The Effects Of Trade Policy On Intra-Industry Trade Within The Context Of Trade Liberalization In South Africa.

by

S.S.NAICKER

THESIS

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Supervisor: Prof.P.Brijlal

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DECLARATION

Except for the references specifically indicated in the text, and such help as I have acknowledged, this thesis is wholly my own work and not been submitted for degree purposes at any other university.

S.S. Naicker
12 October 2001
Durban

ABSTRACT

Intra-industry trade is a new phenomenon in international trade theory and has attracted interest from economists, in the form of both empirical and theoretical work. The first attempt to measure the extent of intra-industry trade in South Africa was under taken by Simson (1987). In his study Simson (1987) found that the amount of intra-industry trade accounted for only one-third of total trade. This is low compared to many industrialized countries. This thesis aims to analyze the extent of intra-industry trade within the context of trade liberalization.

Chapter two provides the evolution, background and an overview of the literature of the concept of intra-industry trade. This chapter is followed by a presentation of the different measurement of intra-industry trade. But, however the Grubel Lloyd (1975) index remains the most commonly used index in the literature. A fourth chapter estimated the level of intra-industry trade in South Africa for the period 1972 to 1993. This chapter concludes that intra-industry trade in South Africa is a real phenomenon and not just a statistical novelty as argued by Finger (1975). It was is concluded that intra-industry trade is low when compared to most of its trading partners and there remains much scope for the growth of intra-industry trade. The fifth chapter discusses the role of regional integration and intra-industry trade. It is concluded that the levels of intra-industry trade between South Africa and with the countries in the Southern African region is relatively low when compared to the intra-industry trade between South Africa and its major

trading partners, nevertheless there remains scope for the growth of intra-industry trade within the region as the countries become more similar. Chapter six discusses the commercial and welfare effects of intra-industry trade, concluding that there are advantages to be gained from intra-industry trade. Chapter seven analyses the effect of tariff levels on intra-industry trade in South Africa. Weak support was found for the height of tariffs and intra-industry trade in South Africa. Given the reduction of tariff lines in terms of the GATT requirement, it is anticipated that levels of intra-industry trade in South Africa will increase and there is much to gain in terms of welfare than inter-industry trade.

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LIST OF ABBREVATIONS

ADB-African Development Bank
BLNS- Botswana, Lesotho, Namibia and Swaziland
BLS- Botswana, Lesotho and Swaziland
BOP- Balance of Payments
CBI-Cross Boarder Initiative
CMA-Common Monetary Area
COMESA- Common Market for Eastern and Southern Africa
EC-European Community
ECSC-European Coal and Steel Community
EU-European Union
FTA-Free Trade Area
GATT-General Agreement on Tariffs and Trade
GEIS- General Export Incentive Scheme
GM index-Greenaway and Milner index
H.O-Heckscher-Ohlin
HS-Harmonized System
IC-Industrialized countries
IDC-Industrial Development Corporation
IDF-Import Declaration Fee
IIT-Intra-industry Trade
IMF-International Monetary Fund
LAFTA-Latin America Free Trade Area
NAFTA-North America Free Trade Area
LDC's-Less Developed Countries
MFN-Most favoured Nation
MMA-Multilateral Agreement
NIC's-Newly Industrialized Countries
OECD- Organization for Economic Corporation and Development
PTA- Preferential Trading Area
QRs-Quantitative Restrictions
ROW-Rest of The World
SA -South Africa
SACU-Southern African Customs Union
SADC- Southern African Development Community
SADCC-Southern African Development Coordination Conference
SIC-Standard Industrial Classification
SITC-Standard International Trade Classification
TMA-Trilateral Monetary Agreement
U.K-United Kingdom
UAPTA-Unit Accounts of the Preferential Trading Area
US-United States

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IN LOVING MEMORY OF MY BELOVED GRANNY
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CHAPTER ONE

INTRODUCTION

Intra-industry trade refers to the simultaneous export and import of goods from the same industry or product group. The phenomenon of intra-industry trade has attracted increasing interest from economists, in the form of both empirical and theoretical work in recent times. The theoretical interest is based on the notion that the traditional theory of comparative costs, dealing with homogenous products, is incapable of explaining a large and growing part of international trade, namely the simultaneous exports and imports to a country of goods of the same product group or industry. This phenomenon of intra-industry trade was observed following the empirical studies of the pattern of trade after the formation of the Benelux customs union (Verdoorn,1960), and the European Economic Community (Balassa, 1966; 1967). Its empirical significance, especially in manufacturing trade among industrialized countries, has been extensively documented by Grubel and Lloyd (1975). Included in their work are a number of plausible explanations for this phenomenon. Their pioneering analysis has contributed to an increasing attention on this concept in recent trade theory, Aquino (1979), Davies (1978), Finger (1975), Giersch (1975), Gray (1973), Lancaster (1980), Loertscher and Wolter (1980), and Pagoulatos and Sorensen (1975).

In terms of the new General Agreement on Tariffs and Trade (GATT), South Africa will be required to reduce the number of tariff lines from 12 000 lines to 6 000 by the end of the five year adjustment period. In addition to this, tariff lines, which have 80

different lines ranging from 0 per cent to 1 389 percent, will be standardized into six levels, with a maximum of 30 per cent (Cohen, 1995:3).

Belli, et al (1993) suggests such a reduction in the levels and complexity of import tariffs is an integral part of addressing the anti-export bias of the past trade policy. Tariff liberalization will also reduce the price-increasing effect of protection, acting to deflate the economy (IDC, 1990). It is argued that the immediate effect of tariff reform is to boost imports, while the stimulatory effects on exports is delayed and possibly weak. This will worsen the trade balance, tightening the balance of payments (BOP) constraint, estimated to restrict growth to 3 per cent per annum (Van der Walt and De Wet, 1993). The fiscal balance will also be restricted through a reduction in tariff (Bell, 1993). The direct competition which the 'cold winds' of liberalization will bring for import-competing industries, is expected to cause severe adjustment costs in the form of domestic recession and unemployment.

However, recent developments in new trade theory, together with the vast literature and empirical work on the significance and causes of intra-industry trade (IIT), may provide some optimism with regards to the potential welfare gains and adjustment costs set to accompany tariff liberalization. New trade theory offers a rethinking of international trade, with factors such as increasing returns, imperfect competition and product differentiation being formally modeled. The development and formulation of this new trade theory of intra-industry trade has provided a theoretical underpinning

to empirical work done over recent times, which as found intra-industry trade to be significant across a wide range of countries (Havrylshyn and Civan, 1993).

The 'stage of development' hypothesis suggests intra-industry trade will be greater in developed countries as opposed to developing countries. This is due to the increased specialization in manufacturing industries, as a result of the greater use of economies of scale to product differentiation, being a feature of higher income countries. Developing countries, on the other hand, with their low income levels of industrialization an income will continue to trade in complementary goods according to different factor intensities. As a country moves along an industrialization-led growth path, the pattern of production and trade specialization will increasingly resemble that of a developed nation, encompassing a range of differentiated products. According to Gunasekera (1989:84) 'intra-industry specialization in production and trade will play an increasingly important role in these countries as they develop further'.

The concept of intra-industry trade was first stumbled upon by Verdoorn (1960) when he noticed increased specialization within trade categories as a response to formation of the Benelux Union. The empirical literature on the relationship between tariff levels and the extent and levels of intra-industry trade is suggestive of a negative relationship, but by no means conclusive (Marvel and Ray, 1987; and Caves, 1981). Given the high levels of tariff protection in South Africa (IDC, 1990), especially when compared to developing countries standards, and the impending reduction in

tariff levels, this relationship is important. The IDC (1990), Bylae C: 2) notes a high degree of variation within the South African industries, with certain types of products enjoying high levels of protection and other industries very low. For example, the line immediately preceding a product with a tariff of 1320 per cent has a tariff of only 10 per cent. The one immediately after has a tariff of only 29 per cent (Belli, et al. 1993:12). This laser-beam approach to protection within the South African manufacturing sector will therefore conceivably retard intra-industry trade.

PLAN OF THIS THESIS

Chapter two provides the reader with the evolution, background and an overview of the literature on the concept of intra-industry trade. The numerous references in the literature on intra-industry trade indicate that most authors agree that the systematic research on the subject began with the volume by Grubel and Lloyd (1975). Grubel and Lloyd (1975) observed that the idea of intra-industry trade was not new but a mere continuation of a past concern with the pattern of commodity trade.

Chapter three provides the reader with an overall survey of the different types of measures of intra-industry trade known from literature. However, it is argued the most common index used to calculate intra-industry trade is the Grubel and Lloyd (1975) index. This chapter also focuses on the effects of trade imbalances on intra-industry trade and how the trade imbalances are corrected.

Chapter four contains an application of the most common measures on intra-industry trade to South Africa. A times series data for intra-industry trade in South Africa is provided in this chapter. Empirical evidence of other documented studies is also presented. Possible reasons for the high and low levels of intra-industry trade are reported in this chapter. This chapter compares the performance of the different types of intra-industry trade indices.

Chapter five looks at the concept of regional integration and intra-industry trade. A survey of the forms of trade integration in the Southern African region is provided. Neo-classical trade theory, with its predictions for trade for all trading countries that enter into free trade agreements under conditions of differences in factor endowment, perfect competition and constant returns to scale, has increasingly come to be questioned by economists who emphasize the existence of increasing returns to scale, external economies, and imperfect competition (Krugman, 1981, 1983 and 1987). By relaxing the assumption of perfect competition, the implications of trade integration in the presence of increasing returns focusing on inter-industry resource allocation effects can be considered. By relaxing the assumption of homogenous product, allowing for product differentiation, the possibility of intra-industry resource allocation can be considered. This chapter also draws on empirical studies from other regional unions elsewhere. The levels of intra-industry trade are provided with reference to South Africa and countries in the Southern African region.

Chapter six provides a theoretical analysis of intra-industry trade and trade liberalization focusing on commercial and welfare effects. In this chapter it is argued that the reduction in the tariff levels will increase the levels of intra-industry trade and thereby decreasing the costs of adjustment. Chapter seven focuses on the relationship between structural adjustment and trade policy on intra-industry trade. This chapter also draws on recent empirical work on the relationship between trade policy and intra-industry trade. Parr (1994) suggests ' the extent of intra-industry trade between South Africa and the rest of the world may give some indication as to the likely impact of trade liberalization on transitional adjustment costs and the pattern of new trade that might be expected to develop'. The role of tariff structure in determining the extent of intra-industry trade in South Africa is provided. Chapter eight concludes.

CHAPTER TWO

THE THEORY OF INTRA-INDUSTRY TRADE

2.1 INTRODUCTION

In recent years an increasing amount of academic attention has been directed at the phenomenon of intra-industry trade, in the form of both theoretical and empirical work. The theoretical interest is based on the notion that the traditional theory of comparative costs, dealing with homogenous goods, is incapable of explaining a large and growing part of international trade. Intra-industry trade refers to the simultaneous export and import of the belonging to the same industry or product group, which utilise similar factor requirements. The traditional Ricardian and Heckscher-Ohlin (H.O) models have a number of shortcomings when explaining trade between manufactured products and in industrialised countries, in particular the role economies of scale and product differentiation cannot be accommodated in the Ricardian and H.O. models. The aim of this chapter is to provide the reader with an overview of the history of intra-industry trade and models predicting the reasons and existence of intra-industry trade.

2.2 THE EVOLUTION OF INTRA-INDUSTRY TRADE

The empirical work of Grubel and Lloyd (1975), though not the the first application of the concept on intra-industry, is perphaps the most extensive work and became the discussion for trade theory.

2.2.1 EARLY STUDIES:

The first studies focused on the geographical distribution of trade patterns. In the 1930s the ***LEAGUE OF NATIONS*** observed that there was a tendency of work to ignore bilateral differences in trade patterns. Nations tried to maintain a balance between exports and imports with each other. In order to empirically verify trade patterns, manufacturing

trade was broken in three categories, namely bilateral trade, multilateral or triangular trade and total trade. The League of Nations in 1936 reported that of a sample of 22 countries (which represented 71 per cent of world trade from 1929 to 1935), bilateral trade increased from 71.7 per cent to 74.2 per cent, whereas the the multilateral trade decreased from 18.4 per cent to 13.8 per cent. Michealy (1962) took the investigation of multilateral and bilateral trade balancing further, but used an alternative approach to that of the League of Nations to explain trade flows. Grubel and Lloyd (1975) criticised this method, stating that it represented inter-industry trade rather than intra-industry trade.

The second branch of studies of trade concerned itself with the commodity of trade. Frankel (1943) reported that countries portraying high proportion of international *per capita* income, export and import more or less the same commodities. This was mainly because of quality differentiated products being explained by differences in human skills between countries. This is different from Linder's (1961) work, where demand of commodities is due to similiar tastes, and preferences.

In 1945 Hirschman measured trade patterns by matching of individual countries' exports and imports by broad classes of commodities.This is equal to intra-industry trade when two broad industries are taken into consideration, examples are foodstuffs and raw materials. In the 1950s and 1960s a number of empirical studies were undertaken to explain trade patterns, these include Baldwin (1958), Kojima (1962, 1964, 1968, 1971) and Maizels (1963). These authors concluded that the simultaneous export and import of commodities was responsible for the expansion of trade among the industrialised countries of Western Europe and North America. Kojima (1964 and 1968) based his findings of comparative advantage on the existence of economies of scale, technological change and product differentiation.

The third type of research on intra-industry trade was based on the effects of economic integration. This type of research was carried out by authors such as Verdoorn (1960), Balassa (1963, 1966, 1970 and Grubel and Lloyd in 1975). Surprisingly to these authors, there was an unexpected increase in intra-industry specialization than inter-industry specialization.The empirical establishment of intra-industry trade upon economic integration encouraged the search for more models explaining intra-industry specialisation in addition to the conventional trade theory of the Heckscher-Ohlin model of comparative advantage.

