1980	39.80	21.00	39.20	.
	1990	32.00	22.54	45.46	1842
Morocco	1950	71.16	8.73	20.11	821
	1960	65.72	12.45	21.83	815
	1970	57.63	16.98	25.39	1342
	1980	56.01	20.29	23.80	1941
	1990	44.67	24.81	30.52	2151
Mozambique	1950	89.98	3.79	6.23	.
	1960	88.12	5.01	6.87	1153
	1970	86.22	6.24	7.54	1497
	1980	84.27	7.48	8.25	923
	1990	82.73	8.02	9.25	760
Myanmar	1950	83.52	3.44	13.04	228
	1960	80.97	5.03	14.00	316
	1970	78.39	6.63	14.98	418
	1980	75.81	8.23	15.97	505
	1990	73.27	9.83	16.90	.
Namibia	1950	75.45	11.07	13.48	3295
	1960	71.05	13.43	15.52	2862
	1970	63.75	15.05	21.20	2398
	1980	56.42	15.02	28.56	3988
	1990	49.08	15.39	35.53	5838
Nepal	1950	95.22	2.54	2.24	.
	1960	94.99	2.05	2.95	628
	1970	94.42	1.29	4.29	670
	1980	93.77	.52	5.70	892
	1990	93.59	.25	6.17	.
Netherlands	1950	17.68	36.23	46.10	4532
	1960	10.76	42.47	46.77	6077
	1970	6.82	39.41	53.77	9199
	1980	5.56	31.30	63.14	11284
	1990	4.57	25.64	69.79	13029
Netherlands Ant	1950	3.14	55.37	41.49	.
	1960	2.09	42.70	55.21	.
	1970	1.09	30.82	68.08	.
	1980	.41	21.03	78.56	.
	1990	.68	20.10	79.22	.
New_Zealand	1950	18.80	34.63	46.57	6667
	1960	14.77	36.61	48.62	7960
	1970	11.85	35.69	52.45	9392
	1980	11.22	32.57	56.21	10362
	1990	10.36	24.88	64.76	11513
Nicaragua	1950	67.92	15.18	16.91	1152
	1960	61.81	16.01	22.18	1606
	1970	49.97	17.76	32.27	2359
	1980	39.49	24.24	36.27	1853
	1990	27.71	26.28	46.02	1294
Niger	1950	95.58	1.13	3.29	.
	1960	94.20	1.53	4.27	532
	1970	92.79	2.31	4.90	805
	1980	91.36	3.26	5.38	717
	1990	89.91	3.94	6.15	.
Nigeria	1950	77.24	7.47	15.29	456
	1960	73.15	9.88	16.97	567
	1970	70.96	10.51	18.53	767
	1980	53.95	8.28	37.77	1438
	1990	43.01	6.91	50.08	995
Norway	1950	26.35	36.68	36.97	4358
	1960	19.83	36.67	43.50	5610
	1970	11.77	36.94	51.29	8034
	1980	8.26	29.13	62.60	12141
	1990	6.28	25.31	68.41	14902
Oman	1950	76.36	8.69	14.95	.
	1960	67.34	12.36	20.29	.
	1970	56.91	17.62	25.47	6633
	1980	50.04	21.87	28.09	6521
	1990	44.51	23.84	31.65	.
Pakistan	1950	68.81	13.55	17.64	602
	1960	60.84	17.87	21.28	638
	1970	58.84	18.73	22.43	1029
	1980	59.84	14.58	25.58	1110
	1990	51.80	18.53	29.67	1394
Panama	1950	56.42	13.59	29.99	1309
	1960	51.06	13.96	34.97	1575
	1970	41.62	17.54	40.84	2584
	1980	28.93	19.44	51.63	3392
	1990	26.18	16.06	57.77	2888

NAME	YEAR	AG	IND	SERV	GNP
Papua_New_Guine	1950	92.83	3.37	3.80	.
	1960	89.56	4.02	6.41	1235
	1970	86.25	4.70	9.04	1896
	1980	82.44	5.78	11.78	1779
	1990	79.19	6.52	14.29	1425
Paraguay	1950	55.98	19.53	24.49	1253
	1960	56.64	18.88	24.48	1177
	1970	53.10	19.47	27.43	1394
	1980	44.88	20.10	35.02	2534
	1990	39.02	22.04	38.94	2128
Peru	1950	57.68	18.23	24.09	1504
	1960	52.32	20.04	27.64	2019
	1970	48.27	17.50	34.24	2736
	1980	40.30	18.33	41.36	2875
	1990	35.66	17.85	46.49	2188
Philippines	1950	71.11	11.67	17.23	778
	1960	63.65	14.18	22.17	1133
	1970	57.91	14.82	27.29	1403
	1980	52.30	15.06	32.64	1879
	1990	45.76	15.34	38.90	1763
Poland	1950	57.77	23.05	19.18	.
	1960	48.08	28.85	23.07	.
	1970	38.91	34.23	26.86	2941
	1980	29.79	37.70	32.50	4419
	1990	27.47	35.84	36.69	3820
Portugal	1950	49.76	24.29	25.94	1208
	1960	44.02	28.97	27.01	1869
	1970	31.75	31.76	36.49	3306
	1980	26.04	36.23	37.73	4982
	1990	17.82	34.01	48.17	7478
Puerto Rico	1950	36.87	27.09	36.04	.
	1960	25.41	29.29	45.30	3102
	1970	13.75	31.17	55.08	5780
	1980	5.79	28.66	65.55	6924
	1990	4.36	26.46	69.17	.
Qatar	1950	29.40	21.41	49.19	.
	1960	17.50	23.81	58.69	.
	1970	9.67	26.36	63.97	.
	1980	2.81	28.07	69.12	33946
	1990	2.66	31.99	65.35	.
Reunion	1950	58.11	16.85	25.04	.
	1960	45.40	20.96	33.64	1092
	1970	37.24	20.51	42.25	1960
	1980	29.10	21.32	49.58	2827
	1990	6.77	18.27	74.96	.
Romania	1950	72.11	14.74	13.16	.
	1960	64.42	20.47	15.12	431
	1970	48.70	31.09	20.21	809
	1980	34.81	40.67	24.52	1422
	1990	23.96	47.21	28.83	.
Russian Federat	1950	39.55	31.82	28.63	.
	1960	30.43	35.55	34.02	.
	1970	18.91	42.67	38.42	.
	1980	16.03	43.74	40.22	.
	1990	13.71	41.71	44.57	.
Rwanda	1950	95.72	1.77	2.51	.
	1960	94.71	2.16	3.13	537
	1970	93.62	2.62	3.76	647
	1980	92.76	2.96	4.28	757
	1990	91.71	3.39	4.90	756
Saudi Arabia	1950	76.34	8.81	14.85	.
	1960	71.18	9.77	19.05	3884
	1970	64.18	12.09	23.73	7838
	1980	43.48	15.63	40.89	13750
	1990	19.22	19.76	61.01	.
Senegal	1950	84.98	4.98	10.04	.
	1960	83.84	5.30	10.86	1047
	1970	82.70	5.65	11.65	1146
	1980	80.73	6.20	13.07	1134
	1990	76.72	7.51	15.77	1145
Sierra_Leone	1950	85.58	7.22	7.20	.
	1960	81.35	9.40	9.25	.
	1970	75.52	12.36	12.12	1435
	1980	69.76	13.94	16.30	1139
	1990	67.44	15.31	17.25	901
Singapore	1950	8.21	20.40	71.39	.
	1960	7.40	23.06	69.54	1658
	1970	3.43	30.25	66.31	3017
	1980	1.56	41.65	56.79	7053
	1990	.37	35.70	63.94	11710

NAME	YEAR	AG	IND	SERV	GNP
Slovakia	1950	39.24	35.64	25.12	.
	1960	25.66	46.05	28.29	1603
	1970	16.90	48.42	34.68	2520
	1980	13.74	35.87	50.39	3731
	1990	12.09	33.31	54.61	4095
Slovenia	1950	73.15	13.71	13.14	.
	1960	63.79	23.42	12.79	.
	1970	49.80	29.17	21.04	.
	1980	15.44	43.41	41.14	.
	1990	5.69	46.15	48.16	.
Solomon Islands	1950	87.12	2.97	9.91	.
	1960	84.57	3.72	11.76	.
	1970	81.81	4.57	13.72	.
	1980	79.24	6.21	14.55	1603
	1990	76.52	7.12	16.36	.
Somalia	1950	87.21	4.07	8.72	.
	1960	84.26	5.10	10.64	1103
	1970	81.31	6.14	12.55	921
	1980	78.33	7.20	14.47	744
	1990	75.32	8.24	16.44	.
South_Africa	1950	38.13	26.43	35.44	1941
	1960	37.52	27.46	35.02	2191
	1970	30.97	29.77	39.26	3254
	1980	17.29	34.66	48.05	3496
	1990	13.54	31.96	54.50	3248
Spain	1950	50.10	25.17	24.73	1913
	1960	42.09	31.41	26.50	3123
	1970	26.00	37.56	36.44	5861
	1980	18.44	36.66	44.90	7390
	1990	11.86	32.67	55.47	9583
Sri_Lanka	1950	58.05	12.32	29.63	1058
	1960	56.57	13.40	30.03	1259
	1970	55.27	14.41	30.32	1243
	1980	51.87	17.79	30.35	1635
	1990	48.49	20.89	30.62	2096
Sudan	1950	92.10	2.01	5.89	.
	1960	85.92	3.63	10.45	.
	1970	76.94	5.96	17.10	817
	1980	72.17	7.97	19.86	866
	1990	69.47	8.45	22.08	757
Surinam	1950	30.85	21.28	47.87	.
	1960	29.06	21.82	49.12	.
	1970	26.72	21.88	51.41	.
	1980	23.74	19.50	56.76	.
	1990	21.27	17.76	60.97	.
Swaziland	1950	82.66	5.49	11.85	.
	1960	75.16	8.46	16.38	1092
	1970	64.94	12.75	22.31	1960
	1980	49.98	18.64	31.38	2827
	1990	39.48	23.32	38.20	.
Sweden	1950	20.79	40.85	38.40	5807
	1960	14.10	45.25	40.65	7592
	1970	8.31	40.46	51.23	10766
	1980	6.17	34.48	59.35	12456
	1990	4.41	29.72	65.86	14762
Switzerland	1950	16.89	46.46	36.65	6813
	1960	11.29	50.19	38.53	9409
	1970	7.78	48.48	43.74	12942
	1980	6.17	39.12	54.71	14301
	1990	5.52	34.68	59.81	16505
Syrian_Arab_Rep	1950	58.41	17.48	24.11	.
	1960	54.21	19.03	26.76	1575
	1970	50.19	20.66	29.16	2294
	1980	38.71	28.05	33.24	4467
	1990	33.20	23.95	42.85	3897
Taiwan[1]	1950	.	.	.	.
	1960	.	.	.	1256
	1970	36.70	27.90	29.90	2188
	1980	19.50	42.50	32.90	4459
	1990	12.80	44.50	41.00	8063
Tajikistan	1950	74.46	8.96	16.58	.
	1960	59.85	16.22	23.93	.
	1970	46.34	21.86	31.79	.
	1980	44.50	22.90	32.60	.
	1990	40.68	23.41	35.92	.

[1] Employment data rather than labour force, from country statistical yearbook.

NAME	YEAR	AG	IND	SERV	GNP
Tanzania	1950	94.14	1.91	3.95	.
	1960	92.59	2.39	5.02	319
	1970	90.06	3.18	6.76	424
	1980	85.78	4.46	9.76	480
	1990	84.40	4.90	10.70	.
Thailand	1950	85.63	2.79	11.58	857
	1960	83.70	4.39	11.91	943
	1970	79.81	6.00	14.18	1526
	1980	70.91	10.25	18.84	2178
	1990	64.06	13.99	21.95	3580
Togo	1950	83.39	7.62	8.99	.
	1960	80.17	8.05	11.78	367
	1970	74.46	8.86	16.68	618
	1980	68.75	9.67	21.58	731
	1990	65.56	10.07	24.37	641
Trinidad and To	1950	24.68	33.34	41.98	3046
	1960	21.77	34.25	43.98	5627
	1970	18.56	35.27	46.17	6795
	1980	10.91	38.72	50.37	11262
	1990	11.04	31.56	57.41	7764
Tunisia	1950	67.67	13.86	18.47	.
	1960	55.78	17.99	26.23	1101
	1970	41.88	25.58	32.54	1442
	1980	38.89	30.27	30.84	2527
	1990	28.14	32.79	39.07	2910
Turkey	1950	87.00	6.42	6.58	1065
	1960	78.72	10.39	10.89	1622
	1970	70.69	11.89	17.41	2202
	1980	60.33	15.91	23.77	2874
	1990	53.07	18.29	28.63	3741
Turkmenistan	1950	58.79	16.32	24.89	.
	1960	46.85	20.32	32.83	.
	1970	37.80	24.24	37.96	.
	1980	39.00	24.42	36.58	.
	1990	37.23	22.83	39.94	.
Uganda	1950	94.73	1.80	3.47	543
	1960	92.71	2.33	4.96	598
	1970	89.95	3.15	6.90	647
	1980	87.09	4.03	8.88	534
	1990	84.53	4.73	10.74	554
Ukraine	1950	59.49	20.76	19.75	.
	1960	47.50	25.85	26.65	.
	1970	30.80	36.59	32.61	.
	1980	24.78	39.33	35.89	.
	1990	19.99	39.78	40.24	.
United Arab Emi	1950	44.15	23.76	32.10	.
	1960	28.79	29.32	41.89	.
	1970	8.80	39.46	51.74	.
	1980	4.56	38.13	57.31	31969
	1990	7.78	26.78	65.45	.
United_Kingdom	1950	5.48	49.49	45.03	5395
	1960	4.01	47.73	48.25	6823
	1970	2.81	45.14	52.05	8537
	1980	2.60	37.95	59.45	10167
	1990	2.17	29.15	68.68	13217
United_States	1950	12.30	36.68	51.03	8772
	1960	6.64	36.57	56.79	9895
	1970	4.29	32.46	63.26	12963
	1980	3.46	31.02	65.52	15295
	1990	2.87	26.27	70.86	18054
Uruguay	1950	24.35	28.00	47.65	3451
	1960	21.29	28.84	49.86	3968
	1970	18.68	29.06	52.26	4121
	1980	16.65	28.15	55.20	5091
	1990	14.25	27.17	58.58	4602
Uzbekistan	1950	70.98	11.90	17.12	.
	1960	56.82	18.04	25.13	.
	1970	44.42	23.05	32.53	.
	1980	40.03	26.33	33.64	.
	1990	34.94	25.09	39.97	.
Venezuela	1950	42.87	21.38	35.74	4799
	1960	33.37	22.44	44.19	6338
	1970	26.01	24.84	49.15	7753
	1980	14.57	27.82	57.61	7401
	1990	12.02	27.31	60.67	6055
Viet Nam	1950	83.34	3.34	13.32	.
	1960	81.51	4.88	13.61	.
	1970	76.60	6.49	16.91	.
	1980	73.20	13.18	13.63	.
	1990	71.30	14.01	14.70	.