2.3 TOWARDS A THEORY OF INTRA-INDUSTRY TRADE

Conventional models or orthodox theories of trade are driven by inter-country differences in factor productivity or factor endowments. Factor productivity is discussed in the Ricardian type models and the factor endowment is driven by Heckscher-Ohlin (H.O.) type models. A major difference between the Ricardian type models and the H.O. models is that in the former the production function is assumed to be different in both countries, while in the latter the production is assumed to be the same. The conventional trade models analyze trade under conditions of perfect competition and constant returns to scale and do not account for technology as a factor endowment. Furthermore these models do not explain the concepts of imperfect competition, monopolistic competition, product differentiation, scale economies and technology, on which the debate of the new trade theories of intra-industry trade are based. The conventional trade models do not readily explain trade in manufactured goods but only in primary goods, conventional models focus primarily on supply-side economies, and these models do not readily explain trade in industrialised countries, but are limited to explain trade in less developed countries (LDC's). As Leamer (1981) notes, trade flows are driven by differences in factor endowments and factor productivity. Leamer (1981) writes in his work, that because of product differentiation and scale economies in developed countries, they will

participate more extensively in intra-industry trade with each other than developing countries, since each trading partner has more or less the same characteristcs in terms of factors of production, preferences and tastes. On the other hand Linder (1961) postulates that developing countries may be more of inter-industry trade (trade in goods in different industries with different factor requirements as characterised by conventional trade models) than of intra-industry trade (trade in similiar commodities within the same industry with relatively same factor endownments and similiar *per capita* incomes). The existence of intra-industry trade was believed to be inconsistent with the Heckscher-Ohlin model. Grubel and Lloyd (1975) modified the assumptions of the Heckscher-Ohlin in order to develop a model consistent with intra-industry trade.

The following Tables 2.1 and 2.2, presents the assumption of the Heckscher-Ohlin model in column 1, column 2 presents the Grubel and Lloyd (1975) modification of the assumptions in order to build their model. Columns 3, 4 and 5 lists the causes, types and examples of intra-industry trade.

TABLE 2.1

MODIFICATION OF THE ASSUMPTIONS OF THE HECKSCHER-OHLIN MODEL.

ASSUMPTIONS OF HECKSCHER-OHLIN MODEL	MODIFICATION OF ASSUMPTIONS	CAUSES OF INTRA-INDUSTRY TRADE	TYPE OF INTRA-INDUSTRY TRADE	EXAMPLES OF PRODUCTS
Products are homogeneous	Products are differentiated by location	High transport costs, small production – consumption areas.	1.Border trade	Heavy products and perishable products.
Products are homogeneous	Products are differentiated by time	Differences in costs and demand between countries	2. Periodic trade	Seasonal fruit. Electricity.
Products are homogenous	Products are differentiated by packaging.	Miscellaneous	3. Packaging differentiated trade	Acetyl-salicyclic acid.
Products are homogeneous	Products are differentiated by end use.	Different demand patterns	4. Joint-product trade	Tar/Gasoline/Oil
Products are homogeneous; Production functions are linear homogeneous	Products are differentiated by style: production functions are non-linear homogeneous	Demand factors; economies of scale	5. Style – differentiated trade.	Beverages, cigarettes, clothing
Products are homogeneous; Production functions are linear homogeneous	Products are differentiated by quality: production functions are non-linear homogeneous	Demand factors; economies of scale: *(availability of skills)	6. Quality differentiated trade	Aeroplanes, Tools, data-processing equipment

ASSUMPTIONS OF HECKSCHER-OHLIN MODEL	MODIFICATION OF ASSUMPTIONS	CAUSES OF INTRA-INDUSTRY TRADE	TYPE OF INTRA-INDUSTRY TRADE	EXAMPLES OF PRODUCTS
Products are homogeneous; Production functions are identical across countries; inputs of capital and labour are homogeneous between countries.	Products are differentiated by performance: production functions vary across countries	Demand factors: process innovation: legal protection	7.Technological gap trade	Electronic components
Products are homogeneous; Production functions are identical across countries.	Products are differentiated by performance or by styling: production functions vary across countries	Demand factors:process innovation: legal protection	8. Product cycle trade	Consumer electronics

*Availability of different levels of skills in different countries could be a possible reason for product differentiation.
Source: Grubel and Lloyd (1975)

TABLE 2.2

MODIFICATION OF ASSUMPTIONS CONSISTENT WITH THE HECKSCHER-OHLIN MODEL.

ASSUMPTIONS OF HECKSCHER-OHLIN MODEL	MODIFICATION OF ASSUMPTIONS	CAUSES OF INTRA-INDUSTRY TRADE	TYPE OF INTRA-INDUSTRY TRADE	EXAMPLES OF PRODUCTS
Zero-costs of storage and selling	Non-zero costs of storage and selling	Comparaive advantage of location and providing services	9.Entrê pot-trade	No examples
Zero costs of services	Non-zero costs of service	Comparative advantage in providing services	10. Re-exports	No examples
Zero-costs of government interference	Non-zero costs of government interference	Government interference	11. Bilateral agreements	No examples
Products are homogenous	Products are differentiated by inputs	Comparative cost differences	12. Input-differentiated trade	Furniture of steel, wood and plastic
Products are homogenous	Products are differentiated by stage of processing	Comparative cost differences; low costs of information and transport	13.International processing	Automobiles, electronics, clothing

Source : Grubel and Lloyd (1975).

The characteristics provided in Table 2.1 and 2.2, was that intra-industry trade is based on the relaxation of some of the main assumptions of the Heckscher-Ohlin model of international trade. The information from the tables focuses on characteristics of product characteristics and production processes. Differences in market structures were not taken

into consideration because the assumption of imperfect competition was not considered. The 1980's saw a remarkable transformation in the way economists analyze international trade theory. Since then a vast literature has emerged taking into account the role of market structures such as oligopolies, increasing returns, product differentiation and technology. These new trade models have been developed relaxing the concepts of the conventional trade models (H.O. and Ricardian models) of constant returns to scale and perfect competition.

2.4 MODELS OF INTRA-INDUSTRY TRADE

Conventional trade models have dominated trade theories ever since its formulation. These models however concentrate on assumptions of constant returns to scale and perfect competition and reflect trade in primary products which is mainly of inter-industry type. It is a given fact that market imperfections such as monopoly , economies of scale and product differentiation are influential in the real world. The Ricardian and H.O. models do not take these conditions into account nor show trade in manufactured goods, it is therefore necessary to build models incorporating these features.

Intra-industry trade was first stumbled upon by Verdoorn in 1960 while investigating fluctuations in intra-bloc trade of Benelux Union. Early work of Corden (1967) and Gray (1973) which attempted to correct the deficiency of the conventional models proved fruitless as the these models were model-specific and not flexible. It was the work of Dixit and Stiglitz (1977) and Lancaster (1980) that sparked the formulation of various economists taking a very keen interest in developing a theoretical framework concerning economies of scale and product differentiation in a general equilibrium context (relaxing the assumptions of the conventional trade models). Since then a vast literature has been

developed on the subject of new trade theories. A survey of these models is given in Greenaway and Milner (1986). The present section draws on that survey and lists a variety of theoretical models that were developed to account for the existence of intra-industry trade.

2.4.1 INTRA-INDUSTRY TRADE IN STRUCTURALLY COMPETITIVE MARKETS.

Structurally competitive markets is based on the assumption that there exists a large number of firms exhibiting characteristics of imperfect competition in the form of economies of scale on the supply side and a wide range of preferences on the demand side. Helpman (1981) defines this wide range of varieties and attributes available to the consumer as a 'continuum'.

2.4.2 NEO-HECKSCHER-OHLIN INTRA-INDUSTRY TRADE MODELS

The relationship between intra-industry trade and the Heckscher-Ohlin model are rendered inconsistent. Falvey's (1981) model of intra-industry trade is based on differences in relative factor endowments. In this model products are assumed to differ in quality, in the sense that a product of a higher quality will require more capital intensive production resulting in higher prices.The consumers' choice of the product of higher quality will be determined by their income constraints, resulting in the demand for a variety of different qualities. This will lead to countries specialising in production and trade of qualities in relation to their capital endowments (including human capital).

Examples of products are clothing and motor vehicles. This type of trade corresponds to quality-differentiated trade in Grubel and Lloyd (1975) and Linder (1961).

2.4.3 INCREASING RETURNS TO SCALE.

The assumption of constant returns to scale is universally adopted in general-equilibrium models. The condition of decreasing returns to scale provide very little problem to economists to analyze , but when it comes to increasing returns, economists are very cautious. The main problem when analysing the theoretical part of economies of scale is the problem of market structures. Untapped economies of scale are not compatable with standard competitive models, in recent years many economists have focused on trade theory incorporating increasing returns.These new thinking focuses on three types of market structures that include increasing returns to scale.The first approach is the Marshallian approach where increasing returns are assumed to be wholly external to the firm, permitting the concept of perfect competition to remain.The second approach is the Chamberlinian monopolistic competition to trade theory.The third approach is the Cournot approach which is recently being extensively used in international trade theory.These three approaches will be analyzed as this chapter progresses.

External and internal economies of scale have different implications for the structure of industries. External economies of scale occur when the cost per unit of output depends on the size of the industry and not the size of the firm, while internal economies of scale occur when the cost per unit of output depends on the size of an individual firm but not the size of the industry.Thoeretical framework maintains the competitive structure by assuming that increasing returns are external to the firm and internal to the industry. Internal economies of scale give large firms a cost advantage over small firms and lead to an imperfect market structure.

Increasing returns effects of the core suppositions of the Heckscher-Ohlin theorem was analyzed by Jones (1968), Mayer (1974) and Neary (1978). These authors focus on the slope of the transformation curve and conclude that returns to scale may have an effect on the results of the Rybcyznski (1955) and the Stolper-Sameulson (1941) theorems. Melvin (1969) zoomed in on trade between two identical countries in which both goods have increasing returns, and on the other-hand Markusen and Melvin (1981) considered only one good having increasing returns to scale, and identical preferences and taste. Economies of scale have a comparative advantage for large countries in the production of a good, which has increasing returns to scale. In these models scale economies depend on the level of output.

2.4.4. NEO-CHAMBERLINIAN MODELS OF MONOPOLISTIC COMPETITION

The first contribution in the analysis of monopolistic competition in the neo-chamberlinian sense arise from Dixit and Stiglitz (1977) analysis of international trade. This model is independent of relative factor endowments.The model focuses on mutually beneficial trade due to product differentiation by style and decreasing costs. It is assumed that all varieties will enter the consumer's utility function symmetrically and will have the same prices. Intra-industry trade will occur from the exchange of different varieties, resulting in specialization in limited varieties (Venables 1984). Lawrence and Spiller (1983) based their models on the assumption that differentiated products are more capital intensive than homogeneous products. This makes it possible for the capital-abundant country to specialize in the capital-intensive good and leaving the labour-abundant

country to specialize in the homogeneous good. Complete specialization in this sense will result in inter-industry trade.

2.4.5 NEO-HOTELLING MODELS OF MONOPOLISTIC COMPETITION

Lancaster (1980) used consumer behaviour developed in Lancaster (1966), where the demand for a particular product will be determined by income characteristics to develop a model of intra-industry trade. Lancaster (1980) proved that in a two country model, one having a differentiated product and one having a homogeneous product, the equality of factor endowments in the two countries will result in intra-industry trade as opposed to inter–industry trade. The smaller the difference in factor endowments between the two countries the larger the intra-industry trade. The higher the share of intra-industry trade, the higher the share of *per capita* income. This is based on the assumption that consumer demand at low-income levels is simple with regard to product characteristics. According to (Kjeldsen-Kragh: 1977, p. 246), the higher the growth of *per capita* income the larger is the share of intra-industry trade, because demand becomes more complex and differentiated. On the other hand the smaller the difference in *per capita* income between the countries, the higher the share of intra-industry trade is likely to be. The choice of a particular product among different varieties will be determined by the individual's income (Linder1961).

The neo-Hotelling models of monopolistic competition offer an alternative to the neo-Chamberlinian models. The main difference is due to consumer preferences and product diversity. The neo-Hotelling differs from the neo-Chamberlinian models in the sense that

the varieties of differentiated products enter the utility function in the neo-Chamberlinian models symmetrically but asymmetrically in the neo-Hotelling models. In the neo-Hotelling model the consumer is faced with a most preferred variety. This results in more varieties being produced when trade is opened, because tastes and preferences of individuals differ. In terms of factor endowments, Helpman (1981) found similar results as in the case of the neo-Chamberlinian case. Both the types of intra-industry trade in the neo-Chamberlinian case and the neo-Hotelling case is similar to product differentiation by style as described in Grubel and Lloyd (1975).

2.5 INTRA-INDUSTRY TRADE AND OLIGOPOLISTIC MARKETS

An oligopoly consists of a few large firms dominating the market, any change in one firm's price or output influences the sales and profits of other competitors. Oligopolists face a situation in which the optimal decision of one firm depends on what others decide to do, and in which there is the opportunity for both conflict and co-operation. There are many reasons for oligopolies to exist, one being economies of scale and the other barriers to entry and collusion.

2.5.1 THE COURNOT APPROACH

This analysis of trade model is based on the Cournot assumption that imperfectly competitive firms take each others' output as given. Much work using this approach was dealt with by Dixit (1987). Brander and Krugman (1983) indicate that trade between two countries with the production of an identical good by one producer in each of them will result in intra-industry trade taking place in either direction. Half the output produced for

the integrated economy will be produced in each others home market Neven and Phlips (1984) used the example of automobiles to explain this type of trade.This model of trade is similar to the one developed by Brander (1981) where the rivalry of oligolopolistic firms serves as an independent cause of international trade and leads to intra-industry trade in identical commodities. The nature of the oligopolistic rivalry between firms gives rise to 'reciprocal dumping'. Each firm dumps output into each others home markets.

2.5.2 NATURAL OLIGOPOLIES AND TRADE IN VERTICALLY DIFFERENTIATED PRODUCTS

Under the Cournot-model, the quality is the main strategic variable, but the analysis by Shaked and Sutton (1982, 1983, 1984) focuses on price as the strategic variable when studying market structures effecting trade. These products are vertically differentiated products by quality.Vertical differentiation refers to products at different stages of a production process. According to this model different qualities reflect different prices and the demand for different varieties will depend solely on the individual's income. Quality of products will depend on the level of research and development and technology. These costs are fixed costs and barriers to entry exists. Trade is profitable because it produces an extension of the market (the integrated market). Trade allows prices of products to decrease and the quality to improve. The country with higher *per capita* income will specialize in higher quality varieties. This type of trade represents trade similar to trade in differentiated products by quality as expressed by Grubel and Lloyd (1975).

2.5.3 OLIGOPOLY AND TRADE IN HORIZONTALLY DIFFERENTIATED PRODUCTS

Eaton and Kierzkowski (1984) focuses on trade which are differentiated by style. This model uses the analysis adopted by Lancaster (1980), where each consumer has a most preferred variety. A differentiated good sector as well as a homogeneous good sector is also said to exist . Due to the limited demand for varieties there are a limited number of producers. In this model there could be two types of trade:

(1) inter-industry trade (one country specializing in the homogeneous good and the other country specializing in the differentiated good) and

(2) intra-industry trade in differentiated products due to the similarities in tastes of the two countries , the smaller the country size and the more alike the most preferred varieties.

This type of trade represents trade similar to trade in differentiated products by style as expressed by Grubel and Lloyd (1975).

2.6 INTRA-INDUSTRY TRADE, MULTINATIONAL FIRMS AND MULTI-PRODUCT FIRMS

This section relaxes the assumption of single product firms located in one country and analyzes the relationship between intra-industry trade and forms producing more than one variety of a good and /or having their production facilities or distribution in more than one country.

2.6.1 MULTI-PRODUCT FIRMS AND INTRA-INDUSTRY TRADE

If costs of production are fixed with the introduction of a new variety, the production of a number of varieties by a single firm could discourage entry into the market. The smaller the number of firms engaged in the production of a given set of varieties, the more feasible the co-ordination of the price decision-making process. Multi-product economies of scale (where fixed costs are spread over a range of varieties), and scale economies (where a given production facility is able to produce a number of varieties), also provide incentives for firms for multi-variety production.

Greenaway and Milner (1986), show that with multi-product firms, intra-industry trade can arise likewise as discussed under the heading neo-Hotelling models of monopolistic competition, when products are differentiated by style. However Lancaster (1984) shows that when a firm enjoys a monopoly on the domestic market, it could discourage foreign competition by lowering prices and increasing the number of varieties, thereby precluding intra-industry trade. On the other hand, the potential for price discrimination across countries for commodities differentiated by style provides an additional source for intra-industry trade. Economies of scale will provide a disincentive to entry for domestic producers but for a foreign producer, where set–up costs of multi-variety production have been made already, it might not, and intra-industry trade could beneficially take place. A multi-product firm can specialize in varieties of style and/or quality.

2.6.2 INTRA-INDUSTRY TRADE AND MULTINATIONAL CORPORATIONS

Foreign direct investments may be a substitute for trade. With significant economies of scale in producing certain varieties and demand for some or all varieties present in one or more countries, foreign direct investment may lead to production of varieties spread across countries and intra-industry trade among them. If products or commodities are differentiated by style, the choice of location is not likely to depend on differences in prices of factors of production. However, with product differentiation according to quality, the choice of location depends on differences in factor prices because production of higher qualities is assumed to be more capital-intensive.

Factor price differences play an important role in foreign processing. Foreign direct investment or more generally the fragmentation of production processes across countries, may lead to intra-industry trade in parts, components and final products. Multinational firms and more generally the spread of production across countries may provide an alternative source on intra-industry trade in products differentiated by style, quality and the stage of the production process. Table 2.3 represents a summary of the models of intra-industry trade under different market structures.

TABLE 2.3

TYPES OF INTRA-INDUSTRY TRADE ACCORDING TO DIFFERENT MARKET STRUCTURES.

(a). STRUCTURALLY COMPETITIVE MARKETS

MODEL	CHARACTERISTICS	TYPES OF INTRA-INDUSTRY TRADE	REFERENCES
(a) Neo-Heckscher-Ohlin models	Quality-differentiated products; consumers' choice income constrained	Quality differentiated trade	Falvey (1981), and Kierzkowski (1984)
(b) Neo-Chamberlinian models	Style-differentiated products entering the utility function symmetrically	Style-differentiated trade	Dixit and Stiglitz (1979), Krugman (1979, 1980, 1982) and Venables (1984)
(c) Neo-Hotelling models	Style-differentiated products entering the utility function asymmetrically	Style-differentiated trade	Lancaster (1980), Helpman (1981)

(b). OLIGOPOLISTIC COMPETITIVE MARKETS

MODEL	CHARACTERISTICS	TYPES OF INTRA-INDUSTRY TRADE	REFERENCES
(d) Cournot-behaviour	Output as strategic variable	Intra-industry trade in identical commodities	Brander (1981), Brander and Krugman (1983)
(e) Natural oligopolies	Price as strategic variable	Quality-differentiated trade	Shaked and Sutton (1982, 1983, 1984)
(f) Oligopoly	Varieties and price as strategic variables	Style-differentiated trade	Eaton and Kiertzkowski (1984)

(c). MULTI-PRODUCT FIRMS, MULTINATIONAL FIRMS

MODEL	CHARACTERISTICS	TYPES OF INTRA-INDUSTRY TRADE	REFERENCES
(g) Multi-product firms	Varieties and price as strategic variables	Quality and style-differentiated trade	Greenaway and Milner (1986)
(h) Multi-national firms	Direct foreign investment; intra-firm trade; international processing	Trade in commodities differentiated by quality, style and stage of processing	Norman and Dunning (1984), Mainardi (1986), Grubel and Lloyd (1975)

Source: Greenaway and Milner (1986)

2.7 CONCLUSION

A large number of types of intra-industry trade exist, distinguished by types of product differentiation, differences in production processes and different forms of market behaviour. Grubel and Lloyd (1975) have modified the assumptions of the Heckscher-Ohlin model in order to derive models consistent with intra-industry trade. Table 2.1 gives a summary of the modifications of the assumptions that give rise to predictions of intra-industry trade. One of the shortcomings of the Grubel and Lloyd (1975) model is the absence of the modification of perfect competition, assumed in the Heckscher-Ohlin model of international trade. Recent models of intra-industry place emphasis on different markets. The contributions on different market structures have been surveyed by Greenaway and Milner (1986).

In the market structure approach, intra-industry trade is viewed as the outcome of international firm's market conduct. It is the result of market interpenetration and segmentation by oligopolistic firms seeking market shares on a worldwide scale through exports and counter exports. Market conduct is constrained and determined by market structure. Variations in intra-industry intensities across industries can be explained by different structural characteristics of industries. Important elements of market structures include: the degree and character of product differentiation, the nature of consumer choice and ignorance, the nature and extent of scale economies, technology characteristics of the industry, the number and size distribution of firms in the industry, and conditions of entry.

Multi-product firms can discourage intra-industry trade, but economies of scale and price discrimination among countries may lead firms to engage in intra-industry trade. Multi-product firms may invest directly to substitute for trade, but may on the other hand allow production of style and quality differentiated products in different countries, to be exchanged by intra-industry trade. The theory of intra-industry trade has important implications for policy and welfare.

CHAPTER THREE

THE MEASUREMENT OF INTRA-INDUSTRY TRADE

3.1 INTRODUCTION

The aim of this chapter is to provide the reader with an overview or survey of the different approaches when measuring the amount or degree of intra-industry trade. The chapter begins by focusing on the early measures of intra-industry trade. The different measures yield different results but it cannot be concluded that one measure is preferred over the other. Section 3.2 focuses on the different measures of intra-industry trade; section 3.5 presents the effects of trade balance in the measurement of intra-industry trade. In this section various methods are surveyed; section 3.6 deals with the role of categorical aggregation in explaining the levels and trends of intra-industry trade and section 3.7 concludes.

3.2 DIFFERENT MEASURES OF INTRA-INDUSTRY TRADE

3.2.1 THE VERDOORN INDEX

In his study of the Benelux Union, Verdoorn (1960) measured patterns of trade by computing inter-industry trade and intra-industry specialization, for all industries at the three-digit level, by using the ratio U_i:

$$U_i = X_i / M_i \qquad (1)$$

X_i and M_i in his study were Dutch exports to, and imports from, Belgium-Luxembourg. According to Verdoorn the ratio varies between zero and infinity; the value 1 indicates equality of exports and imports and would represent complete intra-industry specialization has taken place. But if the ratio diverged from 1 over time inter-industry specialization has occurred. According to Grubel

and Lloyd (1975) the major disadvantage with this ratio U_i is that any fraction $1/m$ and its inverse m measure the same degree of inequality of intra-industry specialization. This retards comparison between industries.

Kojima (1964) and Grubel (1967) calculated the extent of inter-and intra-industry specialization by computing ratios for exports and imports. Grubel (1967) made all ratios greater than unity by taking the larger of the export and import values to the smaller. This measure shows that there would be greater intra-industry specialization if the ratio moves towards one and lesser intra-industry specialization if the ratio moved away from one. Kojima (1964) used the reciprocal ratio of the smaller value of exports and imports to the larger value. He claimed that the results would lie between zero and unity. Grubel and Lloyd (1975) argued that both the Kojima-index and the Grubel-index overcame one undesirable feature of the Verdoorn-index, but all three indices shared another drawback; that by using quotients or ratios of trade flows, they do not provide a direct measure of intra-industry trade as proportion of total trade. This shortcoming is met by the index introduced in Balassa (1966) and used subsequently among others in Balassa (1974).

Hirschman (1945) measured inter-industry and intra-industry specialization by dividing world exports and imports into two categories of goods, manufactures and raw materials. He then divided exports and imports into three components:

(a) The aggregate trade balance, i.e. the excess of exports over imports and vice versa.

(b) The values of matching exports and imports of manufactures and raw material-foodstuff.

(c) The value of trade of manufactures, which is matched by trade of raw materials.

Hirschman expressed these components as a percentage of total exports plus imports.

3.2.2 THE BALASSA INDEX

In order to measure the proportion of intra-industry trade the level of an industry i Balassa (1966) used the following index:

$$D_i = \frac{(X_i - M_i)}{(X_i + M_i)} \qquad (2)$$

With X_i and M_i representing exports and imports in the same industry, the D_i index measures the proportion of trade that is *not* of intra-industry type, because the numerator contains the amount as far as it does *not* overlap. The Balassa-index has the advantage over the Verdoorn measure in that it calculates the proportion of trade to be considered of the intra-industry type. A value of zero indicates complete trade-overlap and consequently all trade is to be considered of the intra-industry type. In order to obtain an aggregate index, $\overline{D}_i$ representing a country's intra-industry trade in all industries, Balassa (1966) defined his measure of intra-industry trade (an unweighted average of the ratio D_i) as:

$$\overline{D}_i = \left(1/n\right)\sum_{i}^{n}\left[\frac{|X_i - M_i|}{X_i - M_i}\right] \qquad (3)$$

The industry ratio, and their average $\overline{D}_i$, really measures inter-industry trade. Balassa interpreted it as a measure of intra-industry trade increasing as the

measure decreases. $\overline{D}_i$ also lies between zero and unity. According to Grubel and Lloyd (1975) the Balassa-index has two drawbacks. Firstly, it gives equal weights to all industries, irrespective of whether their share in total industry exports plus imports is large or small. Secondly, there is no correction for aggregate trade imbalance.

3.2.3 THE MICHEALY INDEX

Michealy (1962) proposed a measure, which focuses on the overall similarity and dissimilarity of commodity composition of exports *(X)* and imports *(M)*. The purpose of this type of measurement was to investigate the relationship between commodity trade and changes in commodity patterns. The Michealy index is defined as follows:

$$\bar{E}_i = \sum_i^n \left| \frac{X_i}{\sum_i^n X_i} - \frac{M_i}{\sum_i^n M_i} \right| \qquad (4)$$

This measurement lies between 0 and 2. 0 representing complete similarity and the value 2 representing complete dissimilarity. In order for the values to range between 0 and unity, Grubel and Lloyd (1975) divided the index by 2. The measurement lies between 0 and unity. The index is expressed as follows:

$$\bar{F} = 1 - \frac{1}{2} \sum_i^n \left| \frac{X_i}{\sum_i^n X_i} - \frac{M_i}{\sum_i^n X_i} \right| \qquad (5)$$

This index represents intra -commodity trade (adjusted by the factor 2). Higher values represent a greater degree of similarity and vice versa.

3.2.4 THE GRUBEL- LLOYD INDEX (GL) INDEX

According to the Grubel and Lloyd (1975) intra-industry trade(R_i) is the value of exports of an 'industry' which is exactly equal to the imports of the same industry.

$$R_i = (X_i + M_i) - |X_i - M_i| \qquad (6)$$

Where X_i equals the value of exports and M_i equals the value of imports of any industry $i, i = 1,...n$, where n is the number of industries chosen at any level of aggregation. R_i can be computed for the home country's trade with one or a sub-group, or all foreign countries trade. Inter-industry trade can be defined as follows:

$$S_i = |X_i - M_j| \qquad (7)$$

It follows from this that intra-industry trade is concerned with the total value of trade $(X_i + M_i)$ less net exports or imports of the industry. In order to draw comparisons and conclusions for different industries and different countries it is necessary to express the ratios as a percentage of each industry's aggregate value of exports and imports. The measures for inter-industry trade and intra-industry trade are as follows:

$$A_i = [|X_i - M_i| / (X_i + M_i)] * 100 \qquad (8)$$

and

$$B_i = [(X_i + M_i) - |X_i - M_i|] / (X_i + M_i) * 100 \qquad (9)$$

Both these indices lie between 0 and unity. A_i and B_i represents the levels of inter-and intra-industry trade respectively. The B_i measurement calculates the actual level of intra-industry trade and it is used in most econometric studies.

This B_i index is opposite to one used by Balassa (1966), equation (2). Using this measure one can compute intra-industry trade for all industries at any given level of aggregation or at different levels of aggregation. According to the authors, in order to draw a summary measure of a set of individual measures one can calculate the mean. By using the relative size of the sum of exports and imports in the individual industry as weights in the aggregate value of exports plus imports of the set of n industries, the mean can be computed as follows:

$$\overline{B}_i = \sum_i^n B_i (X_i + M_i) / \sum_i^n (X_i + M_i) \bullet 100$$

$$= \frac{\sum_i^n (X_i + M_i) - \sum_i^n |X_i - M_i|}{\sum_i^n (X_i + M_i)} \bullet 100 \qquad (10)$$

The $\overline{B}_i$ measures the average intra-industry trade as the percentage of the sum of exports and imports. It is also equal to the sum of the intra-industry trade for the industries as a percentage of the total trade for the industries as a percentage of the total export plus import of the n industries:

$$\overline{B}_i = \frac{\sum_i^n [(X_i + M_i) - |X_i - M_i|]}{\sum_i^n (X_i + M_i)} \bullet 100 \qquad (11)$$

3.3 THE GRUBEL-LLOYD INDEX AND THE LEVEL OF AGGREGATION

It is assumed that for the ith industry, at a particular level of aggregation, X_i and M_i are each made up of exports and imports defined at a more disaggregated level, X_{ij} and M_{ij}. The percentage of intra-industry trade for the ith industry is

calculated by using the sums $\sum_j X_{ij}$ and $\sum_j M_{ij}$. B_i in equation (9) can be rewritten as:

$$B_i = \frac{\sum_j (X_{ij} + M_{ij}) - |\sum_j X_{ij} - \sum_j X_{ij}|}{\sum_j (X_{ij} + M_{ij})} \bullet 100 \qquad (12)$$

It is important to note the following result of this aggregation.