NAME	YEAR	AG	IND	SERV	GNP
Yemen,_Republic	1950	80.66	6.54	12.80	.
	1960	76.24	7.68	16.08	.
	1970	70.43	8.80	20.78	879
	1980	72.55	13.22	14.23	1313
	1990	60.95	16.83	22.22	.
Yugoslavia,_Fed	1950	73.11	13.77	13.11	.
	1960	63.61	23.52	12.86	1921
	1970	49.75	29.22	21.03	3297
	1980	39.03	28.97	32.00	5565
	1990	29.70	33.09	37.21	4548
Zaire	1950	83.15	7.90	8.95	332
	1960	79.30	9.29	11.41	489
	1970	75.44	10.68	13.88	686
	1980	71.64	12.03	16.33	476
	1990	67.79	13.40	18.81	.
Zambia	1950	88.97	4.53	6.50	.
	1960	84.57	5.73	9.70	965
	1970	79.05	7.08	13.87	1117
	1980	76.11	8.10	15.79	971
	1990	74.60	8.48	16.92	689
Zimbabwe	1950	85.03	5.87	9.10	.
	1960	80.77	9.77	9.46	989
	1970	76.60	11.12	12.28	1082
	1980	72.40	12.26	15.34	1206
	1990	68.17	8.29	23.54	1182

APPENDIX III:

Benchmark Years for Type Definitions

Name	Code	Type	Notes	Mfg Peak	Ind. 30%	Ind. 20%	Ind. 10%	Ag. 20%	Ag. 35%	Ag. 60%	Total
Albania	ALB	SIC2				1967				1977	2
Algeria	DZA	NIC4			1986	1969	1953		1981	1963	5
Argentina	ARG	NIC0		1975	*1948*	*1904*		1961			3
Armenia	ARM	NIC2			1963			1982	1965		3
Australia	AUS	OIC		1954	1906			*1932*			3
Austria	AUT	OIC		1973	*1916*	*1880*		1964	*1948*		5
Azerbaijan	AZE	SIC							1970		1
Bahamas	BHS	SIC						1960			1
Bahrain	BHR	NIC0									0
Bangladesh	BGD	RIC					1982				1
Barbados	BRB	NIC1		1983	1962			1967			2
Belarus	BLR	NIC2			1967	1959		1989	1970	1957	5
Belgium	BEL	OIC		*1947*[2]				*1948*	*1886*		3
Belize	BLZ	SIC							1987		1
Bolivia	BOL	SIC2									0
Bosnia_Herzogov	BIH	NIC3			1971	1957		1985	1977	1963	5
Botswana	BWA	SIC2				1990	1979			1982	3
Brazil	BRA	SIC	NIC status?	1978		1964			1981	1950	4
Brunei	BRN	NIC1						1967	1959		2
Bulgaria	BGR	NIC2			1964	1956		1981	1970	1958	5
Canada	CAN	OIC		1950	*1942*			1950	*1923*		4
Cape_Verde	CPV	NIC3			1977	1956			1982	1957	4
Chile	CHL	NIC0		1967	1950			1982	*1941*		3
China	CHN	RIC					1969				1
Colombia	COL	SIC				1961			1984		2
Congo	COG	SIC2					1950			1977	2
Costa_Rica	CRI	SIC				1968			1980		2
Cote_d'Ivoire	CIV	SIC2					1990			1989	2
Croatia	HRV	NIC3			1971	1956		1986	1976	1963	5
Cuba	CUB	NIC4			1986			1986	1961		3
Cyprus	CYP	NIC2	rising?	1982	1973			1985	1973		4
Czech Republic	CZE	NIC0	68-73?	1973nu[3]				1966	1953		3
Denmark	DNK	OIC		1963	*1936*			1957	*1930*	*1850*	5
Dominican_Repub	DOM	SIC				1976			1978	1962	3
Ecuador	ECU	SIC				1966			1986	1958	3
Egypt,_Arab_Rep	EGY	SIC2				1987				1950	2
El_Salvador	SLV	SIC2				1981				1963	2

[2] Data for 1950 are used for Belgium throughout, since data for 1947 are harder to find.

[3] Not used in the final analysis; lack of GDP share data.

Name	Code	Type	Notes	Mfg Peak	Ind. 30%	Ind. 20%	Ind. 10%	Ag. 20%	Ag. 35%	Ag. 60%	Total
Estonia	EST	NIC1			1953			1968	1955		3
Fiji	FJI	SIC2								1959	1
Finland	FIN	OIC		1974				1970	1950	*1936*	4
France	FRA	OIC		1974	*1907*			1962	*1947*		4
Gabon	GAB	SIC2					1973			1984	2
Georgia	GEO	NIC4			1986	1958			1974	1951	4
Germany	DEU	OIC		1970				1954	*1911*		3
Ghana	GHA	SIC2					1951			1970	2
Greece	GRC	NIC3		1986		1953			1977		3
Guadeloupe	GLP	SIC						1978	1965		2
Guatemala	GTM	SIC2								1972	1
Guyana	GUY	SIC		1970					1965		1
Honduras	HND	SIC2				1990	1955			1976	3
Hong_Kong	HKG	NIC0	UNIDO data	1981nu[4]							1
Hungary	HUN	NIC1		1969nu	1956			1977	1962		4
Iceland	ISL	NIC0	flat	1971nu[5]				1967	1954		3
India	IND	RIC					1955				1
Indonesia	IDN	SIC2					1968			1977	2
Iran	IRN	SIC2			1970	1952				1952	3
Iraq	IRQ	SIC				1964		1987	1976		3
Ireland	IRL	NIC2		1974	1968			1978	1962		4
Israel	ISR	NIC0		1965							1
Italy	ITA	NIC1		1974				1969	1957		3
Jamaica	JAM	SIC							1968		1
Japan	JPN	NIC1		1973	1961			1970	1959		4
Jordan	JOR	SIC				1951		1978	1966		3
Kazakhstan	KAZ	NIC2			1969	1951			1962		3
Korea_DPR	PRK	SIC2			1982	1961				1964	3
Korea_Republic	KOR	NIC3		1989	1984	1970	1959	1989	1981	1961	7
Kuwait	KWT	NIC0									0
Kyggyzstan	KGZ	NIC2		1977	1970	1958			1971	1955	4
Latvia	LVA	NIC1			1957			1969	1960		3
Lebanon	LBN	NIC4			1986	1950		1970	1962		4
Lesotho	LSO	SIC2									0
Libya	LBY	SIC				1964	1951	1983	1967	1957	5
Lithuania	LTU	NIC2			1965	1958		1988	1968	1955	5
Luxembourg	LUX	NIC0	midpoint	1968				1955			2
Macedonia	MKD	NIC3			1971	1956			1981	1963	4
Malaysia	MYS	SIC				1982	1950		1984	1963	4
Maldives	MDV	NIC4			1983	1968			1988	1974	4
Malta	MLT	NIC0		1979							1
Martinique	MTQ	SIC						1974	1964		2

4 Not used due to contradictory information. Industrial labour force data show a decline from 1950.

5 Not used due to the existence of negative values for service share in World Bank data.

Name	Code	Type	Notes	Mfg Peak	Ind. 30%	Ind. 20%	Ind. 10%	Ag. 20%	Ag. 35%	Ag. 60%	Total
Mauritania	MRT	SIC2					1988			1987	2
Mauritius	MUS	NIC3		1988	1982			1987	1968		3
Mexico	MEX	NIC3	ILO 1995 data	1980		1961			1981	1950	3
Moldova	MDA	NIC4			1989	1969	1958		1988	1967	5
Mongolia	MNG	SIC				1963			1986	1961	3
Morocco	MAR	SIC2				1978	1953			1967	3
Namibia	NAM	SIC2								1975	1
Netherlands	NLD	OIC		1954	*1891*			*1932*	*1872*		4
Netherlands_Antilles	ANT	NIC0									0
New_Zealand	NZL	OIC		1965	*1946*			*1942*	*1899*		4
Nicaragua	NIC	SIC				1973			1984	1961	3
Norway	NOR	OIC		1965	*1938*	*1884*		1959	*1930*		5
Oman	OMN	SIC2				1975	1953			1967	3
Pakistan	PAK	SIC2								1962	1
Panama	PAN	SIC		1980					1975		1
Paraguay	PRY	SIC2				1971					1
Peru	PER	SIC2				1958					1
Philippines	PHL	SIC2								1966	1
Poland	POL	NIC2		1977nu	1962				1974		3
Portugal	PRT	NIC2		1985	1960			1987	1967		4
Puerto_Rico	PRI	NIC1		1969	1962			1965	1952		4
Qatar	QAT	NIC3			1984			1958			2
Reunion	REU	SIC				1957		1984	1973		3
Romania	ROM	NIC3			1969	1959			1980	1963	4
Russian_Federat	RUS	NIC1						1969	1955		2
Saudi Arabia	SAU	SIC				1990	1958	1990	1983	1972	5
Singapore	SGP	NIC2		1981	1969						2
Slovakia	SVK	NIC0						1966	1953		2
Slovenia	SVN	NIC2				1956		1979	1974	1963	4
South_Africa	ZAF	NIC2	UNIDO/ILO95	1980	1969			1978	1964		4
Spain	ESP	NIC2		1975	1957			1978	1965		4
Sri_Lanka	LKA	SIC2				1986					1
Surinam	SUR	SIC	ILO 1995 data	1970							0
Swaziland	SWZ	SIC2				1982	1963			1973	3
Sweden	SWE	OIC		1963	*1918*	*1889*	*1878*	1951	*1931*	*1896*	7
Switzerland	CHE	OIC	midpoint	1965				*1942*	*1900*		3
Syrian_Arab_Rep	SYR	NIC4		1981		1963			1986		2
Taiwan	TAI	NIC2	National source	1987	1971			1980	1971		4
Tajikistan	TJK	SIC2				1966	1951			1960	3
Thailand	THA	RIC					1979				1
Trinidad_and_To	TTO	NIC0		1980				1964			2
Tunisia	TUN	NIC3			1979	1962			1984	1956	4
Turkey	TUR	SIC2					1958			1980	2
Turkmenistan	TKM	SIC2				1958					1
Ukraine	UKR	NIC2			1964			1989	1967		3
United_Arab_Emirates	ARE	NIC1	ILO data	1970	1961			1964	1956		3

Name	Code	Type	Notes	Mfg Peak	Ind. 30%	Ind. 20%	Ind. 10%	Ag. 20%	Ag. 35%	Ag. 60%	Total
United_Kingdom	GBR	OIC		1955				*1856*			2
United_States	USA	OIC		1953	*1897*	*1859*		*1934*	*1904*	*1858*	6
Uruguay	URY	NIC2	Hat@28-29%	1979	1970			1964			2
Uzbekistan	UZB	SIC				1963			1989	1958	3
Venezuela	VEN	SIC						1975	1958		2
Yugoslavia_Fed	YUG	NIC4			1982	1956			1984	1963	4

Notes:

1. Benchmark years in italics are from historical data.
2. Hong Kong Data for the manufacturing peak are from one source only: UNIDO estimates in *World*Data 1995*.

APPENDIX IV:

Manufacturing Peak Data, Source and Survey Type

COUNTRY	CONT	TYPE	before 1945	1946 to 1955	1956 to 1965	1966 to 75	1976 to 1985	1986 to 1995+
Algeria	AF	NIC4						
Botswana	AF	SIC					1d: employees	
Cape Verde	AF	NIC3						
Congo	AF	SIC						
Cote_d'Ivoire	AF	SIC						
Egypt,_Arab_Rep	AF	SIC			1a: all	1e: all	1a: all	1a: all
Gabon	AF	SIC			1b: employees	1b: employees	1b: insured	
Ghana	AF	SIC					1d: employees	
Lesotho	AF	SIC						
Libya	AF	SIC					1e: all	
Mauritania	AF	SIC						
Mauritius	AF	NIC3				1d: employees, excl sugar, tea factories	1d: excl. sugar, tea factories	
Morocco	AF	SIC						1a: all, urban
Namibia	AF	SIC						
Reunion	AF	SIC						
South_Africa	AF	NIC2						
Swaziland	AF	SIC				1d: employees	1d: employees	
Tunisia	AF	NIC3				1e: all	1e: all	
Argentina	AM	NIC0					1a: all, GBA	1a: all, GBA
Bahamas	AM	SIC					1b: insured	1a: all
Barbados	AM	NIC1					1a: all	1a: all
Belize	AM	SIC			1e? employees	1d: employees		1a: all
Bolivia	AM	SIC					1e: employees	1a: all, urban
Brazil	AM	SIC					1a: all. +minq	1a: all; excl some rurl. areas
Canada	AM	OIC			3: employees	3: all	3: all	3: all
Chile	AM	NIC0					1a: all	1a: all
Colombia	AM	SIC					1a: all, urban	1a: all, urban
Costa_Rica	AM	SIC					1a: all	1a: all
Cuba	AM	NIC4					1d: employees	

COUNTRY	CONT	TYPE	before 1945	1946 to 1955	1956 to 1965	1966 to 75	1976 to 1985	1986 to 1995+
Dominican_Repub	AM	SIC						
Ecuador	AM	SIC						1a: all, urban
El_Salvador	AM	SIC					1d: employees, excl. Ag,	1a: all
Guadeloupe	AM	SIC						
Guatemala	AM	SIC						
Guyana	AM	SIC						
Honduras	AM	SIC					1e: all	1a: all, urban
Jamaica	AM	SIC				1a: all	1a: all	1a: all
Martinique	AM	SIC						1a: all
Mexico	AM	NIC3						
Netherlands Ant	AM	NIC0					1e: employees	1a: all, Curaçao
Nicaragua	AM	SIC					1b: employees	
Panama	AM	SIC				1a: all	1a: all	1a: all
Paraguay	AM	SIC					1e:	1a: all, urban
Peru	AM	SIC					1e: all	1a: all, Lima
Puerto Rico	AM	NIC1			1a: all	1a: all	1a: all	1a: all
Surinam	AM	SIC						1a: all
Trinidad and To	AM	NIC0				1a: all, +minq	1a: all, +minq	1a: all; +minq until 1988
United_States	AM	OIC		3: all 1948-97	3	3	3	3
Uruguay	AM	NIC2					1a: Montevideo	1a: all+army, urban
Venezuela	AM	SIC					1a: all	1a: all
Armenia	AS	NIC2						
Azerbaijan	AS	SIC						1e: all
Bahrain	AS	NIC0					1e: all	
Bangladesh	AS	RIC					1d: employees	
Brunei	AS	NIC1				1d:employees	1d: employees	
China	AS	RIC						1e: all
Cyprus	AS	NIC2				1e:all	1d: emplyees? Excl. Ag.	1e: all
Georgia	AS	NIC4						
Hong Kong	AS	NIC0					1a: all	1a: all
India	AS	RIC					1d: employees	
Indonesia	AS	SIC					1a: all	1a: all+army
Iran	AS	SIC						
Iraq	AS	SIC						

COUNTRY	CONT	TYPE	before 1945	1946 to 1955	1956 to 1965	1966 to 75	1976 to 1985	1986 to 1995+
Israel	AS	NIC0			1a: all, mfg+minq	1a: all, +minq	1a: all, +minq	1a: all+E. Jerusalem
Japan	AS	NIC1		1a: all	1a: all	1a: all	1a: all	1a: all+army
Jordan	AS	SIC					1c: employees. Excl. Ag	1a: all
Kazakhstan	AS	NIC2						
Korea,_Republic	AS	NIC3			1a: all	1a: all	1a: all	1a: all
Korea, _DPR	AS	SIC					1c: employees	
Kuwait	AS	NIC0						
Kyggyzstan	AS	NIC2						1e: all
Lebanon	AS	NIC4						
Malaysia	AS	SIC					1c: employees	1a: all
Maldives	AS	NIC4						
Mongolia	AS	SIC						
Oman	AS	SIC						
Pakistan	AS	SIC				1a: all	1e: all	1a: all
Philippines	AS	SIC			1a: all	1a: all	1a: all	1a: all
Qatar	AS	NIC3						
Saudi Arabia	AS	SIC						
Singapore	AS	NIC2				1a: all	1a: all	1a: all
Sri_Lanka	AS	SIC					1c: employees	1a: all, excl N. and E prov.
Syrian_Arab_Rep	AS	NIC4			1a: all	1a: all	1a: 1a: all	1a: all
Taiwan	AS	NIC2				3	3	3
Tajikistan	AS	SIC						
Thailand	AS	RIC				1a: all	1a: all	
Turkey	AS	SIC					1b: insured	1a: all
Turkmenistan	AS	SIC						
United Arab Emi	AS	NIC1						
Uzbekistan	AS	SIC						
Albania	EU	SIC				1e: employees		
Austria	EU	OIC		1b: employees	1b: employees	1a: 1969-75	1b: all insured	1a: all+army
Belarus	EU	NIC2				1d: employees, excl publ		
Belgium	EU	OIC		1e: all	1e: all	1b: all	1b: all	1a: all+army
Bosnia Herzogov	EU	NIC3						
Bulgaria	EU	NIC2			1e: employees socialist sec.	1d: all, +minq, electricity	1d: employees, +minq, soc. sec	
Croatia	EU	NIC3						
Czech Republic	EU	NIC0			1c: employed	1d: all, +minq, egw	1d: all	1a: all