Since:

$$R_i = \sum_j (X_{ij} + M_{ij}) - (\sum_j X_{ij} - \sum_j M_{ij}) \geq \sum_j (X_{ij} + M_{ij}) - (\sum_j |X_{ij} - M_{ij}|)$$

and since the denominator of B_i is unaffected by aggregation the measure of intra-industry trade at a more aggregative level is greater than, or at least no less than, the measured intra-industry trade with a finer product breakdown. Aggregation increases the measure of intra-industry trade by an amount in proportion to the extent to which the terms $(X_{ij} - M_{ij})$ at the less aggregated level are of opposite signs. It is also possible that an aggregated measure is 100 when at the disaggregated level the j measures are zero.

3.4. TRADE IMBALANCE EFFECTS IN THE MEASUREMENT ON INTRA-INDUSTRY TRADE

One of the major problems facing the measurement of intra-industry trade at the industry level is whether and how to appropriately adjust the industry indices for the effects of the overall trade imbalance. The overall trade imbalance may influence the level of intra-industry trade, which may indicate an upward or downward bias in the measurement.

3.4.1 THE GRUBEL-LLOYD ADJUSTMENT

Grubel and Lloyd (1975) indicate that $\overline{B}_i$ is a downward biased measure of intra-industry trade if the country's total commodity trade is imbalanced or if $\overline{B}_i$ is an average of some subset of industries for which total export are not equal to total imports. According to the authors, with an imbalance between exports and imports the mean must be less than 100 no matter what the pattern of exports and imports, because export cannot match imports in every industry. This is an unrealistic feature of a measure of intra-industry trade, which is due to the fact that it increases both the trade balance effect and the extent of intra-industry trade. Grubel and Lloyd (1975) suggest that when considering all commodity trade one needs to adjust for aggregate trade imbalance by expressing intra-industry trade as a proportion of total commodity export plus import trade less the trade imbalance. This gives the adjusted measure:

$$\overline{C} = \frac{\sum_{i}^{n}(X_i + M_i) - \sum_{i}^{n}|X_i - M_i|}{\sum_{i}^{n}(X_i + M_i) - \left|\sum_{i}^{n} X_i - \sum_{i}^{n} M\right|} \qquad (13)$$

Where n is the aggregate number of industries at any given level of aggregation. It follows from this that:

$$\overline{C} = B_i \cdot \frac{\sum_{i}^{n}(X_i + M_i)}{\sum_{i}^{n}(X_i + M_i) - \left|\sum_{i}^{n} X_i - \sum_{i}^{n} M_i\right|}$$

$$= B_i \cdot 1/(1/1-k)$$

Where $k = \dfrac{\left|\sum_{i}^{n} X_i - \sum_{i}^{n} M_i\right|}{\sum_{i=1}^{n}(X_i + M_i)}$ $\quad (0 \le \overline{B}(adj) \le 1)$ $\qquad (14)$

This index increases as the aggregate imbalance increases as a proportion of sum of total exports and imports. When comparing intra-industry trade with different countries the adjustment makes a large difference if the bilateral trade differences are substantial relative to the total effect of exports and imports. This adjustment increases the average measure of intra-industry trade by the same proportion at all levels of aggregation. The adjusted index will lie in the range between 0 and 100. This adjusted index can be used to compute intra-industry trade on a multilateral or bilateral basis. Greenaway and Milner (1986) argue that the Grubel-Lloyd (1975) adjustment index provides a measure of the average level of intra-industry trade if the overall trade of commodities were balanced (i.e. in equilibrium). The authors further argue that if there is no reason for the overall trade balance to be in equilibrium, Grubel and Lloyd (1975) only adjust solely because of the 'functional constraint' on the value of $\overline{B}_i$ (Greenaway and Milner: 1986,p.68). Greenaway and Milner (1986) suggest that for the principal of adjustment two important criteria need to to satisfied:

(a) What range of exports and imports would have to balance to bring about equilibrium.

(b) How would exports and imports at a particular level of aggregation change if the process of equilibrium were reached.

Whenever an adjustment is considered it is assumed it will correct the condition of disequilibrium and bring about overall trade balance. But, however equilibrating forces may not necessarily give the researcher an accurate prediction of the level of intra-industry trade. In some cases equilibrating forces may increase rather than

decrease a particular set of transactions. Greenaway and Milner (1986) therefore suggest that the mean ($\overline{B}_i$) is not necessarily a biased downward measure of the level of intra-industry trade with regard to the presence of the total trade imbalance as suggested by Grubel and Lloyd (1975). There are special characteristics of the economy that may influence the condition of equilibrium. If the condition of disequilibrium occurs the Grubel-Lloyd adjustment index may not be an ideal measure to correct the overall trade imbalance. In the situation where the total trade balance increases to bring about equilibrium; Greenaway and Milner (1986) suggest that $\left(\overline{B}_i\right)$ will overstate the average intra-industry trade.

3.4.2 THE AQUINO ADJUSTMENT

According to Aqunio (1978), Grubel and Lloyd (1975) did not think it was necessary to correct the elementary index B_i, this is because the authors believed that the bias of the summary measure $\overline{B}_i$ arises in the process of obtaining it as a mean of the values of $\overline{B}_i$ (implicitly considered unbiased). According to Aquino (1978) this is incorrect, if a country's total trade is imbalanced, $\overline{B}_i$ is a downward bias summary measure of intra-industry trade because B_i is a downward biased measure of intra-industry trade in each commodity. According to Aquino, this is because 'one cannot possibly maintain that the overall imbalance has not an imbalancing effect on the single commodities trade flows and then recognize that the imbalancing effect appears at a highest level of industry aggregation' Aquino (1978: 280). One cannot expect the imbalancing effect to be equiproportional in a single industry, but on average the imbalancing effect on each industry's trade must be equal to the overall imbalance. In most cases the imbalancing effect is

equal to the overall trade imbalance. If there is no information about inter-commodity differences, Aquino (1978) assumes that the imbalancing effect is equiproportional to the overall trade balance. Aquino (1978) suggests before calculating the values for B_i, one needs to estimate what the value of imports would have been if the aggregate exports equals aggregate imports. The choice of the appropriate imbalance and the balancing effect is crucial.

The Aquino (1978) index is as follows:

$$\text{Where 'expected' exports } \left(\hat{X}\right) = X_i \bullet \left[\frac{\frac{1}{2}\sum_{i=1}^{n}\left(X_i + M_i\right)}{\sum_{i=1}^{n} X_i}\right] \qquad (15)$$

$$\text{And where 'expected' imports } \left(\hat{M}_i\right) = M_i \bullet \left[\frac{\frac{1}{2}\sum_{i=1}^{n}\left(X_i + M_i\right)}{\sum_{i=1}^{n} M_i}\right] \qquad (16)$$

$$\text{It can be easily verified that: } \sum_{i=1}^{n}\hat{X} = \sum_{i=1}^{n}\hat{M}_i = \tfrac{1}{2}\sum_{i=1}^{n}\left(X_i + M_i\right) \qquad (17)$$

Applying the Grubel and Lloyd (1975) B_i to the values of $\hat{X}$ and $\hat{M}$ one can obtain a measure of the proportion of intra-industry trade in a country's trade of commodity i, purged of the imbalancing effect of the overall imbalance in a country's trade. The Aquino (1978) index is as follows:

$$Q_i = \frac{\left(\hat{X} + \hat{M}\right) - \left|\hat{X} - \hat{M}\right|}{\left(\hat{X} + \hat{M}\right)} \bullet 100 \qquad (18)$$

According to Aquino (1978) in order to get a weighted average of the values Q_i relative to various commodities, with weights given by each commodity's share in

a country's total trade which gives a correct summary measure of the proportion of intra-industry trade in a country's aggregate trade, the following formula should be used:

$$Q_j = \frac{\sum_i (X_i + M_i) - \sum_j \left| \hat{X}_i - \hat{M}_i \right|}{\sum_i (X_i + M_i)} \bullet 100 \qquad (19)$$

$$\text{Since } \sum_i \left(\hat{X}_i + \hat{M}_i \right) = \sum_i (X_i + M_i)$$

Aquino suggests that the formula has an advantage over the $\overline{B}_i$ and $\overline{C}_i$ formula used by Grubel and Lloyd (1975), since $\overline{B}_i$ and $\overline{C}_i$ both depend upon the sum of the absolute values of exports and imports. The Aquino (1978) adjustment differs from the Grubel and Lloyd (1975) adjustment, in the sense that for any group of commodities for which exports are greater or equal to imports or vice versa it's value is equal to the absolute value of the sum of exports less imports irrespective whatever the values of exports and imports are. Empirical evidence undertaken by Aquino in 1978 confirmed that $\overline{B}_i$ was a downward biased measure of intra-industry trade and $\overline{C}_i$ was an upward biased measure of intra-industry trade. Loertscher and Wolter (1980) used the Aquino index to adjust for the bias on bilateral trade imbalances in manufactured industries.

3.4.3 THE BERGSTRAND ADJUSTMENT

Bergstrand (1983) suggests that bilateral trade at the industry level should be adjusted for multilateral, not bilateral trade imbalances. Bergstrand like Aquino assumes that the imbalancing effect is equiproportional in all industries. Bergstrand assumes that adjusting disaggregate bilateral trade flows for bilateral

trade imbalances cannot solely be attributed to theory, it should be based on some norm consistent with the theoretical framework. According to Bergstrand (1983), if the researcher chooses trade balance as the criteria for adjustment, this could be purely arbitrary. Bergstrand (1983) first considers the relevance of trade theory in relating the condition of equilibrium with multilateral trade balance. This removes the criticism of arbitrariness, but in practice trade balance does not necessarily equate itself to the condition of equilibrium. The equiproportional adjustment assumption in imports and exports in order to restore total equilibrium $\left(\sum_{j=1}^{n} \hat{X} = \sum_{j=1}^{n} \hat{M}\right)$ is arbitrary and is likely not to give a true reflection of intra-industry trade even if the correct balancing effect is used.

3.5. THE ROLE OF CATEGORICAL AGGREGATION

Categorical aggregation occurs when commodities are inappropriately grouped together. According to the authors, Greenaway and Milner (1983) when measuring intra-industry trade the main criteria is to group together products which constitute an 'industry'. Homogeneity can be defined in one of many ways, depending on the view of the research. For example Balassa (1977) defines homogeneity with reference to high substitution 'elasticities' in production. Aquino (1978) on the other hand defines 'homogeneity' as the 'similarity' of the 'technological intensity' of any production process. According to Greenaway and Milner (1983), to remove the problem of categorical aggregation at a particular level of aggregation, one needs to calculate intra-industry trade using the following formula:

$$C_j = \frac{\sum_{i=1}^{m} |X_{ij} - M_{ij}|}{\sum (X_{ij} + M_{ij})} \qquad (20)$$

Where j = the jth of n industries at any given level of statistical aggregation, and i = the ith component of the m sub-group categories in j at the $j = 1$ level of aggregation, and

$$0 \leq C_j \leq B_j \leq 1.$$

According to the Greenaway and Milner (1983) index, rather than taking the absolute difference between exports and imports for given level of aggregation (say at the third digit level, if this level of aggregation is chosen at the initial level) for the numerator as is for the case B_i, one needs to aggregate trade imbalances of each of the fourth digit categories in the particular third digit grouping to get the numerator. If all the fourth digit imbalances have the same sign, then $B_j = C_j$. If the signs differ $C_j < B_j$. C_j is the weighted average of the individual fourth digit B_{ij} index. In cases where $C_j = 0$ each $B_{ij} = 0$, in cases where there are opposite signs $B_j = 1$. The Greenaway and Milner adjustment is based on the assumption that categorical is linked with the opposite signs on the trade balances at the immediate next level of aggregation. According to Greenaway and Milner (1983: 903) ' if there are a number of fourth-digit activities with different factor input ratios and limited scope for substitutability, this may be reflected in offsetting trade imbalances. If intra-industry trade is measured at the third-digit level, the trade imbalances are aggregated and the third digit B_i correspondingly inflated. When C_j rather than B_i is used , the opposite signed imbalances do not offset each other and the resultant measure is free from distortion'. The authors

recommend its use in preference to B_i because it is an average of the trade-weighted sub-group indices. However the most widely adopted procedure is to measure intra-industry trade at a lower level of aggregation. These two methods (C_j index as well as measuring intra-industry trade at a lower level of aggregation) will be adopted in chapter four to assess the problem of aggregation.

3.6 CONCLUSION

Various measures have been used to calculate the degree of intra-industry trade. Different measures fit different tasks, depending on the area and extent of the research, alternative measures will turn out to be most appropriate. This will enable the researcher to get a clearer picture of the existence of intra- industry trade. But, however the most commonly used index is the Grubel and Lloyd (1975) index. With regard to the trade balance effects, different authors have different views. The most appropriate method to adjust for categorical aggregation is to compute intra-industry trade at a lower level of aggregation. Greenaway and Milner (1983) also propose an alternative index adjustment of intra-industry trade. Measures vary in their performance, sometimes considerably; on the other hand it cannot be concluded that one of these measures is preferred above all the others regardless of the topic under study. Different measures fit different tasks; depending on the area of research, alternative measures will turn out to the most appropriate to employ. Surveys of intra-industry trade have been presented in Tharakan (1983), Greenaway and Milner (1986) and Kol and Mennes (1986). Methods discussed in this section will be employed in chapter four to calculate the levels and extent of intra-industry trade for South Africa.

CHAPTER FOUR

4.1 INTRODUCTION

This chapter employs the measures discussed in chapter three to assess the level of intra-industry trade for South Africa. This chapter also seeks to explain the variability of the measures of intra-industry trade across industries. The chapter is structured as follows; section 4.2 provides the reader with some empirical evidence of studies conducted with levels of intra-industry trade of other countries, section 4.3 discusses a brief preview of the period under investigation and reports the levels of intra-industry trade for South Africa with the rest of the world at the three-digit and four-digit level SIC classification system, section 4.4 focuses on the aggregation problem as discussed in the previous chapter, this section also examines whether the concept of intra-industry trade is merely a statistical phenomenon argued as by Finger (1975) and Vona (1990), section 4.5, discusses the trends in intra-industry trade between South Africa and its major trading partners, countries in the Southern African region as well as countries in the PTA, section 4.6 looks at the empirical performance of the different types of indices, section 4.7 analyzes the impact of categorical aggregation on South Africa's intra industry trade and section 4.8 concludes.

4.2 EMPIRICAL EVIDENCE ON THE MEASUREMENT OF INTRA-INDUSTRY TRADE

The significance of intra-industry trade as a proportion of total trade has been confirmed in a number of empirical studies. Grubel and Lloyd (1975: 35) reported that intra-industry trade accounted for 63 per cent on average of all trade among OECD countries in 1967. Culem and Lundberg (1986) showed that the share of intra-industry trade in total OECD

trade in manufactures varied from 35 per cent to 80 per cent in 1980. The proportion of intra-industry trade to total trade has also been computed for developing countries, Balassa (1979) computed intra-industry trade for nine countries of the Latin America Free Trade Association (LAFTA) and Central American Common Market (CACM). The average value recorded was 23 per cent. In 1978, Havrylyshyn and Civan (1985) reported that the average intra-industry trade in manufactured goods was 23 per cent. Intra-industry trade for the 13 Newly Industrialized Countries (NICs) in the sample was 42 per cent, while the average intra-industry trade for the 31 non-NICs was only 15 per cent. The values found by Havrylyshyn and Civan (1985) is reported in Table 4.2. Simson (1987) found that the average intra-industry trade for South Africa was 35 per cent in 1981. In comparison with intra-industry trade of developed countries, 35 per cent is low but quite high in relation to that of developing countries and on a par with intra-industry trade in the NICs, as measured by Havrylyshyn and Civan (1985). This is relatively low when compared to rest of the world. These international comparisons is given in Table 4.1. The low levels of intra-industry trade for South Africa confirmed Simson (1978: 85) hypothesis that intra-industry trade will be low because:

(a) South Africa's dissimilarity compared to its major trading partners.

(b) Relatively low *per capita* income not warranting the production of many varieties or allowing for economies of scale, and

(c) High transport costs offsetting the possibility of economies of scale and access to large overseas market.

Parr (1994) using the 2-digit HS data, reported that the average intra-industry for South Africa was 32 per cent (unadjusted Grubel –Lloyd ($\overline{B}_i$)) or 37 per cent if the adjustment

for trade imbalance is made. In contrast, the value of the Grubel-Lloyd unadjusted measure for the four-digit HS data for 1992 was only 19 per cent, or 22 per cent adjusted for the trade surplus. Possible explanation for the low levels of intra-industry trade indices could be attributed to the considerable variation in factor intensity within the four-digit HS classification; in turn this could be a sign of improper data aggregation in the HS classification. The low levels could also be because of the large dispersion and generally high rates of tariff protection in South Africa.

TABLE 4.1

INTERNATIONAL COMPARISON OF INTRA-INDUSTRY TRADE

1.UNITED KINGDOM	69
2. FRANCE	65
3. BELGIUM/LUXEMBOURG	63
4. NETHERLANDS	56
5. UNITED STATES	49
6. CANADA	48
7.GERMANY	46
8.ITALY	42
*9. SOUTH AFRICA	35
10.JAPAN	21
11. AUSTRALIA	17

SOURCE: GRUBEL AND LLOYD (1975)
* SIMSON (1987).

TABLE 4.2
INTRA-INDUSTRY TRADE INDICES BY COUNTRY, 1978, %

NON-NIC DEVELOPING COUNTRIES		NICs				ICs	
Algeria	1.5	Kenya	13.9	Argentina	42.3	Australia	25.3
Cameroon	6.1	Malawi	6.6	Brazil	37.8	Austria	74.1
Central African Rep.	0.7	Malaysia	32.4	Greece	21.1	Belgium	79.2
Chile	10.1	Morocco	10.9	Hong Kong	40.8	Canada	66.9
Colombia	20.0	Nigeria	0.2	India	37.4	Denmark	67.0
Costa Rica	32.4	Pakistan	14.8	Israel	61.9	Finland	45.4
Dominican	6.9	Peru	10.3	Korean Rep.	34.9	France	80.3
Egypt	6.8	Philippines	15.0	Mexico	31.9	Germany	62.7
El Salvador	33.0	Senegal	18.7	Portugal	32.8	Ireland	61.3
Ghana	4.3	Sri Lanka	4.8	Singapore	66.9	Italy	59.0
Guatemala	32.7	Sudan	0.8	Spain	52.1	Japan	26.0
Guyana	19.6	Thailand	17.3	Taiwan, China	34.7	Netherlands	74.2
Haiti	46.3	Trinidad	14.3	Yugoslavia	50.7	New Zealand	25.9
Ivory Coast	13.4	Tunisia	17.3			Norway	44.4
Jamaica	14.4	Turkey	7.9			Sweden	68.3
Jordan	14.9					Switzerland	59.5
						UK	81.0
						USA	59.4
Average		Non-NICs	14.5	NICs	42	All NICs	58.9

Source Havrylynshyn and Civan (1985) p.260.

From Table 4.2, it is evident that average levels of intra-industry trade are highest in the trade of industrialized countries (58.9 per cent), since scale economies and product differentiation are common characteristics of manufacturing activity in these countries, this is expected.

Intra-industry trade levels in some NICs has reached levels in excess of industrialized country average i.e. Singapore and Israel, but however the average intra-industry trade for NICs is significantly less than that for the industrialized countries. Furthermore the average levels of IIT are lowest for the non-NIC countries. Similar results have also been confirmed by Lundberg (1982). Lundberg (1982) found that Swedish intra-industry trade with NICs in 1977 was 17 per cent, whilst for the non-NICs was 8 per cent. It would seem from the findings of Havrylynshyn and Civan (1985) and Lundberg (1982) that intra-industry trade is relatively unimportant in non-NICs but of growing importance in trade flows of NICs. The findings that intra-industry trade is more important in NICs than non-NIC could imply that the importance of intra-industry trade increases as development takes place.

4.3 THE LEVEL OF INTRA-INDUSTRY TRADE FOR SOUTH AFRICA AND ROW BY INDUSTRIES.

The statistical measures of intra-industry trade ($B_i, \overline{B}_I, \overline{C}_I$) developed in chapter three are employed in this section. The intra-industry trade indices are calculated for the years 1972 to 1993 at the three-digit and four-digit level at current Rands from the data published by the Industrial Development Corporation (1996) for South Africa. The intra-industry trade between South Africa and countries in the Southern African region as well

as countries in the PTA are also measured and reported. The sensitivity of the measures intra-industry trade to changes in the level of aggregation is also examined in this section.

Table A-1 provides the percentages of intra-industry trade (B_i indices) for primary commodities as well as manufactures for South Africa with rest of the world at the three-digit level at current Rands for the years 1972 to 1993. The first two columns of Table A.1 give the classification and descriptions of the three-digit classes. Table A.1 is split into two periods, taking into account the two liberalization episodes that were prevalent during the period 1972 to 1993. The average intra-industry trade is also presented for both primary commodities and manufactures. The absolute and percentage changes are provided for both liberalization episodes in order to assess the impact of trade liberalization on the level of intra-industry trade.

Before engaging in an analysis of intra-industry trade measures it is useful to draw on some of the characteristics of the period 1972 to 1993 covered in this study. The World Bank definition of trade liberalization (Michealy et *al.* 1991) includes any act that would make a trade regime more neutral, in the sense that it reduces the bias towards the production for the domestic market and against exports. The primary acts of trade liberalization includes, producing a shift towards neutrality; are relaxation of quantitative restrictions (QRs) and tariff reductions, it also includes direct export promotion measures, such as export subsidies, which clearly increase the incentive to export relative to production for the home market. Furthermore, such acts are generally accompanied by currency devaluation, which is seen as a crucial instrument of trade liberalization. The principal attributes of trade liberalization are the relaxation of QRs, reduction of tariffs,

devaluation and export promotion measures (Michealy 1991:64). South Africa has had two 'liberalization episodes': one relatively mild, lasting from about 1972 to 1976. the second, more thoroughgoing, beginning in 1985. The World Bank defines a 'liberalization episode' as a period lasting two or more years, involving significant policy changes towards trade liberalization.

During the first liberalization episode (1972 to 1976) significant efforts were made to switch from import substituting to export-orientation industrialization. The first was the publication of the Commission of Inquiry into the Export Trade of the Republic of South Africa (the Reynders report). This report emphasized the need for South Africa to rely less on gold exports for foreign exchange earnings, and to diversify its exports. The Reynders Commission did not propose any specific export incentive scheme. In 1972 a new export incentive measure was introduced, in the form of Export Development Assistance, which involved a tax allowance for marketing expenses incurred in connection with exporting. Also in 1972, the authorities began to dismantle QRs on imports, but the process of dismantling the QRs was very slow. QRs were gradually relaxed in 1972 to 1976. There was a substantial real appreciation of the Rand during the gold-led boom of 1973-1974, which impeded trade liberalization. The increase in the gold price in 1979 to 1980, which resulted in a major real appreciation of the Rand, and a relative shift in resources from the production of tradable manufactures to non-tradable (goods and services which are not normally imported or exported), represented a substantial reversal of trade liberalization achieved earlier in the decade.

In 1977 the Van Huysteen Committee was appointed to review the system of export incentives. From the Van Huysteen Committee's recommendation a new, reinforced system of export incentives was introduced in September 1980. The introduction of this system coincided with the massive real appreciation of the Rand and with the onset of the world recession, and hence with the beginning of a sharp decline in South Africa's exports. Despite declining exports, in 1983 the government embarked on a programme of both foreign exchange liberalization and substantial further relaxation of QRs. In February 1983, following a partial recovery of the gold price, the dual (commercial and financial Rand) exchange rate system was abolished, thereby effectively abolishing exchange controls on non-residents. The Department of Trade and Industry was appointed in 1982 to look into the question of relaxing QRs and on its recommendation the dismantling of QRs was resumed in 1983. The proportion of the value of imports subject to QRs fell from 77 per cent in 1983 to 55 per cent in 1984, and 23 per cent in 1985. The proportion of tariff items subject to QRs decreased to 28 per cent (IDC 199b: 36). Thus taking the effect of QRs and tariffs together, there was a major reduction in the level of protection in the period 1983 to 1985. Since 1985, there has been a substantial relaxation of QRs. In 1985, the proportion of South Africa's imports subject to import controls decreased to 23 per cent, by the end of 1991.

There has been a tendency for the degree of trade liberalization to increase since 1985, as a result of the implementation of structural adjustment programmes for the motor vehicles and textile-clothing industries. In April 1990, the export incentive scheme of 1980 was replaced by a new and more powerful system of export subsidies, the General Export Incentive Scheme (GEIS). Taking into account the further relaxation of QRs, the

structural adjustment programmes, and export subsidies it is evident that there was a further significant tendency towards trade liberalization in 1985 to 1993.

Careful examination of Table A-1 shows that there is considerable variation in the level of intra-industry trade for each of the individual three-digit industries. The B_i index is a static indication of intra-industry trade in an industry. A low value of B_i for an industry indicates a low proportion of intra-industry trade, and thus a high degree of inter-industry specialization in trade, where exports are much greater than imports, or vice versa. Such an industry may be categorized as a net export or net import industry, depending on whether exports or imports predominate. A high value of B_i index for an industry (such as 60 per cent) would indicate a high proportion of intra-industry trade, or substantial trade overlap, where exports and imports are both important.

From Table A-1, generally (1110) Agriculture and (2) Mining have lower B_i values (percentages) than manufactures. The average intra-industry trade for manufactures is larger than the average for primary commodities for all the years, showing that much of the extent of intra-industry trade takes place in manufactured commodities. It is remarkable that there is significant intra-industry trade in every manufacturing industry. It is interesting to note that of all the three-digit manufacturing industries (Table A-1) only (384) Motor Vehicles and Parts had an average below 20 per cent for the period 1972 to 1993. A possible reason could be the high levels of protection given to the motor vehicle industry (Table 4.3). It is also interesting to note that (313) Beverages, (331) Wood and Wood Products and (371) Iron and Steel Basic Industries had averages over 80

per cent for the period 1972 to 1993. The impact of trade liberalization had a significant influence on the level of intra-industry trade in each industry. The percentages of intra-industry trade for each industry in most cases are lower for the period before 1984 than after 1984. This could be possibly due to the fact that the percentage contribution of manufactured exports to total exports rose from 1985 to 1990, achieving the highest positive annual growth rate (10.78 per cent) of any of the main economic sectors (Bell and Cattaneo: 1993). Bell (1995) attributes this accelerated growth of manufactured exports to the depreciation of the Rand in 1983-1986. In the early 1990s, although there was a decline in manufactured exports, at an annual rate of 2.60 per cent in 1990-93, despite the introduction of the GEIS in 1990 (Bell and Cattaneo: 1993) the level of intra-industry trade for most industries during that period was high for most sectors.

It is interesting to note from Table A-1, that high percentages of intra-industry trade which is more than 60 per cent in (1110) Agriculture from 1984 to 1995, which do not fall in the category of manufactures. There are some non-differentiated products with high levels of intra-industry trade, these are (314) Tabacco products which has intra-industry trade values over 90 per cent for the years 1979 to 1984, (324) Footwear which has values of over 70 per cent for the years 1979,1986,1987,1988,1989 and 1990, (331) Wood and Wood products which has intra-industry trade values of more than 70 per cent for the years 1977 to 1992 and (372) Non-ferrous metal basic industries which has intra-industry trade values more than 70 per cent for the years 1972 to 1976. Although (321) textiles have relatively high levels of protection, the average intra-industry trade value for the period 1972-1993 is quite high at 77 per cent. Highly protected sectors such as (322) clothing (356) plastic products and (384) motor vehicles have relatively low average

intra-industry trade values; 49 per cent, 37 per cent and 19 per cent for the period 1972-1993 respectively. Table 4.3 provides the levels of protection given to (321) textiles, (322) clothing, (356) plastic products and (384) motor vehicles.