COUNTRY	CONT	TYPE	before 1945	1946 to 1955	1956 to 1965	1966 to 75	1976 to 1985	1986 to 1995+
Denmark	EU	OIC				1a: all	1a: all, +army 1984-85	1a: all
Estonia	EU	NIC1						1a: all
Finland	EU	OIC			1a: all	1a: all	1a: all	1a: all+army
France	EU	OIC	1d: all, excl ag	1d: employees, excl ag	1d: employees, excl ag	1e: all	1e: all	1e: all+army
Germany	EU	OIC		1c: employees	1e: all, West excl Berlin	1e: all	1e: all, West	1a: all
Greece	EU	NIC3					1a: all	1a: all+army
Hungary	EU	NIC1			1e: all	1d: all, +egw	1d: all: +minq, egw	1e: all to 1992 1a: all 92-95
Iceland	EU	NIC0				1b: all	1b: all 81-86	1a: all 91-95 1b: all 86-90
Ireland	EU	NIC2			1e: all	1e: all	1a: all	1a: all
Italy	EU	NIC1			1a: all	1a: all, +minq	1a: all	1a: all+army
Latvia	EU	NIC1						1e: all
Lithuania	EU	NIC2						
Luxembourg	EU	NIC0		1e: all	1e: all		1e: all	1e: all
Macedonia	EU	NIC3						
Malta	EU	NIC0			1d	1d: all	1e: all, + army from 1981	1e: all+army
Moldova	EU	NIC4						1e: all
Netherlands	EU	OIC	1b: all, man-years, excl ag	1e: man-years, excl ag	1e: all, man-years, excl. ag.	1e: all	1a: all+army	1a: all+army
Norway	EU	OIC		1e: all, budget estimates	1e: all, budget estimates	1d: all 1b: all	1a: all+army	1a: all+army
Poland	EU	NIC2				1d: all	1e: all	1e: all 86-92 1a: all 93-95
Portugal	EU	NIC2				1e: all	1a: all+army	1a: all+army
Romania -	EU	NIC3				1d: all, +minq, egw	1e: all, +minq, egw	1e: all, 86-93 1a: all 94-95
Russian Federat	EU	NIC1			1e: employees, USSR, +minq+ egw	1d: employees, USSR, mfg excl publ.	1d: employees, socialised sec.	1e: all
Slovakia	EU	NIC0						1a: all
Slovenia	EU	NIC2						1a: all
Spain	EU	NIC2			1b: employees, excl ag.	1e: all	1a: all	1a: all
Sweden	EU	OIC				1a: all	1a: all +army	1a: all+army
Switzerland	EU	OIC					1e: all	

COUNTRY	CONT	TYPE	before 1945	1946 to 1955	1956 to 1965	1966 to 75	1976 to 1985	1986 to 1995+
Ukraine	EU	NIC2				1d: employees, excl publ		
United_Kingdom	EU	OIC	1b: all	1b: all	1d: employees	1d: all		1e: all
Yugoslavia,_Fed	EU	NIC4			1e: employees, socialist sector	1d: employees, soc. sec.	1d: "engaged", socialised sec.	
Australia	OC	OIC	1d? Excl rural wage earners	1d: employees, excl ag	1d: employees, excl ag	1a: all, +egw	1a: all	1a: all
Fiji	OC	SIC				1d: employees	1d: employees	
New_Zealand	OC	OIC	5: 1921-1950	1d: all	1d: employees	1d: all	1e: all	1a: all

Categories for Data Sources:

1. Survey Types in ILO Data
   - a = labour force survey
   - b = compulsory social insurance statistics
   - c = labour registration
   - d = establishment statistics, all or sample
   - e = unspecified or national satistics
2. UNIDO data in *World*Data 1995*
3. Other national statistical surveys
   - Canada - Statistics Canada (1983)
   - United States - Bureau of Labour Statistics, on-line
   - Denmark (supplementary) national statistical yearbook
   - New Zealand - Bloomfield, 1984 for pre-1950 data
   - Switzerland (supplementary) national statistical yearbook

APPENDIX V:

International Standard Industrial Classification 1968

Major Division 1.	Agriculture, Hunting, Forestry and Fishing
Major Division 2.	Mining and Quarrying
Major Division 3.	Manufacturing
	31. Food Beverages and Tobacco
	32. Textile, Wearing Apparel and Leather Industries
	33. Wood and Wood Products Including Furniture
	34. Paper and Paper Products, Printing and Publishing
	35. Chemicals and Chemical, Petroleum, Coal, Rubber, and Plastic Products
	36. Non-metallic Mineral Products, Except Products of Petroleum and Coal
	37 Basic Metal Industries
	38 Fabricated Metal Products, Machinery and Equipment
	39 Other Manufacturing Industries
Major Division 4	Electricity, Gas and Water
Major Division 5	Construction
Major Division 6	Wholesale and Retail Trade and Restaurants and Hotels
Major Division 7	Transport, Storage and Communication
Major Division 8	Financing, Insurance, and Real Estate
Major Division 9	Community, Social and Personal Services

Source: International Labour Organisation Yearbook, 1996

Appendix VI:
Benchmark Years and Indicators Values for Agricultural Labour Force = 60%

Name	Code	Type	Former Socialist or Oil	Year	Share of World Population	Historical GDP		Labour Force Activity Males 35-39	Sectoral GDP				Labour Force			Labour Force to GDP Ratio		
						Maddison 1995	Penn World Tables		AG	IND	MFG	SRV	AG	IND	SERV	AG	IND	SERV
Albania	ALB	SIC2	X-S	1977	0.0597			98.25					59.9	22.76	17.34			
Algeria	DZA	NIC4	X-S	1963	0.3581		1517	96.95	15.80	32.74	9.40	51.46	60.79	14.85	24.36	3.85	0.45	0.47
Belarus	BLR	NIC2	X-S	1957	0.3090			96.21					59.71	18.02	22.27			
Bosnia_Herz	BIH	NIC3	X-S	1963	0.1034			97.57					59.91	24.93	15.17			
Botswana	BWA	SIC2		1982	0.0211		1980	98.94	12.56	38.48	7.77	48.96	60.38	12.1	27.52	4.81	0.31	0.56
Brazil	BRA	SIC		1950	2.3576	1673	1265	97.20	*16.00*	*23.00*		*61.00*	59.81	16.59	23.60	3.74	0.72	0.39
Bulgaria	BGR	NIC2	X-S	1958	0.2963	1769		98.15					57.87	22.32	17.81			
Cape_Verde	CPV	NIC3		1957	0.0072			97.55					60.13	20.08	19.79			
Congo	COG	SIC2		1977	0.0363		1639	98.88	15.43	31.65		52.93	60.48	12.14	27.38	3.92	0.38	0.52
Cote_d'Ivoire	CIV	SIC2		1989	0.2232	1369	1336	98.73	31.84	21.89	19.43	46.27	60.43	9.45	30.12	1.9	0.43	0.65
Croatia	HRV	NIC3	X-S	1963	0.1278			97.57					59.6	25.14	15.27			
Denmark	DNK	OIC		1850	0.1331				*51.00*	*21*		*28.00*	*59.45*	*26.45*	*14.1*	1.17	1.26	0.5
Dominican_R	DOM	SIC		1962	0.1100		1354	98.57	23.71	23.42	17.62	52.87	60.41	13.05	26.53	2.55	0.56	0.5
Ecuador	ECU	SIC		1958	0.1653		1381	99.10					60.19	17.54	22.27			
El_Salvador	SLV	SIC2		1963	0.0882		1619	97.86	30.87	20.08	15.81	49.06	60.34	16.35	23.31	1.95	0.81	0.48
Fiji	FJI	SIC2		1959	0.0148			98.18					60.24	17.26	22.50			
Finland	FIN	OIC		1936	0.1654	3184							*60.26*	*17.03*	*22.71*			
Georgia	GEO	NIC4	X-S	1951	0.1582			94.20					59.81	17.03	23.16			
Ghana	GHA	SIC2		1970	0.2329	1275	1040	97.53	46.52	18.23	11.40	35.25	60.46	14.53	25.01	1.3	0.8	0.71
Guatemala	GTM	SIC2		1972	0.1440		2125	98.95					60.14	17.38	22.48			
Honduras	HND	SIC2		1976	0.0752		1378	98.17	28.55	23.24	15.06	48.22	60.36	14.48	25.17	2.11	0.62	0.52
Indonesia	IDN	SIC2		1977	3.3537	1708	1033	97.58	29.58	34.25	10.53	36.17	60.36	11.53	28.10	2.04	0.34	0.78
Iran	IRN	SIC2		1952	0.7530			98.71					59.77	19.67	20.55			
Korea_DPR	PRK	SIC2	X-S	1964	0.3693			97.96					60.31	21.35	18.34			
Korea_Republic	KOR	NIC3		1961	0.8331	1327	918	97.80	38.27	19.56	13.32	42.17	60.1	11.16	28.74	1.57	0.57	0.68
Kyggyzstan	KGZ	NIC2	X-S	1955	0.0762			95.31					59.53	16.99	23.49			
Lithuania	LTU	NIC2	X-S	1955	0.1065			94.51					59.6	17.56	22.84			
Macedonia	MKD	NIC3	X-S	1963	0.0451			97.57					48.35	29.59	22.06			
Malaysia	MYS	SIC		1963	0.2791		1577	97.85	31.54	23.05	8.33	45.41	60.4	12.46	27.14	1.92	0.54	0.6

Name	Code	Type	Former Socialist or Oil	Year	Share of World Population	Historical GDP		Labour Force Activity Males 35-39	Sectoral GDP				Labour Force			Labour Force to GDP Ratio		
						Maddi-son 1995	Penn World Tables		AG	IND	MFG	SRV	AG	IND	SERV	AG	IND	SERV
Maldives	MDV	NIC4		1974	0.0033			98.50					59.39	23.64	16.98			
Mauritania	MRT	SIC2		1987	0.0372		809	97.80	32.31	26.75	12.08	40.93	60.09	9.29	30.62	1.86	0.35	0.75
Mexico	MEX	NIC3		1950	1.2370	2085	2198	97.90	*18.00*	*23.00*		*59.00*	60.36	16.81	22.83	3.35	0.73	0.39
Moldova	MDA	NIC4	X-S	1967	0.0990			97.85					59.64	17.97	22.39			
Mongolia	MNG	SIC		1961	0.0320			98.19					59.52	19.2	21.28			
Morocco	MAR	SIC2		1967	0.4054	1566	1184	97.00	21.74	28.54	16.07	49.73	60.06	15.62	24.32	2.76	0.55	0.49
Namibia	NAM	SIC2		1975	0.0221		3608	98.12					60.09	15.04	24.88			
Nicaragua	NIC	SIC		1961	0.0503		1684	98.04	23.91	21.54	16.40	54.55	60.63	16.19	23.19	2.54	0.75	0.43
Pakistan	PAK	SIC2		1962	1.6816	716	670	97.78	43.33	17.92	13.72	38.74	60.44	18.04	21.51	1.39	1.01	0.56
Philippines	PHL	SIC2		1966	0.9711	1647	1253	98.12	25.69	27.11	19.46	47.20	60.21	14.56	25.24	2.34	0.54	0.53
Romania	ROM	NIC3		1963	0.5867	2137	509	98.35					59.7	23.66	16.65			
Slovenia	SVN	NIC2	X-S	1963	0.0503			97.57					59.59	25.15	15.27			
Swaziland	SWZ	SIC2		1973	0.0116		2585	98.49	35.68	26.07		38.25	60.45	14.52	25.03	1.69	0.56	0.65
Sweden	SWE	OIC		1896	0.3240	2367			*29.00*	*26.00*		*45.00*	*60.69*	*18.77*	*20.54*	2.09	0.72	2.19
Tajikistan	TJK	SIC2	X-S	1960	0.0684			97.83					59.85	16.22	23.93			
Tunisia	TUN	NIC3		1956	0.1449			97.00					60.54	16.34	23.13			
Turkey	TUR	SIC2		1980	1.0004	3192	2874	97.93	26.41	22.17	14.32	51.42	60.33	15.91	23.77	2.28	0.72	0.46
United_States	USA	OIC		1858	3.0681	1819							*60.35*	*19.46*	*20.19*			
Uzbekistan	UZB	SIC	X-S	1958	0.3067			96.37					59.65	16.81	23.53			
Yugoslavia_F	YUG	NIC4	X-S	1963	0.2579	2731	2199	97.57					59.45	25.23	15.31			

Appendix VII: Benchmark Years and Indicators Values for Industrial Labour Force = 20%

Country	Code	Type	Former Socialist or Oil	Year	Share of World Population	Historical GDP		Labour Force Activity Males 35-39	Sectoral GDP				Labour Force Share			Labour Force to GDP Ratio		
						Maddison 1995	Penn World Tables		AG	IND	MFG	SRV	AG	IND	SERV	AG	IND	SERV
Albania	ALB	SIC2	CP	1967	0.0568			87.77					67.66	20.11	12.24			
Algeria	DZA	NIC4		1969	0.3690		1835	97.05	10.53	38.60	13.20	50.87	49.29	20.39	30.33	4.68	0.53	0.6
Argentina	ARG	NIC0		1904	0.3341	3191			*33.00*	*16.00*		*51.00*						
Austria	AUT	OIC		1880	0.3677	2093							*55.6*	*20.53*	*23.87*			
Belarus	BLR	NIC2	CP	1959	0.3049			96.22					56.76	19.56	23.68			
Bosnia_Herz	BIH	NIC3	CP	1957	0.1162			97.42					66.96	20.28	12.76			
Botswana	BWA	SIC2		1990	0.0243			98.89	5.46	58.54	4.38	36.00	46.36	20.4	33.24	8.49	0.35	0.92
Brazil	BRA	SIC		1964	2.5042	2482	1892	96.74	17.28	34.88	26.64	47.84	49.2	19.73	31.08	2.85	0.57	0.65
Bulgaria	BGR	NIC2	CP	1956	0.3023	2128		98.20					63.09	20.1	16.80			
Cape_Verde	CPV	NIC3		1956	0.0071			97.55					61.16	19.58	19.27			
Colombia	COL	SIC		1961	0.5329	2548	1734	97.69					49.28	19.56	31.17			
Costa_Rica	CRI	SIC		1968	0.0459		2672	98.42	22.99	23.57		53.44	44.33	19.65	36.03	1.93	0.83	0.67
Croatia	HRV	NIC3	CP	1956	0.1590			97.47					67.54	19.53	12.93			
Dominican_R	DOM	SIC		1976	0.1246		2057	98.19	19.05	31.34	20.62	49.61	38.5	19.94	41.55	2.02	0.64	0.84
Ecuador	ECU	SIC		1966	0.1556		1716	98.94	26.38	22.91	18.93	50.71	53.95	19.52	26.54	2.05	0.85	0.52
Egypt	EGY	SIC2		1987	1.0046	2003	1890	98.25	20.56	29.33	15.47	50.11	45.34	19.76	34.90	2.21	0.67	0.7
El_Salvador	SLV	SIC2		1981	0.1012		1863	98.11	34.39	22.48	17.06	43.13	42.54	19.53	37.93	1.24	0.87	0.88
Georgia	GEO	NIC4	CP	1958	0.1549			94.51					51.18	19.78	29.04			
Greece	GRC	NIC3		1953	0.3303	2352	1441	96.62	*31.00*	*21.00*		*48.00*	54.7	19.31	25.99	1.76	0.92	0.54
Honduras	HND	SIC2		1990	0.0928		1377	97.88	22.39	26.31	16.31	51.29	41.4	19.62	38.98	1.85	0.75	0.76
Iran	IRN	SIC2		1952	0.7530			98.71					59.77	19.67	20.55			
Iraq	IRQ	SIC		1964	0.2368		4021	96.77					50.71	19.68	29.61			
Kazakhstan	KAZ	NIC2	CP	1951	0.2968			95.42					52.61	19.83	27.55			
Korea_DPR	PRK	SIC2	CP	1961	0.3600			97.99					63.06	19.81	17.13			
Korea_Republic	KOR	NIC3		1970	0.8559	2208	1680	97.30	25.37	28.72	20.83	45.91	49.14	19.82	31.04	1.94	0.69	0.68
Kyggyzstan	KGZ	NIC2	CP	1958	0.0776			95.47					53.73	19.88	26.40			
Lebanon	LBN	NIC4		1950	0.0644			97.50					55.11	20.39	24.50			
Lithuania	LTU	NIC2	CP	1958	0.1039			94.74					55.27	20.37	24.36			
Macedonia	MKD	NIC3	CP	1956	0.0541			97.47					67.37	19.67	12.96			