TABLE 4.3
EFFECTIVE RATES OF PROTECTION: THREE-DIGIT LEVEL

SECTOR	1984/5 EFFECTIVE RATES OF PROTECTION
TEXTILES	40.1
CLOTHING	39.3
PLASTIC PRODUCTS	53.6
MOTOR VEHICLES AND PARTS	16.3

Source: Holden (1990)

According to Greenaway (1991:166), intra-industry trade is more likely to be recorded in capital-intensive sectors than in labour-intensive sectors. Havrynlyshyn and Civan (1985) examined the link between factor intensity and intra-industry trade and found that in the NICs in their sample intra-industry trade was more likely to be recorded in capital-intensive sectors than labour-intensive sectors. Cattaneo (1998) reported that SACU's manufactured export to the rest of the world was more labour-intensive than its manufactured imports from rest of the world. SACU's exports to Zimbabwe, on the other hand, are significantly less labour-intensive than SACU's imports from Zimbabwe.

From Table 4.4 it is clear that higher values of intra-industry trade are found in capital-intensive sectors than labour-intensive sectors. From Table A-1, it can be seen that high intra-industry trade values are recorded in capital-intensive sectors and low intra-industry trade values are recorded in labour-intensive sectors for most of the years under study.

TABLE 4.4
FACTOR INTENSITY AND INTRA-INDUSTRY TRADE

SECTOR	K/L ratio	AV IIT (72-93 SA with ROW
CAPITAL-INTENSIVE		
Chemical products	378.45	58
Iron and steel basic industries	255.92	83
Paper and paper products	143.87	67
Beverages	120.49	92
Non-ferrous metal basic industries	116.61	42
INTERMEDIATE-CAPITAL-INTENSIVE		
Glass and glass products	110.15	21
Other non-metallic mineral products	87.41	63
Tobacco products	58.74	66
Other transport equipment	54.46	23
Motor vehicles and parts	49.38	19
Rubber products	47.61	77
Food	47.00	63
LABOUR-INTENSIVE		
Electrical machinery	36.68	20
Machinery	34.39	62
Printing and publishing	33.62	21
Metal products	27.56	41
Plastic products	27.46	37
Textiles	27.05	77
ULTRA-LABOUR-INTENSIVE		
Pottery, china and earthenware	24.81	32
Wood and wood products	21.74	81
Other manufacturing industries	16.73	37
Leather products	13.58	73
Furniture	12.05	23
Footwear	8.27	59
Clothing	4.46	49

Own Computations from IDC Data base (1996).

4.4 AGGREGATION AND MEASURED INTRA-INDUSTRY TRADE

TABLE: 4.5
SUMMARY INDICES: INTRA-INDUSTRY TRADE BETWEEN S.A. AND ROW AT CURRENT RANDS

THREE DIGIT LEVEL							FOUR DIGIT LEVEL						
YEAR	$\overline{B}_i$	$\overline{C}_i$	Q_i	$C_j - AV$	$B_i - AV$	$Q_j - AV$	YEAR	$\overline{B}_i$	$\overline{C}_i$	Q_i	$B_i - AV$	$Q_j - AV$
72	50	75	54	53	56	54	**72**	48	68	52	50	57
73	47	75	53	52	55	52	**73**	44	68	48	47	55
74	42	77	43	49	51	51	**74**	40	70	48	44	53
75	42	76	48	49	52	53	**75**	39	67	42	43	51
76	43	70	46	49	52	52	**76**	39	60	52	43	50
77	46	62	43	51	54	67	**77**	40	52	57	46	66
78	45	61	31	48	51	47	**78**	39	50	55	46	78
79	46	61	41	48	50	47	**79**	39	50	58	47	49
80	42	64	42	45	48	46	**80**	37	54	58	45	49
81	40	68	43	43	46	47	**81**	35	58	55	43	51
82	40	67	43	42	44	45	**82**	35	57	48	42	47
83	41	65	42	41	44	41	**83**	36	55	50	42	47
84	40	66	41	38	41	40	**84**	36	57	53	37	47
85	47	61	42	44	47	43	**85**	42	52	73	44	68
86	49	61	44	46	50	46	**86**	44	52	67	47	50
87	50	62	44	47	53	48	**87**	46	55	68	48	51
88	51	65	44	49	55	52	**88**	47	59	71	49	45
89	52	64	44	50	57	56	**89**	49	58	67	52	52
90	53	63	47	53	58	57	**90**	50	58	62	54	55
91	52	65	48	53	58	57	**91**	50	60	62	53	28
92	52	67	49	54	59	58	**92**	50	62	61	53	56
93	52	67	49	54	59	11	**93**	50	62	61	53	57

Own Computations from IDC Data base (1996). AV = average

Whether intra-industry trade is a real phenomenon is questioned by Finger (1975) and Vona (1990) on the grounds that there is as much variation in factor intensity between the same industrial groups as there is between different industries. Thus is intra-industry trade merely a statistical artifact resulting from inappropriate disaggregation of data to

represent industries with unique factor ratios? Nolle (1990) found that intra-industry trade among developing countries in particular could be explained by data aggregation, although these results were weak. Gray (1979), on the other hand found that intra-industry trade remains even at a very fine level of disaggregation of trade data. Balassa (1986, 1987) maintains that establishing meaningful industry categories rather than disaggregating further is the solution to the problem of 'Heckscher-Ohlin' trade in disguise. This raises the question which set of data to use, there seems to be a general agreement that the three-digit Standard International Trade Classification (SITC), and the corresponding Standard Industrial Classification (SIC) are appropriate for the definition of an industry in empirical studies of international trade. Balassa (1986, 1987) adapts the United States Standard Industrial Classification (SIC), but others make use of the United Nations (UN) trade data classified by the Standard International Trade Classification (SITC). There appears to be a general consensus that intra-industry trade is indeed a real phenomenon, of considerable significance, particularly between the developed countries but also between developed and developing countries, as well as among the developing countries.

In chapter three it was noted that a country's trade imbalance introduces a downward bias into the measure of intra-industry trade, which can be eliminated by an appropriate adjustment. Table 4.5 show the $\overline{B}_i$ and $\overline{C}_i$ values for the years 1972 to 1993 at current Rands for South Africa and the rest of the world at the three-digit and four-digit SIC level. The average B_i index is also provided in Table 4.5. $\overline{C}_i$ values are larger than $\overline{B}_i$ values for all the years in Tables 4.5 as predicted. Similar results are reported in Table A-35.

To test the assertion that intra-industry trade is merely a statistical artifact caused by excessive aggregation, the average B_i values are computed and reported at the three-digit and four-digit level in Table 4.5. If the causes of intra-industry trade were merely statistical, one should expect the average intra-industry trade share for each year to be substantially reduced as we move to a more disaggregated level. The B_i index is larger at the three-digit level than at the four-digit level shown in Table 4.5. Table 4.5 shows the sensitivity the intra-industry trade phenomenon is to the level of data aggregation. This may also point out to the considerable variation in factor intensity within the product groups, this could also be as a result of improper data aggregation in the SIC classification. Measured intra-industry trade increases as the degree of aggregation increases. Both the $\overline{B}_i$ and $\overline{C}_i$ values are larger at the three-digit level than at the four-digit level. The increase in the measure depends on the extent to which the differences between exports and imports of sub-industries are of different signs.

Table A-2 shows the values B_i at the four-digit level for South Africa and the rest of the world at current Rand (SIC) for primary commodities, manufactures and services. Intra-industry trade are also recorded for both services and primary commodities. The industries which show high levels of intra-industry trade for manufactures at three-digit level (Table A-1) generally have sub-industries at the four-level digit level which have high levels of intra-industry trade (Table A-2). If intra-industry trade was a statistical novelty as argued by Finger (1975) and Vona (1990), then one would expect intra-industry trade to disappear as one moves to a lower level of aggregation. This is not the case for South Africa as shown by the average B_i in Table 4.5. The level of intra-

industry trade for each industry does not disappear as one moves from the three-digit level (Table A-1) to the four digit level (Table A-2). From Table 4.5 it can be seen that the differences in the average intra-industry trade at the three-digit level and four-digit level are very small. Evidence of the concept of intra-industry trade still existing at a very fine level of aggregation is also reported by Grubel and Lloyd (1975), Gray (1979) and Pomfret (1979).

4.5 TRENDS IN INTRA-INDUSTRY TRADE BETWEEN SOUTH AFRICA AND MAJOR TRADING PARTNERS, COUNTRIES IN SOUTHERN AFRICAN REGION AND COUNTRIES IN PREFERENTIAL TRADING AREA (PTA).

TABLE: 4.6

UNADJUSTED GRUBEL AND LLOYD (1975) $(\overline{B}_i)$ INDICES: BETWEEN SA AND MAJOR TRADING PARTNERS AT THE TWO-DIGIT LEVEL (CURRENT RANDS)

COUNTRY	1989	1993
JAPAN	83	59
GERMANY	41	46
NETHERLANDS	57	80
UNITED KINGDOM	62	76
UNITED STATES	57	62
TAIWAN	99	97
BELGIUM	77	71
ITALY	91	82
KOREA	61	82
HONG KONG	73	79
SWITZERLAND	99	29
ZIMBABWE	63	55
ISREAL	74	46
FRANCE	67	53

Source: Own Computations from Department of Customs and Excise and IDC Data base (1996).

TABLE: 4.7

UNADJUSTED GRUBEL AND LLOYD (1975) $(\overline{B}_i)$ INDICES: BETWEEN SA AND COUNTRIES IN SOUTHERN AFRICAN REGION AT THE TWO-DIGIT LEVEL (CURRENT RANDS)

COUNTRY	1989	1990	1991	1992	1993	AV(89-93)
ANGOLA	69	0	0	0	1	**14**
BOTSWANA	3	1	43	37	16	**20**
LESOTHO	13	10	24	16	18	**16**
MALAWI	24	32	27	32	42	**31**
MOZAMBIQUE	9	12	10	13	12	**11**
NAMIBIA	73	0	25	67	21	**37**
SWAZILAND	17	75	40	55	27	**43**
TANZANIA	70	37	17	57	55	**47**
ZAMBIA	3	2	4	7	11	**5**
ZIMBABWE	63	55	46	69	55	**58**

Source: Own Computations from Department of Customs and Excise and IDC Data base (1996).

TABLE: 4.8

UNADJUSTED GRUBEL AND LLOYD $(\overline{B}_i)$ INDICES: BETWEEN SA AND COUNTRIES IN PTA AT THE TWO-DIGIT LEVEL (CURRENT RANDS)

COUNTRY	1989	1990	1991	1992	1993
ANGOLA	69	0	0	0	1
BURUNDI	0	0	7	0	2
COMOROS	2	2	6	2	2
DJIBOUTI			0	0	0
ETHOPIA	0	31	24	25	15
KENYA	75	60	74	27	26
LESOTHO	13	10	24	16	18
MADAGASCAR	3	5	12	22	13
MALAWI	24	32	27	32	42
MAURITIUS	8	9	7	6	8
MOZAMBIQUE	9	12	10	13	12
NAMIBIA	73	0	25	67	21
RWANDA	3	62	57	3	15
SEYCHELLES	2	1	4	2	3
SOMALIA	0	3	2		1
SUDAN	8	1	18	3	34
SWAZILAND	17	75	40	55	27
TANZANIA	70	37	17	57	55
UGANDA	50	7	25	3	21
ZAIRE	23	3	9	25	73
ZAMBIA	3	2	4	7	11
ZIMBABWE	63	55	46	69	55

Source: Own Computations from Department of Customs and Excise and IDC Data base (1996).

The intra industry trade values in Tables 4.6, 4.7 and 4.8 were calculated from data supplied by Department of Customs and Excise and the Industrial Development Corporation (1996). Tables 4.6, 4.7 and 4.8 provides the unadjusted Grubel and Lloyd $(\overline{B}_i)$ indices for South Africa and its major trading partners of the world at the two-digit level for the years 1989 and 1993, and countries in the Southern Africa region and countries in the PTA at the two-digit level for the years 1989 from 1993 respectively.

From table 4.6, 4,7 and 4.8, it is evident that much of South Africa's intra-industry trade takes place with major trading partners, than with countries in Southern African region or with countries in the PTA because of higher $(\overline{B}_i)$ values. As can be seen from Table 4.6 the $(\overline{B}_i)$values are more than 50 per cent except in the case of Germany where the $(\overline{B}_i)$ value is less than 50 per cent for both the years, Switzerland in 1993 and Israel in 1993. The $(\overline{B}_i)$ values for South Africa and its major trading partners has decreased from 1989 to 1993 for the following countries: Japan, Taiwan, Belgium, Italy, Switzerland, Zimbabwe, Israel and France. The $(\overline{B}_i)$ values in all these cases have decreased by small amounts except Switzerland where the decrease was quite large in the region of 70 per cent. Increases of the $(\overline{B}_i)$ were recorded for Germany, Nertherlands, United Kingdom, United States, Korea and Hong Kong. In most cases the increase were small.

With reference to Table 4.7 the $(\overline{B}_i)$ values for South Africa and countries in the Southern African region is low in most cases except Zimbabwe. Some high $(\overline{B}_i)$ values in 1989 are recorded for Angola (69 per cent), Namibia (73 per cent) and Tanzania (70 per cent). In 1990 the $(\overline{B}_i)$ value was 75 per cent for Swaziland. Of interest is the $(\overline{B}_i)$ value of Zimbabwe, which is more than 45 per cent for all the years (Table 4.7) and highest for all the countries in the region for 1991, 1992 and 1993. Zimbabwe recorded the highest average $(\overline{B}_i)$ value of 58 per cent (Table 4.7) for the period 1989 to1993. The high levels of intra-industry trade with South Africa and Zimbabwe could be as a result of these countries having similar resource endowments, levels of development, geographic and/or economic, cultural distance and similar industrial structures. Similar

results were found by Grubel and Lloyd (1975), where Australia's highest values of intra-industry trade were recorded with New Zealand and South Africa. These countries have similar resource endowments and levels of development similar to Australia. The intra-industry trade values for South Africa with countries in PTA (Table 4.8) are very low, suggesting that South Africa's intra-industry trade is larger with it's major trading partners than with countries in the PTA.