Country	Code	Type	Former Socialist or Oil	Year	Share of World Population	Historical GDP		Labour Force Activity Males 35-39	Sectoral GDP				Labour Force Share			Labour Force to GDP Ratio		
						Maddi-son 1995	Penn World Tables		AG	IND	MFG	SRV	AG	IND	SERV	AG	IND	SERV
Malaysia	MYS	SIC		1982	0.3151		4171	97.40	20.47	34.92	18.25	44.62	38.09	19.64	42.26	1.86	0.56	0.95
Maldives	MDV	NIC4		1968	0.0033			98.54					66.46	19.52	14.03			
Mexico	MEX	NIC3		1961	1.2348	2802	2864	97.41	15.28	24.82	18.22	59.90	53.97	19.93	26.10	3.53	0.8	0.44
Moldova	MDA	NIC4	CP	1969	0.0978			97.94					56.09	20.12	23.80			
Mongolia	MNG	SIC		1963	0.0324			98.19					56.92	19.6	23.48			
Morocco	MAR	SIC2		1978	0.4314	2057	1819	97.80	18.92	31.34	16.98	49.74	56.33	19.63	24.12	2.98	0.63	0.48
Nicaragua	NIC	SIC		1973	0.0579		2357	97.94	24.60	27.04	21.31	48.35	46.83	19.7	33.47	1.9	0.73	0.69
Norway	NOR	OIC		1884	0.1393	1466			*30.00*	*21.50*		*48.50*	*36.77*	*18.92*	*44.31*	1.23	0.88	0.91
Paraguay	PRY	SIC2		1971	0.0639		1448	98.92	33.20	20.78	16.40	46.03	52.28	19.53	28.19	1.57	0.94	0.61
Peru	PER	SIC2		1958	0.3405	2745	1832	98.52	*17.00*	*22.00*		*61.00*	53.39	19.68	26.93	3.14	0.89	0.44
Reunion	REU	SIC		1957	0.0121			99.60					49.21	19.73	31.06			
Romania	ROM	NIC3		1959	0.6860			98.53					65.19	19.9	14.92			
Slovenia	SVN	NIC2	CP	1956	0.0615			97.47					67.53	19.54	12.93			
Sri_Lanka	LKA	SIC2		1986	0.3326		2048	98.21	27.09	26.60	15.19	46.31	49.84	19.65	30.51	1.84	0.74	0.66
Swaziland	SWZ	SIC2		1982	0.0131		2845	98.32	20.33	29.64	21.39	50.03	47.88	19.58	32.74	2.36	0.66	0.65
Sweden	SWE	OIC		1889	0.3306	2065			*32.00*	*22*		*46.00*	*70.66*	*16.36*	*12.98*	2.21	0.74	0.28
Syrian_Arab_Rep	SYR	NIC4		1963	0.1564		2089	97.31	26.90	22.95		50.16	53	19.52	27.48	1.97	0.85	0.55
Tajikistan	TJK	SIC2	CP	1966	0.0760			98.40					51.74	19.6	28.65			
Tunisia	TUN	NIC3		1962	0.1397		1110	98.34	20.59	18.88	6.74	60.54	53	19.51	27.49	2.57	1.03	0.45
Turkmenistan	TKM	SIC2	CP	1958	0.0569			94.19					49.24	19.52	31.24			
United_States	USA	OIC		1859	3.1586	1819							*59.9*	*19.7*	*20.4*			
Uzbekistan	UZB	SIC	CP	1963	0.2994			97.05					53.1	19.54	27.35			
Yugoslavia_F	YUG	NIC4	CP	1956	0.1935	1724		97.47					67.41	19.62	12.96			

Appendix VIII:
Benchmark Years and Indicators Values for the Manufacturing Employment Peak

Country	CODE	TYPE	% of World Population	Year of Peak	Year IND= 30%	GDP at the Peak	GDP Change	Labour Partic. At Peak	Labour Partic. Change
ARGENTINA	ARG	NIC0	0.6385	1975	1948	8132	2880	98.07	-0.33
AUSTRALIA	AUS	OIC	0.3745	1954	1906	7561	2733	98.12	
AUSTRIA	AUT	OIC	0.1918	1973	1916	11308	8663	97.75	
BARBADOS	BRB	NIC1	0.0054	1983	1962			95.43	-2.72
BELGIUM	BEL	OIC	0.3511	1947	1846	4699	2891	96.30	
BRAZIL	BRA	SIC	2.6967	1978		4727		96.79	
CANADA	CAN	OIC	0.6129	1950	1942	7047	383	98.90	
CHILE	CHL	NIC0	0.2569	1967	1949	5060	1345	97.80	-0.20
CYPRUS	CYP	NIC2	0.0140	1982	1973			99.07	0.31
DENMARK	DNK	OIC	0.1464	1963	1936	9379	4016	98.36	
FINLAND	FIN	OIC	0.1171	1974	1947	11034	7424	95.67	-2.78
FRANCE	FRA	OIC	1.3063	1974	1907	13205	10164	98.10	
GERMANY	DEU	OIC	2.1017	1970	1881	11933	9819	98.35	
GREECE	GRC	NIC3	0.2036	1986		9605		97.08	
GUYANA	GUY	SIC	0.0192	1970				97.95	
IRAN	IRN	SIC2	0.9593	1983				97.96	
IRELAND	IRL	NIC2	0.0782	1974	1968	7149	1330	97.09	-0.53
ISRAEL	ISR	NIC0	0.0768	1965				96.90	
ITALY	ITA	NIC1	1.3764	1974	1943	10905	7932	98.37	
JAPAN	JPN	NIC1	2.7647	1973	1961	11017	6710	98.52	0.62
KOREA_S	KOR	NIC3	0.8213	1989	1984	8294	2863	96.45	-0.22
KUWAIT	KWT	NIC0	0.0252	1977				98.52	
LUXEMBOURG	LUX	NIC0	0.0095	1968				97.63	
MALTA	MLT	NIC0	0.0073	1979				98.67	
MAURITIUS	MUS	NIC3	0.0205	1988	1982			97.12	-0.04
MEXICO	MEX	NIC3	1.5096	1980		5254		97.48	
NETHERLANDS	NLD	OIC	0.4403	1954	1884	6739	3402	98.40	
NEW_ZEALAND	NZL	OIC	0.0788	1965	1901	10966	6721	98.85	
NORWAY	NOR	OIC	0.1116	1965	1938	7906	3961	98.02	
PANAMA	PAN	SIC	0.0439	1980				97.20	
PORTUGAL	PRT	NIC2	0.2051	1985	1962	8548	5110	96.71	-1.43
PUERTO_RICO	PRI	NIC1	0.0744	1969	1962			93.61	-1.43
SINGAPORE	SGP	NIC2	0.0541	1981	1969			98.22	-0.10
SOUTH_AFRICA	ZAF	NIC2	0.6648	1980	1969	4114	515	97.90	-0.17
SPAIN	ESP	NIC2	0.8725	1975	1957	9156	5778	97.09	-1.12
SURINAME	SUR	SIC	0.0101	1970				98.20	
SWEDEN	SWE	OIC	0.2384	1963	1918	9917	7384	97.30	
SWITZERLAND	CHE	OIC	0.1756	1965	1900	14305	10774	99.05	
SYRIA	SYR	NIC4	0.1996	1981				98.57	
TAIWAN	TAI	NIC2	0.3939	1987	1971	8817	5839		
TRINIDAD_TOBAGO	TTO	NIC0	0.0244	1980				97.00	
UNITED_ARAB_EM	ARE	NIC1	0.0228	1970	1961			98.40	0.27
UNITED_KINGDOM	GBR	OIC	2.0823	1955	1841	7759	5397	98.93	
UNITED_STATES	USA	OIC	6.7903	1953	1897	10810	7036	97.79	
URUGUAY	URY	NIC2	0.0663	1979				97.80	

Industry								
Country	CODE	TYPE	Labour Force at Peak	Change from IND=30%	GDP Share at Peak	Change from IND=30%	Ratio of Shares at Peak	Change from IND=30%
ARGENTINA	ARG	NIC0	34.29	4.29	50.14	31.94	0.80	-0.21
AUSTRALIA	AUS	OIC	39.91	9.91	37.00	11.00	1.04	-0.05
AUSTRIA	AUT	OIC	46.28	16.28	42.57	-2.43	0.97	0.23
BARBADOS	BRB	NIC1	41.25	11.25	23.19	1.02	1.14	-0.39
BELGIUM	BEL	OIC	50.66	20.66	46.00		1.06	
BRAZIL	BRA	SIC	23.93		40.13		0.55	
CANADA	CAN	OIC	36.02	6.02	35.00	1.00	1.04	0.17
CHILE	CHL	NIC0	30.44	0.44	38.81	-1.79	0.78	0.06
CYPRUS	CYP	NIC2	33.53	3.53	30.86	5.68	1.03	
DENMARK	DNK	OIC	36.98	6.98	39.00	7.00	0.96	0.01
FINLAND	FIN	OIC	35.47	5.47	53.57	19.57	0.68	-0.18
FRANCE	FRA	OIC	39.27	9.27	37.70	-2.30	1.02	0.29
GERMANY	DEU	OIC	50.80	20.80	48.00	15.00	1.02	-0.05
GREECE	GRC	NIC3	28.52		44.32		0.65	
GUYANA	GUY	SIC	28.52		40.28		0.71	
IRAN	IRN	SIC2	29.18		34.93		0.75	
IRELAND	IRL	NIC2	33.81	3.81	34.60	5.10	1.00	0.00
ISRAEL	ISR	NIC0	35.60	5.60				
ITALY	ITA	NIC1	43.58	13.58	41.05	16.05	1.02	0.11
JAPAN	JPN	NIC1	34.64	4.64	46.39	1.15	0.77	0.10
KOREA, SOUTH	KOR	NIC3	35.36	5.36	43.13	0.67	0.80	0.08
KUWAIT	KWT	NIC0	34.12	4.12			0.45	
LUXEMBOURG	LUX	NIC0	43.92	13.92	48.30		0.90	
MALTA	MLT	NIC0	49.94	19.94	42.63		1.19	
MAURITIUS	MUS	NIC3	43.18	13.18	32.44	7.87	1.29	0.17
MEXICO	MEX	NIC3	29.09		32.74		0.89	
NETHERLANDS	NLD	OIC	42.47	12.47	41.00		0.94	
NEW ZEALAND	NZL	OIC	36.61	6.61				
NORWAY	NOR	OIC	36.94	6.94	32.76	-0.24	1.20	0.28
PANAMA	PAN	SIC	19.44		20.46		0.95	
PORTUGAL	PRT	NIC2	36.23	6.23	39.60	5.60	0.91	0.07
PUERTO RICO	PRI	NIC1	31.17	1.17	34.00	1.20	0.91	-0.05
SINGAPORE	SGP	NIC2	41.65	11.65	37.86	10.50	1.08	0.03
SOUTH AFRICA	ZAF	NIC2	34.66	4.66	50.02	10.25	1.05	0.31
SPAIN	ESP	NIC2	37.56	7.56	36.20	4.20	1.05	0.23
SURINAME	SUR	SIC	21.88		47.10		0.46	
SWEDEN	SWE	OIC	45.25	15.25	41.28	7.43	1.05	0.15
SWITZERLAND	CHE	OIC	50.19	20.19				
SYRIA	SYR	NIC4	28.05	1.95			1.18	
TAIWAN	TAI	NIC2	42.77	12.77	43.42	7.55	0.99	
TRINIDAD & TOBAGO	TTO	NIC0	38.72	8.72	60.16		0.64	
UNITED ARAB EM.	ARE	NIC1	39.46	9.46				
UNITED KINGDOM	GBR	OIC	49.49	19.49	47.00	12.00	1.04	-0.34
UNITED STATES	USA	OIC	36.68	6.68	34.00		1.22	
URUGUAY	URY	NIC2	29.06				0.84	

Service								
Country	CODE	TYPE	Labour Force at Peak	Change from IND=30%	GDP Share at Peak	Change from IND=30%	Ratio of Shares at Peak	Change from IND=30%
ARGENTINA	ARG	NIC0	43.13	-8.84	43.27	-11.73	1.00	0.21
AUSTRALIA	AUS	OIC	46.44	-1.43	41.00	-4.00	1.13	0.21
AUSTRIA	AUT	OIC	44.33	17.85	51.66	7.66	0.86	0.21
BARBADOS	BRB	NIC1	67.01	-4.25	69.67	11.20	0.96	0.18
BELGIUM	BEL	OIC	37.48	37.77	45.00		0.83	
BRAZIL	BRA	SIC	38.17		48.25		0.79	
CANADA	CAN	OIC	44.14	-7.01	53.00	0.00	0.83	0.02
CHILE	CHL	NIC0	44.37	-6.39	52.91	-0.09	0.84	0.14
CYPRUS	CYP	NIC2	43.68	-2.21	59.87	0.76	0.73	0.12
DENMARK	DNK	OIC	47.14	-1.86	51.50	1.50	0.92	0.14
FINLAND	FIN	OIC	48.47	5.65	33.66	2.66	1.44	0.48
FRANCE	FRA	OIC	51.12	10.69	56.60	29.60	0.90	-0.16
GERMANY	DEU	OIC	42.73	34.31	47.40	16.40	0.90	0.37
GREECE	GRC	NIC3	45.94		31.78		1.45	
GUYANA	GUY	SIC	39.57		40.55		0.98	
IRAN	IRN	SIC2	32.96		47.01		0.70	
IRELAND	IRL	NIC2	44.63	-8.06	51.40	-2.70	0.87	0.09
ISRAEL	ISR	NIC0	52.61					
ITALY	ITA	NIC1	42.52	19.58	52.10	21.10	0.82	0.04
JAPAN	JPN	NIC1	48.43	-3.66	47.68	5.25	1.02	0.11
KOREA SOUTH	KOR	NIC3	45.51	-5.06	47.23	2.62	0.96	0.06
KUWAIT	KWT	NIC0	65.87		28.66		2.30	
LUXEMBOURG	LUX	NIC0	46.91		46.80		1.00	
MALTA	MLT	NIC0	42.75		53.46		0.80	
MAURITIUS	MUS	NIC3	41.14	-1.03	24.30	-35.86	1.69	0.96
MEXICO	MEX	NIC3	34.60		59.04		0.59	
NETHERLANDS	NLD	OIC	46.37	5.07	46.00		1.01	
NEW ZEALAND	NZL	OIC	50.54	-0.39				
NORWAY	NOR	OIC	47.40	2.14	59.38	5.38	0.80	0.15
PANAMA	PAN	SIC	51.63		69.68		0.74	
PORTUGAL	PRT	NIC2	42.95	9.22	52.50	10.40	0.82	0.18
PUERTO RICO	PRI	NIC1	54.10	-16.09	62.39	3.89	0.87	0.06
SINGAPORE	SGP	NIC2	57.15	-24.98	60.93	-9.15	0.94	-0.01
SOUTH AFRICA	ZAF	NIC2	48.05	-4.18	43.15	-7.94	1.11	0.35
SPAIN	ESP	NIC2	40.67	11.59	53.30	12.30	0.76	0.13
SURINAME	SUR	SIC	51.41		45.58		1.13	
SWEDEN	SWE	OIC	43.82	17.03	53.90	13.90	0.81	0.11
SWITZERLAND	CHE	OIC	41.14	31.74				
SYRIA	SYR	NIC4	34.20		55.08		0.62	
TAIWAN	TAI	NIC2	41.95	7.79	50.48	2.24	0.83	0.11
TRINIDAD & TOBAGO	TTO	NIC0	50.37		37.67		1.34	
UNITED ARAB EM	ARE	NIC1	51.74	-3.42				
UNITED KINGDOM	GBR	OIC	46.64	16.09	48.00	5.00	0.97	0.19
UNITED STATES	USA	OIC	52.76	5.38	60.00		0.88	
URUGUAY	URY	NIC2	54.91		49.54		1.11	

Agriculture								
Country	CODE	TYPE	Labour Force at Peak	Change from IND=30%	GDP Share at Peak	Change from IND=30%	Ratio of Shares at Peak	Change from IND=30%
ARGENTINA	ARG	NIC0	25.07	0.00	6.58	-12.42	3.81	2.49
AUSTRALIA	AUS	OIC	13.77	-14.74	22.00	-7.00	0.63	-0.36
AUSTRIA	AUT	OIC	13.32	-28.58	5.77	-5.23	2.31	-1.50
BARBADOS	BRB	NIC1	8.95	-15.51	7.14	-12.22	1.25	-0.01
BELGIUM	BEL	OIC	11.85	-39.05	9.00		1.32	
BRAZIL	BRA	SIC	38.33		11.61		3.30	
CANADA	CAN	OIC	19.84	-7.07	12.00	-1.00	1.65	-0.42
CHILE	CHL	NIC0	26.01	-7.13	8.28	-2.72	3.14	0.13
CYPRUS	CYP	NIC2	23.49	-11.21	9.27	-6.45	2.53	0.33
DENMARK	DNK	OIC	15.91	-15.66	11.30	-6.70	1.41	-0.35
FINLAND	FIN	OIC	16.60	-18.41	12.77	-26.23	1.30	0.40
FRANCE	FRA	OIC	11.47	-30.40	5.70	-27.30	2.01	0.74
GERMANY	DEU	OIC	8.71	-38.01	3.20	-32.80	2.72	1.42
GREECE	GRC	NIC3	26.26		23.91		1.10	
GUYANA	GUY	SIC	31.91		19.17		1.66	
IRAN	IRN	SIC2	43.57		18.06		2.41	
IRELAND	IRL	NIC2	23.24	-5.16	14.00	-2.40	1.66	-0.07
ISRAEL	ISR	NIC0	12.04					
ITALY	ITA	NIC1	16.32	-29.68	6.87	-37.13	2.38	1.33
JAPAN	JPN	NIC1	17.02	-14.70	5.93	-6.40	2.87	0.30
KOREA, SOUTH	KOR	NIC3	20.01	-9.51	9.64	-3.29	2.08	-0.21
KUWAIT	KWT	NIC0	1.89		0.19		9.95	
LUXEMBOURG	LUX	NIC0	9.42		4.90		1.92	
MALTA	MLT	NIC0	8.07		3.92		2.06	
MAURITIUS	MUS	NIC3	18.80	-6.26	13.05	-2.22	1.44	-0.20
MEXICO	MEX	NIC3	36.32		8.23		4.41	
NETHERLANDS	NLD	OIC	14.91	-17.69	13.00		1.15	
NEW ZEALAND	NZL	OIC	13.31	-19.73				
NORWAY	NOR	OIC	15.80	-19.40	7.86	-5.14	2.01	-0.70
PANAMA	PAN	SIC	28.93		9.86		2.93	
PORTUGAL	PRT	NIC2	21.93	-22.09	8.00	-15.50	2.74	0.87
PUERTO RICO	PRI	NIC1	14.92	-8.16	3.61	-4.89	4.13	1.42
SINGAPORE	SGP	NIC2	1.44	-2.39	1.21	-1.35	1.19	-0.31
SOUTH AFRICA	ZAF	NIC2	17.29	-14.34	6.82	-2.31	2.54	-0.93
SPAIN	ESP	NIC2	22.22	-22.27	9.30	-13.70	2.39	0.45
SURINAME	SUR	SIC	26.72		7.32		3.65	
SWEDEN	SWE	OIC	12.36	-29.44	6.10	-18.90	2.03	0.35
SWITZERLAND	CHE	OIC	9.54	-25.00				
SYRIA	SYR	NIC4	38.16		19.40		1.97	
TAIWAN	TAI	NIC2	15.28	-18.86	5.33	-9.95	2.87	0.63
TRINIDAD & TOBAGO	TTO	NIC0	10.91		2.17		5.03	
UNITED ARAB EM	ARE	NIC1	8.80	-17.99				
UNITED KINGDOM	GBR	OIC	4.75	-17.53	4.00	-18.00	1.19	0.17
UNITED STATES	USA	OIC	10.60	-28.55	6.00		1.77	
URUGUAY	URY	NIC2	16.85		15.06		1.12	

Appendix IX:

Detailed Results of Regressions

A. Agricultural Labour Force Share = 60%

Variables	Regression, Unweighted				Regression, Weighted			
From 1950	R^2	D.F	Sig.	Slope	R^2	D.F	Sig.	Slope
GDP per capita	.004	18	.794	3.2270	.000	12	.946	-1.0049
Industry								
Labour Force Share	.440	18	.001	-.1502	.436	12	.010	-.1460
GDP Share	.128	18	.121	.1823	.281	12	.049	.2677
Labour Share / GDP Share	.331	18	.008	-.0097	.321	12	.033	-.0104
Service								
Labour Force Share	.419	18	.002	.1478	.383	12	.017	.1346
GDP Share	.196	18	.051	-.2905	.548	12	.002	-.6303
Labour Share / GDP Share	.332	18	.008	.0060	.568	12	.002	.0099
Agriculture								
Labour Force Share	--				--			
GDP Share	.016	18	.595	.1081	.202	12	.103	.3627
Labour Share / GDP Share	.012	18	.645	-.0096	.395	13	.015	-.0470
Male Activity Rate (35-39)	.213	18	.041	.0239	.110	12	.243	.0106
From 1960								
GDP per capita	.037	16	.447	11.6837	.181	8	.222	32.7119
Industry								
Labour Force Share	.349	16	.010	-.1539	.236	8	.157	-.1610
GDP Share	.124	16	.153	.2199	.303	8	.101	.4667
Labour Share / GDP Share	.296	16	.020	-.0110	.313	8	.094	-.0170
Service								
Labour Force Share	.350	16	.010	.1575	.227	8	.165	.1606
GDP Share	.019	16	.583	-.0907	.019	8	.709	-.1055
Labour Share / GDP Share	.163	16	.096	.0046	.161	8	.252	.0064
Agriculture								
Labour Force Share	--				--			
GDP Share	.017	16	.602	-.1293	.139	8	.290	-.3611
Labour Share / GDP Share	.022	16	.553	.0151	.028	8	.648	.0119
Male Activity Rate (35-39)	.172	16	.087	.0252	.009	8	.797	.0042

B. Industrial Labour Force Share = 20%

Variables	Regression, Unweighted				Regression, Weighted			
From 1950	R^2	D.F	Sig.	Slope	R^2	D.F	Sig.	Slope
GDP per capita	.047	18	.357	14.2016	.002	7	.915	2.4650
Industry								
Labour Force Share	--				--			
GDP Share	.246	19	.022	.3940	.030	7	.665	.0926
Labour Share / GDP Share	.306	19	.009	-.0082	.067	7	.513	-.0032
Service								
Labour Force Share	.370	19	.003	.2951	.373	7	.088	.2555
GDP Share	.321	19	.007	-.3014	.153	7	.310	-.2007
Labour Share / GDP Share	.500	19	.000	.0099	.344	7	.105	.0072
Agriculture								
Labour Force Share	.377	19	.003	-.3010	.371	7	.089	-.2556
GDP Share	.021	19	.531	-.0927	.047	7	.586	.1081
Labour Share / GDP Share	.029	19	.463	.0241	.120	7	.372	-.0274
Male Activity Rate (35-39)	.131	19	.107	.0227	.310	7	.128	.0364
From 1960								
GDP per capita	.014	16	.635	9.1133	.003	6	.895	-3.4710
Industry								
Labour Force Share	--				--			
GDP Share	.189	17	.063	.3938	.000	6	5..983	-.0048
Labour Share / GDP Share	.217	17	.044	-.0077	.005	6	.873	-.0008
Service								
Labour Force Share	.292	17	.017	.2919	.318	6	.144	.2477
GDP Share	.349	17	.008	-.3324	.151	6	.340	-.1985
Labour Share / GDP Share	.452	17	.002	.0104	.300	6	.159	.0070
Agriculture								
Labour Force Share	.294	17	.017	-.2949	.310	6	.151	-.2439
GDP Share	.007	17	.725	-.0616	.173	6	.305	.2033
Labour Share / GDP Share	.029	17	.489	.0282	.202	6	.263	-.0376
Male Activity Rate (35-39)	.100	17	.187	.0207	.443	6	.071	.0434

C. Manufacturing Employment Peak

Variable	All vs Time, Unweighted				OICs vs Time, Unweighted				NICs vs Time, Unweighted			
GDP per capita	Rsq	d.f.	Sigf	bl	Rsq	d.f.	Sigf	bl	Rsq	d.f.	Sigf	bl
GDP per capita at Peak	.004	26	.739	14.8946	.595	13	.001	227.692	.014	11	.702	41.7432
Change in GDP per capita	.017	23	.530	34.6408	.566	13	.001	259.711	.007	8	.821	29.9561
Industrial Sector												
Time from IND=30% to Peak	.403	38	.000	-1.7553	.023	13	.585	-.4982	.009	23	.645	-.1433
Labour Force Share at Peak	.103	43	.031	-.2309	.005	13	.811	-.0452	.013	28	.555	.1202
Change in Labour Force	.050	35	.185	-.1179	.005	13	.811	-.0452	.059	20	.275	.1748
GDP share at Peak	.005	36	.673	-.0495	.088	11	.325	.1903	.029	23	.416	-.2260
Change in GDP share	.000	23	.973	.0053	.000	8	.954	-.0181	.000	13	.991	-.0036
Labour Force to GDP share	.034	39	.248	-.0034	.184	11	.143	-.0058	.087	26	.126	.0104
Change in ratio	.008	21	.685	.0016	.062	8	.489	.0059	.002	11	.888	.0011
Service Sector												
Labour Force share at peak	.000	43	.964	-.0046	.065	13	.359	.1129	.025	28	.405	-.1957
Change in Labour Force	.089	29	.103	-.3655	.009	13	.735	.1487	.023	14	.575	.2305
GDP share at peak	.004	39	.706	-.0544	.001	11	.935	-.0194	.011	26	.600	-.1811
Change in GDP	.033	23	.387	-.2126	.361	8	.066	.6703	.078	13	.315	-.5332
Labour Force to GDP share	.017	39	.415	.0037	.061	11	.416	.0045	.009	26	.636	.0054
Change in ratio	.051	23	.278	.0044	.044	8	.559	.0042	.129	13	.189	.0120
Agricultural Sector												
Labour Force Share at peak	.102	43	.032	.2895	.001	13	.924	-.0110	.014	28	.529	.1941
Change in Labour Force	.097	29	.088	.2676	.049	13	.429	-.2203	.001	14	.921	-.0309
GDP share at peak	.000	39	.939	.0062	.104	11	.283	-.1714	.044	26	.285	.1972
Change in GDP share	.002	23	.819	.0469	.312	8	.093	-.7144	.012	13	.699	.1439
Labour Force to GDP share	.053	39	.146	.0330	.319	11	.044	.0332	.038	26	.322	-.0547
Change in ratio	.012	23	.600	.0089	.044	8	.560	.0196	.121	13	.204	-.0425
Male Activity Rates (35-39)												
Activity rate at Peak	.041	42	.186	-.0208	.016	13	.649	-.0137	.001	27	.864	-.0057
Change in rate	.000	13	.951	-.0026	few cases				.015	12	.674	-.0155
	All vs Industrial Labour Force Maximum, Unweighted				OICs vs Industrial Labour Force Maximum, Unweighted				NICs vs Industrial Labour Force Maximum, Unweighted			
GDP per capita	.164	26	.033	153.406	.001	13	.925	11.7774	.345	11	.035	249.839
Labour Force/GDP share	.281	39	.000	.0139	.006	11	.795	.0018	.292	26	.003	.0162

Variables	All Cases vs Time, Weighted				OICs vs Time, Weighted				NICs vs Time, Weighted			
GDP per capita	Rsq	d.f.	Sigf	bl	Rsq	d.f.	Sigf	bl	Rsq	d.f.	Sigf	bl
GDP per capita at Peak	.066	26	.192	-57.328	.383	13	.014	152.016	.125	10	.249	-195.81
Change in GDP per capita	.000	21	.924	4.5444	.520	13	.002	209.061	.171	6	.305	-169.69
Industrial Sector												
Time between IND=30% and peak	.428	27	.000	-1.9245	.038	13	.484	.6055	.199	12	.110	-.9464
Labour Force share at peak	.156	27	.033	-.2495	.159	13	.139	.2956	.024	12	.594	-.1886
Change in labour force	.011	22	.629	-.0530	.159	13	.139	.2956	.012	7	.783	.0723
GDP share at peak	.076	27	.150	.1337	.222	13	.078	.3440	.051	12	.444	-.2456
Change in GDP share	.017	14	.638	-.1080	.029	5	.705	-.1355	.004	6	.881	-.0981
Labour force to GDP share	.497	27	.000	-.0121	.360	13	.019	-.0078	.000	12	.976	-.0003
Change in ratio	.296	13	.035	.0112	.316	5	.176	.0149	.010	6	.813	.0023
Service Sector												
Labour Force share at peak	.377	27	.000	.3098	.113	13	.218	-.1778	.123	12	.217	-.3915
Change in labour force	.006	21	.716	.0842	.283	13	.040	.7558	.005	6	.871	-.1191
GDP share at peak	.188	27	.019	.2259	.103	13	.247	-.2459	.009	12	.745	-.1012
Change in GDP share	.006	14	.771	.0861	.735	5	.011	1.0042	.055	6	.568	-.3913
Labour force to GDP share	.021	27	.449	-.0017	.015	13	.661	.0011	.013	12	.696	-.0042
Change in ratio	.012	14	.691	-.0016	.003	5	.906	-.0011	.005	6	.859	.0012
Agricultural Sector												
Labour Force share at peak	.419	27	.000	.5928	.004	13	.821	-.0250	.095	12	.281	.6340
Change in labour force	.074	21	.206	.2220	.185	13	.108	-.4040	.019	6	.739	.1959
GDP share at peak	.090	27	.115	.1000	.088	13	.286	-.1236	.195	12	.114	.3599
Change in GDP share	.002	14	.865	.0578	.547	5	.050	-.8799	.052	6	.580	.4626
Labour force to GDP share	.420	27	.000	.0472	.421	13	.009	.0385	.023	12	.604	-.0245
Change in ratio	.023	14	.581	.0122	.370	5	.136	.0509	.096	6	.446	-.0441
Male Activity Rates (35-39)												
Activity Rate at peak	.106	27	.087	-.0197	.018	13	.636	.0092	.214	12	.100	-.0752
Change in activity rate	.064	5	.599	-.0331	Too few data				.102	4	.510	-.0367
	OICs vs Industrial Labour Force Maximum, Unweighted				OICs vs Industrial Labour Force Maximum, Unweighted				NICs vs Industrial Labour Force Maximum, weighted			
GDP per capita	.235	26	.009	171.224	.035	13	.503	-61.889	.567	10	.004	328.932
Ind. Labour Force/GDP share	.288	27	.003	.0147	.397	13	.012	-.0111	.559	12	.002	.0213

REFERENCES

Abler, Ronald (1975) Effects of space-adjusting technologies on the human geography of the future. in R. Abler, D. Janelle, A. Philbrick, J. Sommer (eds) *Human Geography in a Shrinking World*, North Scituate, MA: Duxbury Press, 35-66.