TABLE 4.9
SHARES OF INTRA-INDUSTRY TRADE IN TOTAL TRADE WITH THE REST OF THE WORLD IN 1980

COUNTRY	ROW
AUSTRALIA	35.8
BELGIUM	79.7
CANADA	58.5
FRANCE	80.4
GERMANY	65.4
ITALY	65.4
JAPAN	28.8
NETHERLANDS	74.2
SWEDEN	66.5
U.K	79.1
USA	60.7
*SA	42.1

SOURCE: CULEM AND LUNDGERG (1986)
* OWN COMPUTATION

Table 4.9 presents data on the average share of intra-industry trade for each of eleven industrialized countries' trade with the rest of the world in 1980 at the four-digit SIC level. For comparative purposes the average share of intra-industry for South Africa is included in the Table 4.9. It is interesting to note that the average share of intra-industry trade for South Africa is lower than all the countries except Japan.

The low intra-industry trade value for South Africa may reflect high barriers to trade, in the form of transport costs as well as tariffs and non-tariff barriers. High rates of protection will impede intra-industry trade. South Africa has a large dispersion and generally high rates of tariff protection. Table 4.10 shows that products tend to be more highly protected the further up the chain of manufacture they are found. Capital Goods and many primary products draw very low tariffs.

Table 4.11 shows the enormous spread of tariff levels. A World Bank study (Belli, 1993) has indicated that of a representative sample of 32 developing countries, the coefficient of variation of South Africa's tariff (including the ad varolem equivalents of formula duties) is higher than all but one (other) extreme case. Moreover, South Africa has more tariff rates than any other country in the study, the widest range of tariffs, and the highest individual rate, at 1389 per cent, more than double the second highest rate, Egypt's 600 per cent.

TABLE 4.10
AVERAGE NOMINAL LEVEL OF PROTECTION BY STAGE OF PRODUCTION

STAGE OF PRODUCTION	Nominal Average Tariff	Weighted Average Surcharge	Total Protection Effect
Primary Products	2.5	0.6	3.1
Processed Primary Products	12.0	2.5	14.5
Materials-intensive	28.3	5.7	34.0
Manufactured Products	26.9	13.4	40.3
Capital Goods	9.8	10.4	20.2

Source: IDC 1990c

TABLE 4. 11
THE INCIDENCE OF NOMINAL PROTECTION IN MANUFACTURING

Nominal Protection Range	Ad Valorem Duty		Formula Duties		Import Controls
	No of Lines	%	No of Lines	%	% of Lines
0	2 832	29.5	0	0.0	24.2
1-10	2 466	25.6	3	0.2	17.3
11-15	922	9.6	5	0.3	28.9
16-20	1 956	20.3	95	4.9	22.2
21-25	743	7.7	58	3.0	21.4
26-30	505	5.3	308	15.9	18.9
31-35	75	0.8	80	41.4	10.3
36-40	100	1.0	61	3.2	25.5
More than 40	16	0.2	1319	68.4	31.7
Totals	9615	100	1929	100	22.9

SOURCE:IDC 1990c

4.6 EMPIRICAL PERFORMANCE OF THE DIFFERENT INDICES OF INTRA-INDUSTRY TRADE.

In this section the magnitude of the differences and performance of $\overline{B}_I$, $\overline{C}_I$ and Q_I is presented in Table 4.12.

TABLE 4.12
COMPARATIVE INDICES FOR 1972

COUNTRY	$\overline{B}_I$	$\overline{C}_I$	Q_I	$\frac{Q-B}{B}\%$	$\frac{Q-C}{C}$
CANADA	66.3	87.6	73.5	10	-16
UNITED STATES	57.4	58.1	57.3	-0	-1
AUSTRALIA	40.8	85.3	58.5	43	-31
JAPAN	30.0	88.5	54.8	82	-38
BELGIUM	70.1	79.3	70.1	0	-11
DENMARK	70.7	84.3	70.3	-0	-16
FRANCE	86.5	93.1	87.4	1	-6
WEST GERMANY	62.5	92.4	76.0	21	-17
IRELAND	55.2	94.8	64.5	16	-31
ITALY	66.6	91.7	72.3	8	-21
NETHERLANDS	78.6	80.6	78.7	0	-2
UNITED KINGDOM	76.0	96.8	81.9	7	-15
AUSTRIA	73.4	85.7	75.0	2	-12
GREECE	26.5	88.3	35.7	34	-59
NORWAY	69.2	97.2	72.5	4	-25
PORTUGAL	39.1	56.2	40.9	4	-27
SPAIN	43.8	56.3	49.1	12	-12
SWEDEN	75.6	77.4	76.3	0	-1
SWITZERLAND	60.5	61.4	60.9	0	-0
YUGOSLAVIA	53.3	68.0	55.3	3	-18
BRAZIL	25.5	80.8	49.8	94	-38
MEXICO	36.6	89.1	54.8	49	-38
INDIA	21.7	24.3	22.9	5	-5
SINGAPORE	53.6	88.7	71.4	33	-19
KOREA REPBULIC	37.5	41.9	39.2	4	-6
HONG KONG	39.5	42.6	39.2	0	-8
*SOUTH AFRICA	50	75	54	8	-28

SOURCE: AQUINO (1978). * Own computations.

Aquino (1978) reports that in most cases $\overline{B}_I$ is a substantially downward bias index of intra-industry trade and $\overline{C}_I$ an upward bias measure of intra-industry trade. Computations for the South African manufacturing is included in the Table 4.12, the results also confirm that $\overline{B}_I$ is downward bias measure and $\overline{C}_I$ is an upward bias measure of intra-industry trade (Table 4.5). The size of the bias is very high for the countries with a large imbalance in total trade of manufactures. Similar results are also reported in Table A-35.

From Table 4.5, it can be seen that Q_I values for South Africa and the rest of the world in most cases lie between the $\overline{B}_I$ indices and $\overline{C}_I$ indices. This is also confirmed in Table A-35. For comparison purposes Table A-6 presents the B_i and Q_i indices for the years 1972, 1984, 1985 and 1993 for South Africa and rest of the world at the three-digit level. The differences for all the years in question are quite small in many cases. The average Q_I values are less than 60 per cent for all the years at both digit levels (Table 4.5). A time series analysis of the Q_i indices is presented in Table A-3 at the three-digit level and the four-digit level indices are presented in Table A-4 at current Rands.

4.7 EVALUATING THE IMPACT OF CATEGORICAL AGGREGATION

Detailed examination of the possible influence of categorical aggregation are few. Two notable exceptions are Finger's (1975) work on SITC and Rayment's (1976) work on the U.K. SIC. Both suggest that there may be a great deal of variability in factor input ratios within the three-digit categories, a result which cautions against the uncritical use of B_I at the three-digit level. When factor ratios differ between sub-groups in a given third-digit

category, measurement of B_i is really meaningless because a 'high index' would be quite consistent with the Hecksher-Ohlin theory, however the third-digit of the SIC and SITC classifications remains the most popular level of statistical aggregation for calculating B_i. The SIC and SITC are most typically associated with an 'industry'.

If no adjustment is made for categorical aggregation, there could be problems interpreting and analyzing empirical results. There are at least three ways in which one can attempt to analyze the impact and influence of aggregation bias, namely:

(a) Measurement at a lower level of statistical aggregation

(b) Measurement according to alternative classification systems

(c) Computation of an alternative index.

4.7.1 EFFECTS OF CATEGORICAL AGGREGATION ON INTRA-INDUSTRY TRADE FOR SOUTH AFRICA.

In order to determine the influence of categorical aggregation in South Africa at the three and four digit level, the average B_i indices upon aggregation are compared and reported for the years 1972 to 1993 in table 4.5. The procedure for evaluating the effects of categorical aggregation is to monitor the behaviour of the indices upon aggregation. This method is employed by Grubel and Lloyd (1975); Gray (1979); Pomfret (1979). One would expect that the unweighted average levels of intra-industry trade to decrease as one disaggregates to more specific product lines. According to Greenaway and Milner (1983, 903) ' if the average levels of intra-industry trade fall substantially from one digit to another then this could be an indication of the presence of categorical. aggregation'.

Comparing the average B_i indices in Table 4.5 for South Africa using the SIC classification, one finds that the average intra-industry trade values (B_i) are decreasing as one moves from the three-digit level to the four digit level for all the years, suggesting the possibility of categorical aggregation. Similar results are found by Greenaway and Milner (1983), when comparing the average intra-industry trade at the three-digit, four-digit and five-digit levels of the SITC for the United Kingdom in 1977. The authors conclude that that there are no absolute standards against which one can evaluate the precise significance of any decline.

The second procedure is to analyze B_i indices according to alternative bases of classification and collection may also be instructive, especially where the bases to the classification systems differ. Greenaway and Milner (1983) use the example of U.K trade data to explain this procedure. The U.K trade data is classified according to both SIC and SITC systems. SIC distinguishes between activities according to process characteristics, whilst the SITC system emphasizes product characteristics. According to the authors it is possible to 'marry' the two classifications by regrouping third, fourth and fifth- digit SITC data into SIC Minimum List Heading. This enables one to compare B_i indices from the two data sets.

The third procedure suggested by Greenaway and Milner (1983) is also adopted in this study. In order to overcome the aggregation problem is to compute an alternate adjusted index C_j of intra-industry trade at the three-digit as discussed in chapter three.

In Table 4.5 the average C_j is computed and reported at the SIC three-digit level. When compared to the average B_i in Table 4.5, C_j is falling in all cases. Greenaway and Milner (1983) found similar results for United Kingdom and Switzerland in 1977. When compared with the average B_i the adjusted index accommodate both the offsetting imbalance effect, as well as providing an index which is a trade weighted average of sub-group indices. Greenaway and Milner (1983) argue that when C_j rather B_i is used , the opposite sign imbalances offset each other and the resultant measure is free of distortions.

From the results obtained in Table 4.5, it is evident that there exists problem of categorical aggregation, which will overstate South African's intra-industry trade. Therefore the C_j index is an appropriate measure of intra-industry at the 'industry' level. The C_j values are computed and reported for each industry at the three-digit industry level in Table A-5.The C_j values (Table A-5) are smaller or equal B_i values (Table A-1) for all the years.

A comparative breakdown for B_i, Q_i and C_j values is given in Table A-6 for years 1972, 1984, 1985 and 1993 at the three-digit SIC category, $B_i \geq C_j$, as expected. In most case Q_i is larger than C_j at the three-digit level.

Table 4.13 provides possible sources or determinants of intra-industry trade.

TABLE: 4.13

SOURCES OF INTRA-INDUSTRY TRADE

1. Taste similarity: Greater IIT will be associated with countries that have taste overlap.
2. Attributed differentiation: Greater IIT will be associated with greater attribute differentiation of products.
3. Scale economies: Greater IIT will be associated with greater scope for scale economies.
4. Market Structure: IIT will be greater in those industries that are monopolistically competitive.
5. Technological factors: IIT will be greater when there exists the possibility of technological or vertical product differentiation.
6. Distance: IIT will tend to be greater when the trading partners are geographically close.
7. Tariff and other barriers: IIT will be larger, the lower the trade barriers.

Source: Greenaway and Milner (1986).

4.8 CONCLUSION

Section 4.2 it was noted that the intra-industry trade level for South Africa was low, around 35 % Simson (1987) and Parr (1992). This is relatively low compared to industrialized countries and par with newly industrialized countries. In this study the levels of intra-industry trade was calculated at both the three-digit and four-digit SIC level and reported in section 4.3. A brief review of the period under study was drawn upon. It was concluded that the levels of intra-industry trade was lower during the first trade liberalization 'episode' in most cases, than the second trade liberalization 'episode', suggesting that the effects of trade liberalization had some impact on the trends and levels of intra-industry trade in most industries. Relatively low levels of intra-industry trade in certain industries could be as a result of the high rates of protection given to that specific industries or the large variation of factor intensity within those industries. It was also noted in this section that high values of intra-industry trade was recorded in capital-intensive sectors than labour- intensive sectors. Intra-industry trade was also recorded for primary commodities as well as services.

Although the levels of intra-industry trade has increased from 1972 to 1993, it remains relatively low when compared to other newly industrialized countries, suggesting that there is much scope for intra-industry trade. It was also noted that the levels of intra-industry trade for South Africa is greatest with its major trading partners than with countries in the region or with countries in the PTA. It was also concluded that the levels of intra-industry trade still remains even at a very fine level of aggregation, dismissing

the notion that intra-industry trade is merely a statistical novelty. The impact of categorical aggregation was investigated; it was found that there exists the possibility of categorical aggregation in South Africa, thus inflating the level of intra-industry trade. To overcome this problem the adjusted C_j index was calculated, as well as calculating the level of intra-industry trade at a lower level of aggregation, to get a more realistic picture of intra-industry trade in South Africa. Given the results, intra-industry trade is a real phenomenon in South Africa, although low. Together with the social and political changes in South Africa and the commitment to GATT, intra-industry trade is surely to become a striking phenomenon and there is much to gain in terms of welfare for the country.

CHAPTER FIVE

REGIONAL INTEGRATION AND INTRA-INDUSTRY TRADE

5.1 INTRODUCTION

There is a growing literature that addresses the question of the trade in an imperfect competitive market, which suggests the possibility of benefits of trade significantly in excess of those linked with 'conventional gains' from trade, largely due to scale economies (Greenaway 1991:168). The literature stresses the role of market imperfections such as oligopoly, non-production costs and product differentiation; all of which are clearly important in the real world. The effects of economic integration in the context of imperfect competition are an important aspect of international trade theory. An important feature on the effects of trade in the context of imperfect competition, however it is the recognition of product differentiation coupled with scale economies that allow the prospect of intra-industry trade and specialization.

The term economic integration refers to the process of eliminating restrictions to international trade, payments, and factor-input mobility. Mankiw (1988) sees trade in some ways, as a type of technology in the sense removing a trade restriction, such as a tariff, would lead to more rapid economic growth because the removal of trade restriction acts just like an improvement in technology. The chapter is organized as follows; section 5.2 examines the concept of regional integration in the context of international trade, section 5.3 sets out the forms of economic integration within Southern Africa, this section also provides the reader with a brief summary of the major trade policy reforms under taken in the region, section 5.4 discusses intra-industry trade and economic integration,

section 5.5, 5.6, 5.7 and 5.8 looks at trade liberalization and intra-industry trade, the demand and supply side, welfare effects of intra-industry trade and intra-industry trade within a regional context respectively, section 5.9 examines South Africa's and SACU trade within the Southern African region, section 5.10 provides the levels and trends of intra-industry trade with SACU with SADC, South Africa with ROW and SACU with ROW, section 5.10 also looks at intra-industry trade between SACU and regions of the world, and section 5.11 concludes.