Adelman, Irma (1984) Beyond export-led growth, *World Development*, 12: 937-949.

Adelman, Irma and Morris, Cynthia Taft (1997) Editorial: Development History and Its Implications, *World Development*, 25: 831-840.

Aero, Anders (1992) New pathways to industrialisation in Tanzania: Theoretical and strategic considerations, *Institute of Development Studies Bulletin*, 23.

Aglietta, Michel (1979) *A Theory of Capitalist Regulation*, London: New Left Books.

Aglietta, Michel (1998) Capitalism at the Turn of the Century: Regulation Theory and the Challenge of SocialChange, *New Left Review*, 232: 41-90.

Amin, Ash (1994a) Post-Fordism: Models, fantasies, and phantoms of transition, in A. Amin (ed) *Post-Fordism: A Reader*, Oxford: Blackwell, 1-39.

Amin, Ash (ed) (1994b) *Post Fordism: A Reader*, Oxford: Blackwell.

Amsden, Alice H. (1989) *Asia's Next Giant: South Korea and Late Industrialisation*, New York: Oxford University Press.

Amsden, Alice H. (1994) Why isn't the whole world experimenting with the East Asian model to develop? Review of *The East Asian Miracle*, *World Development*, 22:627-633.

Amsden, Alice H. (1995) Like the rest: South-east Asia's 'late' industrialization, *Journal of International Development*, 7: 791-799.

Amsden, Alice H. (1997) Editorial: Bringing production back in -- understanding government's economic role in late industrialisation, *World Development*, 25: 469-480.

Amsden, Alice H. and van der Hoeven, Rolph (1996) Manufacturing employment and real wages in the 1980s: Labour's loss until the century's end, *Journal of Development Studies*, 32: 506-530.

Auty, Richard M. (1995) Industrial policy, sectoral maturation, and post war economic growth in Brazil: the resource curse thesis, *Economic Geography*, 71: 257-72.

Baer, Werner and Herve, Michel E.A. (1966) Employment and Industrialization in developing countries. *Quarterly Journal of Economics*, 8:88-107.

Bagchi, Amiya Kumar (1989) Industrialization, in Eatwell, J., Milgate, M., and Newman, P. (ed) *The New Palgrave: Economic Development*, London: Norton, 160-173.

Bahmani-Oskooee, Mohsen; Mohtadi, Hamid and Shabsigh, Ghiath (1991) Export growth and causality in LDCs: A re-examination, *Journal of Development Economics*, 36:405-415.

Bairoch, Paul (1993) *Economics and world history: myths and paradoxes*, New York ; London: Harvester Wheatsheaf.

Bairoch, Paul and Limbor, J.M. (1968) Changes in the industrial distribution of the world labour force by region, 1880-1960, *International Labour Review*, 98: 311-336.

Bauer, Peter T. (1981) *Equality, the Third World and Economic Delusion*, London: Methuen.

Bauer, Peter T. (1984) *Reality and Rhetoric: Studies in the Economics of Development*, London: Weidenfeld & Nicholson.

Bauer, Peter T. and Yamey, B. (1957) *The Economics of Underdeveloped Countries*. Cambridge: Cambridge University Press.

Baumol, William, J. (1985) Productivity policy and the service sector, in R.P. Inman (ed) *Managing the Service Economy: Prospects and problems*, Cambridge: Cambridge University Press.

Baumol, William J., Nelson, Richard R., and Wolff, Edward, N. (1994) Introduction: The convergence of productivity, its significance, and its varied connotations, in (eds). W.J. Baumol et al (eds).

Baumol, William J., Nelson, Richard R., and Wolff, Edward, N. (eds) (1994) *Convergence of Productivity: Cross-National Studies and Historical Evidence*, Oxford: Oxford University Press.

Benería, Lourdes and Feldman, Shelly (eds) (1992) *Unequal Burden: Economic Crisis, Persistent Poverty, and Women's Work*, Boulder: Westview Press.

Bergsten, C. Fred (1988) Why the Asian monetary crisis? *EDI Forum*, Washington: World Bank, Economic Development Institute. 2(4), Spring 1998.

Bhabha, Homi (1990) The other question: difference, discrimination, and the discourse of colonialism, in R. Ferguson (ed) *Out There: Marginalization and Contemporary Cultures*, Cambridge: MIT Press.

Bhagwati, Jagdish N. (1978) *Foreign Trade Regimes and economic development: Anatomy and consequences of exchange and control regimes*,Cambridge, Mass: Ballinger.

Bhagwati, Jagdish N. (1988) *Protectionism*, Cambridge, Mass: MIT Press.

Birdsall, Nancy (1998) Life is unfair: Inequality in the world, *Foreign Policy*, Summer, 76-92.

Bloomfield, Gerald, T. (1994) *New Zealand: A Handbook of Historical Statistics*, Boston, Ma: G.K. Hall.

Borenstein, E. De Dregorio, J. and Lee, J-W (1998) How Does Foreign Direct investment Affect Economic Growth? *Journal of International Economic*, 45: 115-135.

Boyer, Robert. (1988) Technical change and the theory of `regulation', in G. Dosi, F. Freeman, R. Nelson, N. Silverberg, and L. Soete (eds) *Technical Change and Economic Development*, London: Pinter.

Boyer, Robert (1990) *The Regulation School: A Critical Introduction*, New York: Colombia University Press.

Brohman, John (1996a) Postwar development in the Asian NICs: Does the neoliberal model fit reality? *Economic Geography*, 72: 107-130.

Brohman, John (1996b) *Popular Development: Rethinking the Theory and Practice of Development*, Oxford: Blackwell.

Brookfield, Harold (1975) *Interdependent Development*, London: Methuen.

Bruton, John (1988) Import substitution as a development strategy, in H.B. Chenery and T.N. Srinivasan (eds) vol 2.

Cantwell, John (1995) The globalisation of technology: what remains of the product-cycle model? *Cambridge Journal of Economics*, 19: 155-174.

Carrillo J. (1995) Flexible production in the auto sector: Industrial reorganization at Ford-Mexico, *World Development*, 23: 87-101.

Casetti, Emilio (1972) Generating models by the expansion method: applications to geographic research, *Geographical Analysis*, 4: 81-91.

Castells, M. Goh, L. and Yin-wang Kwok, R. (1990) *The Shep Kip Mei Syndrome: Economic Development and Public Housing in Hong Kong and Singapore*, London: Pion.

Cawthorne, P.M. (1995) Of networks and markets: The rise and rise of a south Indian town, the example of Tiruppur's cotton knitwear industry. *World Development*, 23: 43-55.

Chambers, Richard (1983) *Rural Development: Putting the Last First*, Essex: Longman.

Chambers, Richard (1985) Putting the last first; a professional revolution, *Third World Affairs*, 4: 78-94.

Chari, Sharad (1997) Agrarian questions in the making of the knotwear industry in Tirupur, India, in D. Goodman and M. Watts (eds) *Globalising Food: Agrarian Questions and Global Restructuring*, London: Routledge.

Chenery, Hollis B. (1960) Patterns of industrial growth, *American Economic Review*, 50: 624-654.

Chenery, Hollis B. (1988) Structural Transformation: Introduction, in H.B. Chenery and T.N. Srinivasan (eds) vol. 1, 197-202.

Chenery, Hollis B., Robinson, Sherman and Syrquin, Moishe (1986) *Industrialisation and Growth: A Comparative Study*, New York: Oxford University Press.

Chenery, Hollis B. and Srinivasan, T.N. (1988) *Handbook of Development Economics*, Amsterdam: North Holland.

Chenery, Hollis B. and Syrquin, Moshe (1975) *Patterns of Development 1950-1970*, London: Oxford University Press.

Chenery, Hollis B. and Syrquin, Moshe (1986) The semi-industrial countries, in Chenery et al (eds), 85-120.

Chenery, Hollis B. and Taylor, Lance (1968) Development patterns among countries and over time, *Review of Economic and Statistics*, 50: 391-416.

Clark Colin (1940) *The Conditions of Economic Progress*, 2nd edition (1957) London: MacMillan.

Clark, Don P. (1995) Trade orientation and industrial sector growth in developing countries, *The Journal of Developing Areas*, 30: 1-10.

Clark, Gordon L. (1994) The end of an era: Asian NIEs in the global economy, *Growth and Change*, 25: 487-508.

Clark, Gordon, L. and Kim, W.B. (eds) (1995) *Asian NIEs and the global economy: Industrial restructuring and corporate strategy in the 1990s*, Baltimore: John Hopkins.

Cline, William, R. (1982) Can the East Asian model be generalized? *World Development*, 10:81-90.

Cobb, Cliffird,Halstead, Ted, and Rowe, Jonathan (1995) If the GDP is up, Why is America down? *Harpers*, August.

Comaroff, Jean and Comaroff, John (1991) *Of revelation and revolution*, Chicago: University of Chicago Press.

Cooper, Frederick, and Packard, Randall (1997) *International Development and the Social Sciences: Essays on The History and Politics of Knowledge*, Berkeley: University of California Press.

Corbridge, Stuart (1992) Discipline and punish: the new right and the policing of the international debt crisis, *Geoforum*, 23: 285-301.

Corbridge, Stuart (1993) Marxisms, modernities, and moralities: development praxis and the claims of distant strangers, *Environment and Planning D*, 11: 449-472.

Corbridge, Stuart (1998) Beneath the pavement Only soil: the Poverty of Post-Development, *Journal of Development Studies*, 6: 138-148.

Corsetti, Giancardo; Pesenti, Paolo, and Roubini, Nouriel (1998a) Fundamental determinants of the Asia Crisis: A preliminary empirical assessment, prepared for JIMF Fordham Unversity Confernece on 'Perspectives on the Financial Crisis in Asia', June 1998, revised November 1998, at Roubini (no date).

Corsetti, Giancardo; Pesenti, Paolo, and Roubini, Nouriel (1998b) What caused the Asian currency and financial crisis? Part II, the policy debate, presented at the CEPR-World Bank conference on 'Financial Contagion and Market Volatility', May 1998, revised September, 1998, at Roubini (no date).

Crush, Jonathan (1995) *The Power of Development*, London: Routledge.

Dahl, G. and Rabo, A. (1992) *Kam-Ap or Take-Off: Local Notions of Development*, Stockholm: Stockholm Studies in Social Anthropology.

Daly, Herman E. and Cobb, John B. (1994) *For the Common Good: Redirecting the Economy toward Community, the Environment, and a Sustainable Future*, Boston: Beacon.

Danmarks Statistik (1996) *Statistic Årbog*, Copenhagen.

De Mello, Luiz R. (1997) Foreign direct investment in developing countries and growth: A selective survey, *Journal of Development Studies*, 34: 1-34.

Dicken, Peter (1998) *Global Shift*, 3nd edition, New York: Guilford

Dodero, Santos (1991) Comparative advantage, trade and growth: Export-led growth revisited, *World Development* 19: 1153-1165.

Dodero, Santos (1993) Exports and growth: A reconsideration of causality, *Journal of Development Areas*, 27: 227-244.

Dornbusch, Rudi (1998) Review: Soros, George (1998) *The Crisis of Global Capitalism: Open Society Endangered*, at Roubini, Nouriel (no date) *Asian Currency and Finacial Crisis*, Bibliography and Document Links, website

Dosi, Giovanni; Freeman, Christopher; Nelson, Richard; Silverberg, N.; and Soete, Luc (eds) (1988) *Technical Change and Economic Development*, London: Pinter.

Douglass, M. (1992) Global opportunities and local challenges for regional economies, *Regional Development Dialogue*, 13: 3-21.

Drucker, Peter F. (1993) *Post-Capitalist Society*, New York: HarperBusiness.

Dunford, M. (1990) Theories of regulation, *Environment and Planning D*, 8: 297-321.

Dutt, Amitava Krishna (1997) The patterns of direct foreign investment and economic growth, *World Development* 25: 1925-1936.

Dutt, Swarna, D. and Ghosh, Dipak (1996) The export growth-economic growth nexus: A causality analysis, *The Journal of Developing Areas*, 30: 167-182.

Eckhaus, Richard S. (1978) Review of Chenery and Syrquin (1975), *Economic Development and Cultural Change*, 26: 621-625.

Economic Commission for Latin America (1957) Changes in Employment Structure for Latin America, 1944-55, *Economic Bulletin for Latin America*, 2:15-42.

Economist (1994) War of the Worlds: A Survey of the World Economy, 7 October 1994.

Economist (1996) June 22.

Edwards, Michael (1989) The irrelevance of development studies. *Third World Quarterly*, Fisher, Allan J.B. (1939) Production, primary, secondary, and tertiary, *Economic Record*, 15: 24-38.

Edwards, Michael and Hulme, David (1992) *Making a Difference: NGOs and Development in a Changing World*, London: Earthscan.

Elam, Mark (1994) Puzzling out the post-Fordist debate: Technology, markets and institutions, in A. Amin (ed)

Emmerij, Louis (1994) The employment problem and the international economy, *International Labour Review*, 133: 449-446.

Emmerij, Louis (1997a) *Economic and Social Development into the XXI Century*, Washington, DC: John Hopkins and Inter-American Development Bank.

Emmerij, Louis (1997b) Development thinking and practice: Introductory essay and policy conclusions, in Emmerij (ed), 3-38.

Ettlinger, Nancy (1994) The localisation of development in comparative perspective, *Economic Geography*, 70: 144-166.

Escobar, Arturo (1992) Reflections on 'development': Grassroots approaches and alternative politics in the Third World, *Futures*, 24:411-36.

Escobar, Arturo (1995) *Encountering Development: The Making and Unmaking of the Third World*, Princeton: Princeton University Press.

Esser, Josef and Hirsch, Joachim (1994) The crisis of Fordism and the dimensions of a "post-Fordist' regional and urban structure, in A. Amin (ed).

Estava, Gustavo and Mahhu, Suri Prakash (1998) *Grassroots Post-Modernism: Remaking the Soil of Cultures*, London: Zed.

Evans D. and Alizadeh, P. (1984) Trade industrialization and the visible hand, *Journal of Development Studies*, 21:

Fals Borda, Orlando (1990) *Knowledge and Social Movements*, Latin American Studies Programme, University of California, Santa Cruz: Merril Publications.

Feder, Gershon (1983) On exports and economic growth, *Journal of Development Economics*, 12: 59-74.

Feder, Gershon, (1986) Growth in semi-industrial countries: a statistical analysis, in Chenery et al.

Ferguson, James (1990) *The Anti-politics Machine: "Development", Depoliticization, and Bureaucratic Power in Lesotho*, Cambridge: Cambridge University Press.

Fernald, John; Edison, Hali, and Loungani, Prakash (1998) Was China the first domino? Assessing the links between China and the rest of emerging Asia, International Finance Discussion Paper # 604, Washington: Board of Governors of the Federal Reserve System.

Fisher, A.G.B. (1939) Production, primary, secondary and tertiary, *Economic Record*, 15:24-38.

Foray, D. (1993) General Introduction, in Foray, D. and Freeman, C. *Technology and the Wealth of Nations: The Dynamics of Constructed Advantage*, London: Pinter and OECD.

Fourastie, J. (1949) *Le grande espoire de XX siecle.* Paris: Presses Universitaires de France.

Freeman, Christopher (1982) *The Economics of Industrial Innovation*, London: Pinter.

Freeman, Christopher and Hagedoorn, J. (1994) Catching-up or falling behind? Patterns in international interfirm technology partnering, *World Development*, 22: 771-780.

Friere, Paulo (1970) *Pedagogy of the Oppressed*, New York: Herder and Herder.

Fröbel, F. Heinrichs, J. and Kreye, O. (1980) The New International Division of Labour, Cambridge: Cambridge University Press.

Fugelsang, Minou (1992) No longer ghosts: Women's notions of "development" and "modernity" in Lamu Town, Kenya, in G. Dahl and A. Rabo (eds).

Gershenkron, Alexander. (1962) *Economic Backwardness in Historical Perspective*, Cambridge, Mass.: Harvard University Press.

Gertler, Meric, S. (1988) The limits of flexibility: comments on the post-Fordist vision of production and its geography, *Transactions, Institute of British Geographers*, 13: 413-432.

Gertler, Meric S. (1992) Flexibility revisited: districts, nation states, and the forces of production. *Transactions, Institute of British Geographers*, 17: 259-278.

Gillis, Malcolm; Perkins, Dwight H; Roemer, Michael and Snodgrass, Donald R. (1992) *Economics of Development*, 3rd edition, New York and London: W.W. Norton & Company

Glasmeier, A.K. (1994) Flexibility and adjustment: the Hong Kong watch industry and global change, *Growth and Change*, 25: 223-246.

Globe and Mail (1996) Developing nations still have tough row to hoe, Oxford Analytica, 27 May 1996.

Globe and Mail (1998) World Bank questions IMF, 8 January 1998.

Grabowski, Richard (1994) Import-substitution, export promotion, and the state, *Journal of Developing Areas*, 28: 535-554.

Gough, Jamie (1998) and Eisenschitz, Aram (1998) The Construction of mainstream local economic initiatives: Mobility, Socialisation, and Class Relations, *Economic Geography*, 74: 178-195.

Greenaway, David and Morgan, Wyn (1997) Trade liberalisation and growth in developing countries: some new evidence, *World Development*, 25: 1985-1892.

Gudeman, Stephen (1992) Remodelling the house of economics, Culture and Innovation, *American Ethnologist*, 19: 141-154.

Hansohm, Dirk (1992) Small enterprise flexibility in Sudan, *Institute of Development Studies Bulletin*, 23.

Hart-Landsberg, Martin and Burkett, Paul (1998) Contradictions of capitalist industrialisation in East Asia: A critique of the 'Flying Geese' theories of development, *Economic Geography*, 74: 87-110.

Hay, Colin (1995) Re-stating the problem of regulation and re-regulating the local state, *Economy and Society*, 24: 387-407.

Helleiner, Gerald, K. (ed) (1992) *Trade Policy, Industrialization and Development*, Oxford: Clarendon Press.

Helleiner, Gerald, K. (ed) (1994) Introduction, *Trade Policy and Industrialization in Turbulent Times*, London: Routledge, 1-36.

Helleiner, Gerald, K. (ed) (1995) Introduction, *Manufacturing for Export in the Developing World*, London: Routledge, 1-20.

Henderson, Jeffrey (1993) Against the economic orthodoxy: On the making of the East Asian miracle, *Economy and Society*, 22: 200-217.

Hettne, Bjorn (1995) *Development Theory and the Three Worlds*, 2nd editon, New York: London.

Hettne, Bjorn (1992) The future of development studies, Paper presented at the 40th anniversary of ISS, October 1992 [cited in H. Holmén and M. Jirström (1994)].

Hikino, Takashi and Amsden, Alice H. (1994) Staying behind, stumbling back, sneaking up, soaring ahead: Late industrialisation in historical perspective, in W.J. Baumol et al (eds).

Hilhorst, Jos G.M. (1998) Industrialisation and local/regional development revisited, *Development and Change*, 29: 1-26.

Hirschman, Albert O. (1958) *The Strategy of Economic Development*, New Haven: Yale University Press.

Hirschman, Albert O. (1981) A generalized linkage approach to development with special reference to staples, in *Essays in Trespassing: Economics to Politics and Beyond*, Cambridge: Cambridge University Press, 59-97.

Hirst, Paul and Zeitlin, Jonathon (1991) Flexible specialisation versus post-Fordism: theory, evidence, and policy implications, *Economy and Society*, 20:1-156

Hoffman, K. and Kaplinsky, R. (1988) *Driving Force: The Global Restructuring of Technology, Labour and Investment in the Automobile and Components Industries* Boulder: Westview.

Holmén, Hans and Jirström, Magnus (1994) Old wine in new bottles? Local organizations a panacea for sustainable development, in H. Holmén and M. Jirström (eds) *Ground Level Development: NGOs, Co-operatives and Local Organizations in the Third World*, Lund: Lund University Press.

Humphrey, John (ed) (1995a) Industrial organisation and manufacturing competitiveness in developing countries, Intorduction, *World Development*, 23: 1-7.

Humphrey, John (1995b) Industrial reorganisation in developing countries: From models to trajectories, *World Development*, 23: 149-162.

Humphrey, John and Schmitz, Hubert (1996) The triple C approach to local industrial policy, *World Development*, 24:1859-1877.

Hunt, Diana (1989) *Economic Theories of Development: An Analysis of Competing Paradigms*, Savage, Maryland: Barnes and Noble.

Ingalls, Gerald H. and Martin, Walter E. (1988) Defining and identifying NICs, in J. Norwine and A Gonzalez (eds) *The Third World: State of Mind and Being*, London: Unwin Hyman, 82-98.

Innis, Harold A. (1930) *The Fur Trade in Canada: an Introduction to Canadian Economic History*, Toronto: Prentice.

Institute of Development Studies Bulletin, (1992) Flexible specialisation: A new view on small industry? 23.

International Labour Organisation (1978) *Employment, Growth and Basic Needs: A One-world problem*, 2nd edition, Geneva: ILO.

International Labour Organization (1995a) Estimated rates of activity: Asian countries and territories (1950-1990), *Bulletin of Labour Statistics*, 1995-1.

International Labour Organization (1995b) Estimated rates of activity: African countries and territories (1950-1990), *Bulletin of Labour Statistics*, 1995-2.

International Labour Organization (1995c) Estimated rates of activity: Latin American countries and territories (1950-1990), *Bulletin of Labour Statistics*, 1995-3.

International Labour Organization (1995d) Estimated rates of activity: Countries and territories of North America, Europe and Oceania (1950-1990), *Bulletin of Labour Statistics*, 1995-1.

International Monetery Fund (1997) *World Economic Outlook*, May 1997, Washington D.C.: IMF.

Jessop, Bob (1994) Post-Fordism and flexible specialisation: incommensurable contradictory, complementary, or just plain different perspectives? in H. Ernste and V. Meier (eds) *Regional Development and Contemporary Industrial Response: Extending Flexible Specialisation*, London: Belhaven Press, 24-44.

Jessop, Bob (1994) Post-Fordism and the state, in A. Amin (ed).

Jessop, Bob (1995) The regulation approach, governance, and post-Fordism: alternative perspectives in economic and political change, *Economy and Society*, 24: 307-333.

Jones, John Paul III and Emilio Casetti (eds.) *Application of the Expansion Method*, London and New York: Routledge.

Julius, D. and Brown, R. (1993) Is manufacturing still special in the new world order? *The 1993 Amex Bank Review*, London: Amex Bank [in Weicjorek, 1994].

Jung, Woo S. and Marshall, Peyton (1985) Exports, growth and causality in developing countries, *Journal of Development Economics*, 18: 1-12.

Kaplinsky, Raphael (1988) Restructuring the capitalist labour process: implications for administrative reform. *Institute of Development Studies, Bulletin*, 19: 42-49.

Kaplinsky, Raphael (1991) Direct foreign investment in Third World manufacturing: is the future an extension of the past? *Institute of Development Studies, Bulletin* 22: 29-35.

Kaplinsky, Raphael (1995) Technique and system: The spread of Japanese management techniques to developing countries, *World Development*, 23: 57-71.

Kattuman, Paul (1994) The role of history in the transition to an industrial district: the case of the Indian bicycle industry, Paper presented at the workshop on Flexible Specialisation in India (Pondicherry) The French Institute at Pondicherry, March 25-26 [cited in Humphrey 1995b].

Kavoussi, Rostam (1994) Export expansion and economic growth: Further empirical evidence, *Journal of Development Economics*, 14: 241-250.

Kawai, Hiroki (1994) International comparative analysis of economic growth: Trade liberalization and productivity, *The Developing Economies*, 32: 371-397.

Killick, Tony (1995) Flexibility and economic progress, *World Development*, 23: 721-734.

Knox, Paul L. and Agnew, John A. (1994) *The Geography of the World Economy: An Introduction fo Economic Geography* , 2nd edition, London: Arnold.

Kregel, Jan (1998) East Asia is not Mexico: The difference between balance of payments crises and debt deflation, Working Paper No. 235, Jerome Levy Economic Institute.

Krueger, Anne (1978) *Foreign Trade Regimes and Economic Development: Liberalization Attempts and Consequences*, Cambridge, Mass: Ballinger.

Krugman, Paul (1994) The myth of Asia's miracle, *Foreign Affairs*, 73(6) 62-78.

Krugman, Paul (1997) I told you so, *New York Times Magazine*, May 5.

Krugman, Paul (1998) The confidence game, *The New Republic*, 5 October .

Kubo, Yuji; De Melo, Jaime, and Robinson, Sherman (1986) Trade strategies and growth episodes, in Chenery, H. and Syrquin, M. (eds) *Industrialisation and Growth: A Comparative Study*

Kulick, Don (1992) "Coming up" in Gapun: Conceptions of development and their effect on language in a Papua New Guinean village. In G, Gahl and A. Rabo (eds).

Kuznets, Paul W. (1988) An East Asian model of economic development: Japan, Taiwan and South Korea. *Economic Development and Cultural Change*, 36: 11-34.

Kuznets, Simon (1957) Quantitative Aspects of the Economic Growth of Nations, II Industrial Distribution of National Product and Labour Force, *Economic Development and Cultural Change*, supplement.

Kuznets, Simon (1959) On comparative study of economic structure and growth of nations, in National Bureau of Economic Research, *The Comparative Study of Economic Growth and Structure*, New York: NBER.

Kuznets, Simon (1966) *Modern Economic Growth*, New Haven: Yale University Press.

Kuznets, Simon (1971) *Economic Growth of Nations: Total Output and Production Structure*, Cambridge, MA: Harvard University Press.

Lipietz, A. (1987) *Mirages and Miracles: the Crises of Global Fordism*, London: Verso.

Kwon, Jene (1994) The East Asian challenge to neoclassical orthodoxy, *World Development*, 22: 635-644.

Lall, Sanjaya (1994) *The East Asian Miracle*: Does the bell toll for industrial strategy? *World Development*, 22: 645-654.

Lall, Sanjaya and Latsch, Wolfram (1998) Import liberalisation and industrial performance: The conceptual underpinnings, *Development and Change*,29: 437-465.

Lefeber, L. (1974) On the paradigm for economic development, A. Mitra (ed) *Economic theory and Planning*, Oxford: Oxford University Press.

Lehmann, David (1990) *Democracy and Development in Latin America*, Philadelphia: Temple University Press.

Lewis, W. Arthur (1955) *The Theory of Economic Growth*, Boston: Allen and Unwin.

Levine, R. and Renelt, D. (1992) A sensitivity analysis of cross-country growth regressions, *American Economic Review*, 82: 946-963.

Lim, David (1994) Explaining the growth performance of Asian developing economies, *Economic Development and Cultural Change*, 38:829-844.

Lim, J.D. (1994) Restructuring of the footwear industry and the industrial adjustment of the Pusan economy, *Environment and Planning A*, 26: 567-581.

Lipton, Michael (1977) *Why the Poor Stay Poor*, London: Maurice Temple Smith.

Little, Ian M.D, Scitovsky, Tibor and Scott, Maurice F.G. (1970) *Industry and Trade in Some Developing Countries*, Oxford: Oxford University Press for OECD, Paris.

Lo, Dic (1995) Techno-economic paradigm versus the market: on recent theories of late industrialisation, *Economy and Society*, 24:443-470.

MacLeod, Gordon (1997) Globalising parisian thought-waves: recent advances in the study of social regulation, politics, discourse and space, *Progress in Human Geography*, 21: 530-553.

Maddison, Angus (1989) *The World Economy in the 20th Century*, Paris: OECD.

Maddison, Angus (1995) *Monitoring the World Economy*, Development Centre Studies, The Organisation for Economic Co-operation and Development, Paris: OECD.

Malecki, Edward J. (1991) *Technology and Economic Development*, New York: Longman.

Mallick, R. and Carayannis, E.G. (1994) Regional economic convergence in Mexico: and analysis by industry, *Growth and Change*, 25: 325-334.

Markusen, Ann R. (1986) Defense spending: a successful industrial policy? *International Journal of Urban and Regional Research*, 10: 105-22.

Minford, Patrick; Riley, Jonathan and Nowell, Eric (1997) Trade, Technology and labour Markets in the World Economy, 1970-90: A computable general equilibrium analysis, *Journal of Development Studies*, 34: 1-34.

Mitchell, Brian (1992) *International Historical Statistics - Europe 1750-1988*, 2nd edition, London: MacMillan.

Mitchell, Brian (1994) *International Historical Statistics - The Americas 1750-1988*, 2nd edition, London: MacMillan.

Mitchell, Brian (1992) *International Historical Statistics - Africa, Asia, and Oceania 1750-1988*, 2nd edition, London: MacMillan.

Morawetz, David (1974) Employment implications of industrialization in developing countries, *Economic Journal*, 84: 491-452.

Myrdal, Gunnar (1957) *Economic theory and Underdeveloped Countries*, London: Duckworth.

Nadvi, Khalid and Schmitz, Hubert (1994) Industrial clusters in less developed economies: review of experiences and research agenda. Discussion paper No. 339, Brighton: Institute of Development Studies.

Nandy, Ashis (1987) *Traditions, Tyranny, and Utopias*, Delhi: Oxford University Press.

Nandy, Ashis (1989) Shamans, savages, and the wilderness: On the audibility of dissent and the future of civilizations, *Alternatives*, 14: 263-78.

Nederveen Pieterse, Jan (1997) Going global: futures of capitalism, *Development and Change*, 28: 367-382.

Nederveen Pieterse, Jan (1998) My paradigm or yours? Alternative development, post development, reflexive development, *Development and Change*, 29: 343-373.

New York Times (1999) Crash Course: Just What's Driving the Crisis in Emerging Markets, 29 January.

O'Connor, James (1993) Capitalism, Nature, Socialism: A Theoretical Introduction, *Capitalism, Nature, Socialism*1: 11-38.