5.2 REGIONAL INTEGRATION IN THE CONTEXT OF INTERNATIONAL TRADE

In recent years regional trading arrangements have proliferated in every corner of the world and Africa is no exception to this trend. Hazlewood (1991: 601) writes, ' the case for integration is not a case for helping others; but a case for helping oneself.' But the realization of national self-interest depends on the member countries gaining from integration. '...it must be appreciated that regional integration will not benefit one country, or any rate not for long, unless it also benefits the others: the case for integration arises from self-interest, but the pursuit of self-interest requires the interest of others to be simultaneously served. Integration will not succeed unless every partner benefits, because any one who thinks he will not benefit will not participate, and there will be no integration. The benefit is for everyone or no one.' Hazlewood (1991:601). A positive sum outcome of integration is important.

For Syrquin (1989: 57) trade is the 'most variable element influencing a country's production structure'. Primary goods export decrease in importance as development

occurs. The composition of imports shifts from consumer goods to immediate goods and then to capital goods. Commodities such as food products and textiles will dominate at low levels of income (Hoffman, 1958; Chenery, 1979). As income levels rise, intermediate goods, and finally capital and high technology goods are produced (Taylor, 1989; Killick, 1990). At high levels of income, intra-industry trade becomes an important feature of trade, with manufactured goods dominating imports.

Large countries generally seem to have both market size and the capacity in terms of resources to sustain domestic production. On the other hand, small developing countries frequently lack the capacity, industrial skill and entrepreneurial capabilities to produce goods marketable in the larger and usually more developed countries. According to (Kuznets, 1960), economies of scale are seen as the main reason for countries having low foreign trade ratios. Because of country's large domestic demand, producers can build plants to take advantage of economies of scale. Country size has an important impact on the composition of foreign trade. Large countries have a higher level of manufactured exports than smaller countries, especially at low levels of *per capita* income have a lower level of manufactured exports (Keesing, 1968; Chenery and Syrquin, 1975; Perkins and Syrquin, 1989). Larger markets provide a stimulus for manufacturing exports because of economies of scale (Balassa, 1969).

Economic and political considerations are generally the main motivations for regional integration. Political considerations may include the desire to use integration to increase a country's negotiating power with third parties or as a means of improving political

relations among the integrating countries. But the main rational behind integration has been the desire to achieve economic development, industrial development and technological development. According to Mytelka (1975: 240) ' Integration in many developing areas of the world is.. a paradigm for industrialization.'

Smaller countries see increased market size and preferential access to a protected market as in important element to stimulate industrial development and growth. It is often argued that, the larger size of the integrated area and the more homogenous the countries are in terms of degree of economic size and degree of industrial development achieved at the onset of the integration process, the more likely is it that the integration process will be successful. Increased market size allows for the implementation of infant industry protection in a regional context. Infant industry protection allows for improvements in quality control, marketing techniques and competitiveness, which are important criteria for success in the world market (Linder, 1966; Jaber, 1970).

According to Morawetz (1974), intra-regional trade could provide a stimulus for product diversification and improved competitiveness and allow for entry in the world market. The increased size of the market after integration can also allow the realisation of economies of scale. Economies of scale as been seen as one of the dynamic effects of integration, applicable to countries with small domestic markets (Pearson and Ingram, 1980). The dynamic effects of economic integration refer to the possible ways in which integration may influence the rate of GNP of member countries in a regional union, in contrast to static effects, which results in a once-and-for all welfare change.

The intention of integration is not to gain a once-off raise in welfare, associated with the static impact of integration, but to enhance the rate of GDP growth and structural change through industrialization. By trading their manufactures instead of importing them from the industrialized countries, industrialization in the integrating developing countries increase industrial production through trade diversion i.e. case in which trade is diverted from a low cost supplier to a high cost supplier, with a subsequent decrease in trade and welfare. The integration of resource base allows the production frontier of the region to be extended in the process of structural transformation, driven by capital formulation in the manufacturing sector. In this way members achieve more than the gains to be derived from greater competition and the exchange of goods in the integrated market.

In developing countries, integration is seen to increase growth through industrialization i.e. structural change in all member countries, while in developed countries integration is more concerned with relative growth performance i.e. for poorer countries to grow more rapidly than the rich countries, in the sense, redistribution through growth. In the developing world, industrial growth is encouraged by the creation of a single market or economic space, surrounded by a common external tariff as in the case of a custom union. It is often argued that one of the principal benefits stemming from custom union formation is that producers are able to lengthen their production runs in effect 'exchange' scale economies. Custom unions allows for economies of scale from exporting to other countries in the larger integrated market. Within the region, information costs, prices and consumer preferences is readily available. Through integration, the artificial barrier of

import tariffs is removed, leaving the natural barrier of transport costs as the main constraint on intra-regional trade. However the cost of transportation within the region is assumed to be lower than the transportation cost to distant industrialized countries. Since trade diversion is the driving force of development–oriented market integration, welfare gains do not increase, but previously unemployed resources are put to use in high-cost industrial production without a loss of output elsewhere; real income grows, even though the resources are used inefficiently. Integration will be advantageous if the benefits associated with output growth outweigh the welfare costs of trade diversion.

A situation may arise that if countries possess no or few industrial products that they could produce at lower costs than the other member or members in the group, this raises the issue of how costs and benefits of regional integration should be equitably distributed among member countries. This is one of the most contentious issues from integration. Customs union theory attempts to address this issue through the estimation of trade creation and trade diversion effects. The Vineran argument that trade diversion was welfare reducing and that trade creation was welfare enhancing (from a welfare point of view) has provided a catalyst for much debate, with weak support being achieved (Gehrels: 1956/57; Lipsey: 1957/60; Meade: 1955; Krauss: 1972). Once trade creating and trade diverting effects are estimated, policies could be implemented to compensate those countries that are forced to bear costs due to integration. These may take the form of subsidies or larger share of the collected customs revenue (in the case of customs union.). The traditional Vinerian custom union theory, which stresses on three-country, two commodity and two factor models, cannot easily accommodate preference diversity,

multiple products and imperfect competition. Ethier and Horn (1984) demonstrate the shortcomings and difficulties of incorporating such market imperfections into custom union theory.

5.3 FORMS OF ECONOMIC INTEGRATION

Four forms of integration can be distinguished as follows: free trade area which eliminates trade barriers between their member countries, customs union which eliminates trade barriers between members but adopts a common external tariff; common market which extends the customs union to freeing the movement of capital and labour between members; and economic unions which aim to coordinate members' economic policies.

5.3.1 REGIONAL GROUPINGS IN SOUTHERN AFRICA

There are five major economic groupings in the Southern and East African region, namely the South African Customs Union (SACU), the Southern African Development Community (SADC), the Common Monetary Area (CMA), the Preferential Trade Area (PTA) which has been replaced by the Common Market for Eastern and Southern Africa (COMESA) and the Cross Boarder Initiative (CBI). The table below shows the country membership of the country regional groupings.

TABLE 5.1

MEMBERSHIP OF REGIONAL GROUPINGS

COUNTRY	Southern African Customs Union (SACU)	Southern African Development Community (SADC)	Preferential Trade Agreement (PTA or COMESA)	Common Monetary Area (CMA)	Cross Border Initiative (CBI)
Angola		*	*		
Botswana	*	*			
Burundi			*		*
Comoros			*		*
Djibouti			*		
Ethiopia			*		
Eiritrea			*		
Kenya			*		*
Lesotho	*	*	*	*	
Madagasacar			*		*
Malawi		*	*		*
Mauritius			*		*
Mozambique		*	*		
Namibia	*	*	*	*	*
Rwanda			*		*
Seychelles			*		*
Somalia			*		
South Africa	*	*		*	
Sudan			*		*
Swaziland	*	*	*	*	*
Tanzania		*	*		*
Uganda			*		
Zaire			*		
Zambia		*	*		*
Zimbabwe		*	*		*

5.3.1.1 SOUTH AFRICAN CUSTOMS UNION (SACU)

Southern African Customs Union (SACU) was originally formed in 1910 between South Africa, Botswana, Lesotho and Swaziland. On reaching independence the so-called BLS (Botswana, Lesotho and Swaziland) states, renegotiated the agreement for implementation in 1969. Namibia joined formally in 1990 when it gained political independence. Until Namibia gained independence in 1990, it was administered by South Africa as part of the customs union. Namibia's membership of the union was formalized in 1990 resulting in a union between South Africa and the smaller four countries, which are now known, as the BLNS (Botswana, Lesotho, Namibia and Swaziland). SACU is the oldest and most integrated grouping in the region. The SACU Agreement allows for duty free movement of goods among member states and establishes a common external tariff. Agricultural goods were however not permitted to move freely between member states as it is quantitatively controlled by the Agricultural Marketing Control Boards in South Africa. Excise duties are harmonized between members and form part of the common external revenue pool. The common revenue pool is administered and controlled by the South African Reserve Bank and distributed to members according to a formula, which enhanced the revenue share going to the smaller countries by 42 per cent (World Bank 1993).

The economies of the members are very closely linked, with goods and labour markets well integrated. In terms of the agreement the smaller countries are permitted to protect new industries for a period of up to eight years, specify strategic industries for assistance

and prohibit the importation of goods for economic, cultural and social reasons. In addition these countries may import goods duty free from outside the customs union, but full duties have to be paid if these goods are re-exported to other member states. Recently, the BLNS countries have been renegotiating the terms of the formula and the decision-making process for setting both trade policy and the distribution of collected import duties since 1994.

5.3.1.2 THE COMMON MONETARY AREA (CMA)

Prior to 1974 a *de facto* union exists between South Africa, Botswana, Lesotho and Swaziland. In 1974 in line with the formation of the South African Customs Union, the monetary union was formalized in an agreement, which recognized the Rand Monetary Area (RMA) between South Africa, Botswana, and Lesotho. In 1976 Botswana established its own central bank currency.

The RMA agreement allowed members to circulate their own currencies with the South African Rand. It also provides the free movement of funds between member states and ready access to the South African money market. The South African Reserve Bank took the responsibility for managing the Rand and the gold and foreign exchange reserves for the union. In 1986 the Trilateral Monetary Agreement (TMA) replaced the Rand Monetary Area with the Common Market Area (CMA). Swaziland introduced its own currency and delinked from the Rand. In terms of the TMA, Swaziland and Lesotho undertook to fully back their issued currency with Rand deposits at the South African Reserve Bank and the Republic of South African Stock (Maasdorp and Whiteside, 1992).

In 1992, the Multilateral Monetary Agreement (MMA) replaced the TMA after Nambia formally joined the CMA. A third bilateral agreement was concluded between South Africa at the same time (Maasdorp and Whiteside, 1993:34).

5.3.1.3 THE SOUTHERN AFRICAN DEVELOPMENT COMMUNITY (SADC)

The Southern African Development Community had its genesis during the apartheid years in South Africa. The original members of the community were Angola, Botswana, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, Zambia and Zimbabwe. Namibia joined as the tenth member after gaining independence in 1990, of the Southern African Development Coordination Conference (SADCC). The objective of the formation of SADCC was to decrease the dependence on South Africa and stimulate regional cooperation in regional projects and balanced regional development (Maasdorp and Whiteside, 1993:35). SADCC began facilitating sectoral and project co-operation in the following areas: transport, agricultural and food security, mining, energy and tourism. In August 1992, in Windhoek, representatives of the ten member states signed a treaty transforming SADCC into the South African Development Community (SADC). The objective of the treaty was to foster deeper economic co-operation and integration. South Africa joined four months after the April elections in 1994. South Africa is very cautious about moves towards trade integration within SADC, because it's belief that trade integration will lead to trade diversion to South Africa (Holden 1996: 7). South Africa has committed itself to the formation of a SADC free trade area (FTA) by signing the Trade Protocol in August 1996. Table 5.2 summarizes the major trade policy reform undertaken in the SADC member countries.

TABLE 5.2

MAJOR TRADE POLICY REFORM IN SADC MEMBER COUNTRIES (1990-1997)

COUNTRY	PERIOD	MAJOR REFORM POLICY
Angola	1994-97	• Increased protection in 1997 • Raising of maximum rate from 100% to 135%
Malawi	1994-98	• Average weighted nominal tariff reduced to 15% • Maximum tariff fell from 45% to 40% (1996), 35% (1997), 30% (1998) • Duties on selected capital and intermediate goods reduced from 10% to 5% in 1998 • All non-tariff barriers removed in June 1997 • Currently 9 bands ranging from 0-30% • All export taxes removed
Mozambique	1990-96	• Import and export licensing largely abolished in 1991 • Tariff structure greatly simplified in 1991 with move from 34 to 5 bands • Range reduced to between 5-35% • Tariffs on imported inputs at 5% • Exemptions significantly reduced in 1995-1996
SACU*	1990-97	• Average nominal tariff fell from 27.5% in 1990 to 7% in 1997 • Conversion from import controls in agricultural to *ad valorem* tariffs • Agricultural control boards eliminated • Import surcharges of up to 40% removed by 1995 • Reduction in number of bands, though still high • Export subsidy eliminated in 1997
Tanzania	1992-98	• Reduction in duties in 1997 • Specific rates converted to *ad valorem* duties in 1993 • Reversal of these policies in 1993-1994 • Harmonization of tariffs between Mainland and Zanzibar • Widespread exemption persist

Zambia	1991-98	• Discretionary import exemptions limited • Dual exchange rate unified • Uplift factor reduced from 25% to 20% in 1992 • Import licensing requirements largely eliminated in 1993 • Overall tariff structure simplified to four bands (5.5, 15, 25) • Uplift factor eliminated in 1995 • Exemption for government imports eliminated in 1996 • Exemption for investors limited to grand fathering • Temporary 5% import declaration fee (IDF) eliminated in mid-1998 • Both dispersion and level of tariffs reduced considerably
Zimbabwe	1992-97	• Foreign exchange allocation and OGIL system abolished in 1994 • Import negative list narrowed to include only health and security related items; textile and clothing removed in 1996 • Import surtax reduced to 15 (1/94) and 10 (8/94) • New tariff regime introduced, with some streamlining of structure (1997)

Source: Various IMF and World Bank country reports.
SACU*: (South Africa, Botswana, Namibia, Lesotho and Swaziland) apply a common external tariff.

5.3.1.4 COMMON MARKET FOR EASTERN AND SOUTHERN AFRICA (COMESA) AND PREFERENTIAL TRADE