Oman, C. (1991) Trends in global FDI and Latin America, Paper Prepared for the Inter-American Dialogue Meeting, Washington, D.C. 18-20 December [cited in Rogerson, 1994].

Organisation for Economic Co-operation and Development (OECD) Statistics Directorate (1982-1995) *Historical Statistics 1960 -1993*, (various) Paris: OECD.

Organisation for Economic Co-operation and Development (1991) *Technology in a Changing World*, Paris: OECD.

Organisation for Economic Co-operation and Development (1992) *Technology and the Economy: The Key Relationships*, Paris: OECD.

Organisation for Economic Co-operation and Development (1993) *What Future for Our Countryside? A Rural Development Policy*, Paris: OECD.

Organisation for Economic Co-operation and Development (1995) *The OECD Jobs Study: Investment, Productivity, Employment*, Paris: OECD.

Pack, Howard (1988) Industrialisation and trade, in H.B. Chenery and T.N. Srinivasan (eds) vol. 1, 333-380.

Pack, Howard (1992a) Learning and productivity change in developing countries, Helleiner, Gerald, K. (ed) *Trade Policy, Industrialization and Development.*

Pack, Howard (1992b) Technology gaps between industrial and developing countries: Are there dividends for latecomers? Proceedings of the World Bank Annual Conference on Development Economics 1992. *World Bank Economic Review, Supplement*, 283-302.

Painter, Joe and Goodwin, Mark (1995) Local governance and concrete research: investigating the uneven development of regulation, *Economy and Society*, 24: 334-356.

Pandit, Kavita (1987) *Temporal and Spatial Variation in Sectoral Labor Allocation During Development*, PhD dissertation, Ohio State University.

Pandit, Kavita and Casetti, Emilio (1989) The shifting patterns of sectoral labour allocation during development: Developed versus developing countries, *Annals of the Association of America Geographers*, 79: 329-344.

Pandit, Kavita (1992) An exploration of the relationship between secoral labor shares and economic development, in J.P. Jones III and E. Casetti (eds.)

Park, S.O. (1994) Industrial restructuring in the Seoul metropolitan region: major triggers and consequences, *Environment and Planning A*, 26: 527-541.

Park, S.O. (1994) Seoul (Korea): City and suburb. In Clark, G.L. and Kim W.B. (eds) *Asian NIEs and the global economy.*

Penn World Tables, Mark 5.6 (1992) latest version of Summers and Heston's data for international comparisons extracted from *National* [U.S.] *Bureau of Economic Research* (NBER), web-site: http://www.nber.org, Cambridge, Massachussets.

Perez, C. (1983) Structural change and the assimilation of new technologies in the economic and social system. *Futures*, 15: 357-75.

Perkins, Dwight H. (1994) there are at least three models of East Asian development, *World Development*, 22: 655-661.

Pigg, Stacy Leigh (1992) Constructing social categories through place: Social representations and development in Nepal, *Comparative Studies in Society and History*, 34: 491-513.

Piore, Michael, and Sabel, Charles (1984) *The Second Industrial Divide*, New York: Basic Books.

Polanyi, Karl (1957) The economy as instituted process, in K. Polanyi, C. Arensberg, and H. Pearson (eds) *Trade and Market in the Early Empires*, Glencoe: Free Press.

Pollard, Jane and Storper, Michael (1996) A tale of twelve cities: metropolitan employment change in dynamic industries in the 1980s, *Economic Geography*, 72: 1-22.

Pollert, A. (1988) Dismantling flexibility, *Capital and Class*, 34: 42-75.

Pollert, A (1991) The orthodoxy of flexibility, in A. Pollert (ed) *Farewell to Flexibility?* Oxford: Blackwell.

Poon, Jessie (1994) Export growth, economic growth, and development levels: An empirical analysis, *Quantitative Geography*, 26: 37-53.

Porter, Philip W. and Sheppard, Eric S. (1998) *A World of Difference: Society, Nature, Development*, New York: Guilford.

Porter, Michael (1990) *The Competitive Advantage of Nations*, New York: Free Press.

Posthuma, A.C. (1995) Japanese techniques in Africa? Human resources and industrial restructuring in Zimbabwe, *World Development*, 103-116.

Prebisch, Raoul (1962 [1949]) The economic development of Latin America and its principal problems. *Economic Bulletin of Latin America*, 7:1-22.

Rabellotti, R. (1995) Is there an "industrial district model"? Footwear districts in Italy and Mexico compared. *World Development*, 23:29-41.

Ram, R. (1985) Export and economic growth: some additional evidence, *Economic Development and Cultural Change*, 33: 59-74.

Ram, R. (1987) Exports and Economic Growth in developing countries: Evidence from time series and cross-section data. *Economic Development and Cultural Change*, 24: 51-70.

Rasmussen, Jesper, Schmitz, Hubert, and van Dijk, Meine Peiter (1992) Introduction: Exploring a new approach to small-scale industry, *Institute of Development Studies Bulletin*, 23:2-7.

Ravillion, Martin (1997) Good and bad growth: the Human Development Reports, *World Development*, 25: 631-638.

Reynolds, Lloyd C. (1965) Wages and employment in a labor-surplus economy. *American Economic Review*, 55: 19-39.

Richards, P. (1985) *Indigenous Agricultural Revolution*, London: Century Hutchison.

Rist, Gilbert (1997) *The History of Development: From Western Origins to Global Faith*, London: Zed.

Robinson, Mark (1992) NGOs and rural poverty alleviation: implications for scaling-up, in M. Edwards and D. Hulme (eds).

Rodrik, Dani (1992) Closing the productivity gap? Does trade liberalization really help? in Helleiner, Gerald, K. (ed) (1992) *Trade Policy, Industrialization and Development.*

Rogerson, Christian M. (1994) Flexible production in the developing world: the case of South Africa, *Geoforum*, 25: 1-17.

Romer, P.M. (1993) Idea gaps and object gaps in economic development, *Journals of monetery Economics*, 32: 543-573.

Roubini, Nouriel (no date) *Asian Currency and Finacial Crisis*, Bibliography and Document Links, website at: http://www,stern.nyu/edu/~nroubini/asia/AsiaHomepage.html.

Rosenstein-Rodan, P. (1943) Problems of industrialisation of Eastern and South-eastern Europe. *Economic Journal*, 53:202-11.

Rostow, Walt W. (1960) *The Stages of Economic Growth: A Non-Communist Manifesto*, 2nd edition (1971), 3rd edition (1990), Cambridge: Cambridge University Press.

Sachs, Wolfgang (ed) (1992) *The Development Dictionary: A Guide to Knowledge as Power*, Johannesburg: Witwatersrand.

Sagasti, Fancisco (1997) Editorial: Development, knowledge, and the Baconian Age, *World Development*, 25: 1561-1568.

Said, Edward (1979) *Orientalism*, New York: Vintage Books.

Salvatore, D. and Hatcher, Thomas (1991) Inward oriented and outward oriented trade strategies, *The Journal of Development Studies*, 27: 7-25.

Schmitz, Hubert (1990) Small firms and flexible specialization in developing countries, *Labour and Society*, 15:

Schmitz, Hubert (1992) On the clustering of small firms, Institute of Development Studies Bulletin, 23.

Schmitz, Hubert and Musyck, Bernard (1994) Industrial districts in Europe: Policy lessons for developing countries? *World Development*, 22: 889-910.

Schumpeter, Joseph (1934 [1911]) *The Theory of Economic Development*, Cambridge, Mass.: Harvard University Press.

Science Council of Canada and Canadian Advanced Technology Association (1990) *Firing Up the Technology Engine: Strategies for Community Economic Development*. Ottawa: Ministry of Supply and Services.

Scott, Allen J. (1992) The collective order of flexible production agglomerations: lessons for local economic development policy and strategic choice, *Economic Geography*, 68: 219-233.

Selya, Roger M. (1993) Economic restructuring and spatial changes in manufacturing in Taiwan, 1971-1986, *Geoforum*, 24: 115-126.

Selya, Roger M. (1994) Taiwan as a service economy, *Geoforum*, 25: 305-322.

Sheehey, Edmond (1990) Exports and growth: A flawed framework, *The Journal of Development Studies*, 27:

Smyth, Ines (1992) Collective efficiency and selective benefits: the growth of the rattan industry of Tegalwangi (Indonesia), *Institute of Development Studies Bulletin*, 23.

Singer, Hans W. (1950) The distribution of gains between investing and borrowing countries, *American Economic Re view*, 40:

Singer, Hans W. (1979) Policy implications of the Lima target, *Industry and Development*, 3: 17-32.

Soros, George (1998) *The Crisis of Global Capitalism: Open Society Endangered*, New York: Public Affairs.

Späth, Brigitte (1992) The institutional environment and communities of small firms, *Institute of Development Studies Bulletin*, 23.

Spivak, G.C. (1990) *The Post-Colonial Critic: Interviews, Strategies, Dialogues*, Andover: Routledge.

Statistics Canada (1983) *Historical Statistics of Canada, 2nd edition*, F.H. Leary (ed) Ottawa: Statistics Canada.

Statistics Canada (1994-98) *Historical Labour Force Statistics*, (annual) Ottawa: Ministry of Industry.

Strathern, Marilyn (1988) *The Gender of the Gift*, Berkeley: University of California.

Storper, Michael, (1990) Industrialization and the regional question in the third world: lessons of postimperialism; prospects of post-Fordism? *International journal of urban and regional research*, 14: 423-444.

Storper, Michael. (1991) *Industrialisation, Economic Development, and the Regional Question in the Third World*, London: Pion.

Streeten, Paul (1997) Globalization and competitiveness: Implications for development thinking and practice? in Emmerij (ed), 107-106.

Suisse, Office Féderal de la Statistique (1980) Annuaire Statistique de la Suisse, Editions Birkhäuser, Basel.

Summers, Robert and Alan Heston (1991) The Penn World Table (Mark 5): An expanded set of internatioal comparisons, 1950-1988, *The Quarterly Journal of Economics*, May 1991.

Sverrisson, Arni (1992) Flexible specialisation and woodworking enterprises in Kenya and Zimbabwe, *Institute of Development Studies Bulletin*, 23.

Syrquin, Moshe (1988) Patterns of Structural Change in H.B. Chenery and T.N. Srinivasan (eds) vol. 1, 203-273.

Syrquin, Moshe (1994) Growth and Industrialisation since 1965: A comparative study of fourteen countries, in G.K. Helleiner (ed) *Trade Policy and Industrialization in Turbulent Times*, 37-59.

Syrquin, Moshe and Chenery, Hollis B. (1989) Three decades of industrialization, *The World Bank Economic Review*, 3:145-181.

Taiwan, Director General of the Budget, Accounting and Statistics (1995-6) *Statistical Yearbook of the Republic of China*, Taiwan:

Taylor, Lance (1969) Development patterns: a simulation study, *Quarterly Journal of Economics*, 83: 220-241.

Thomas, Alan (1994) *Third World Atlas*, Washington: Taylor and Francis.

Tickell, Adam and Peck, Jamie A. (1992) Accumulation, regulation and the geographies of post-Fordism: missing links in regulationist research. *Progress in Human Geography*, 16: 190-218.

Tickell, Adam and Peck, Jamie A. (1995) Social regulation *after* Fordism: regulation theory, neo-liberalism and the global-local nexus, *Economy and Society, 24:357-386.*

Timmer, C. Peter (1988) The agricultural transformation, in H.B. Chenery and T. N. Srinivasan (eds) vol. 1, 275-331.

Todaro, Michael P. (1977) *Economic Development*, Reading, Mass: Addison

Toye, John (1993) *Dilemmas of Development: Reflections on the Counter-Revolution in Development*, Oxford: Blackwell.

Tyler, William (1981) Growth and export expansion in developing countries, *Journal of Developing Economies*, 9:

United States. Bureau of Labour Statistics (1997) National Employment, Hours, and Earnings Series,

Vernon, R. (1966) International investment and international trade in the product cycle, *Quarterly Journal of Economics*, 80: 190-207.

Verspagen, Bart (1993) *Uneven growth between interdependent economies*, Aldershot: Avesbury.

Vogel, S.J. (1994) Structural changes in agriculture: Production linkages and agricultural demand-led industrialisation, *Oxford Economic Papers*, 46: 136-56.

Vollrath, T.L. (1994) The role of agriculture and its prerequisites in economic development, *Food Policy*, 19: 469-478.

Wade, Robert (1990) *Governing the Market: Economic Theory and the Role of Government in East Asian Industrialisation*. Princeton, N.J.: Princeton University Press.

Wade, Robert (1995) The East Asian miracle: Why the controversy continues, in UNCTAD *International Monetary and Financial Issues for the 1990s*, research Papers for the Groups of Twenty-Four, V Geneva: UNCTAD.

Wade, Robert (1998a) The Asian Crisis andCapital Triumphalism, speech dilivered to the Overseas Development council, 19 March, at http://www.odc.org/commentary/rwspeech.html.

Wade, Robert (1998b) The Asian debt-and-development crisis of 1997-?: Causes and Consequences, *World Development*, 26: 1535-1553.

Wade, Robert and Veneroso, Frank (1998) The Asian crisis: the high debt model versus the Wall Street-Treasury-IMF complex, *New Left Review*, 228: 3-22.

Watkins, Mel (1962) A staple theory of economic growth, *Canadian Journal of Economics and Political Science*, 29:141-58.

Weiczorek, Jaroslaw (1995) Sectoral trends in world employment and the shift towards services, *International Labour Review*, 134: 205-226.

Wilson, Fiona (1992) Modern workshop industry in Mexico: on its way to collective efficiency, *Institute of Development Studies Bulletin*, 23.

Williamson, John (1997) The Washington consensus revisited, in Emmerij (ed), 48-61.

Wolfensohn, James D. (1998) *The Other Crisis*, President, the World Bank Group, address to the Board of Governors, 6 October, Washington DC.

Wood, Adrian and Berge, Kerti (1997) Exporting manufactures: Humand resources, natural resources,and trade policy, *Journal of Development Studies*, 34: 35-59.

World Bank (1983) *World Tables*, Washington, D.C.: World Bank.

World Bank (1987) *World Development Report: Barriers to Adjustment and Growth in the World Economy*, New York: Oxford University Press.

World Bank (1991) *World Development Report: The Challenge of Development*, New York: Oxford University Press.

World Bank (1993) *The East Asian Miracle: Economic Growth and Public Policy*, New York: Oxford University Press.

World Bank (1995a) *World Development Report: Workers in an Integrating World*, New York: Oxford University Press.

World Bank (1995b) *World Bank Indicators on CD-ROM*, Washington: The World Bank.

World Bank (1997a) *World Development Indicators*, Washington, DC: The World Bank.

World Bank (1997b) *World Development Indicators in CD-ROM*, Washington, DC: The World Bank.

World Bank (1998a) *World Development Report, Knowledge and Development*, Washington, DC: World Bank.

World Bank (1998b) *East Asia: the Road to Recovery*, Washington: World Bank.

World Bank (1999) *Knowledge and Development for the Information Age*, Global Knowledge Partnership, World Bank Economic Development Institute, archived discussions and papers, http://www.globalknowledge.org.

World Commission on Environment and Development (1987) *Our Common Future*, Oxford: Oxford University Press.

Xu, Zhenhui (1996) On the causality between export growth and GDP growth: An empirical re-investigation *Review of International Economics*, forthcoming.

Yaghmaian, Behzad (1994) An empirical investigation of exports, development, and growth in developing countries: Challenging the neoclassical theory of export-led growth. *World Development*, 22: 1977-1975.

Yanagihara, Toru (1994) Anything new in the *Miracle* report? Yes and no. *World Development*, 22: 663-670.

Young, A. (1928) Increasing returns to scale and economic progress. *Economic Journal*, 38: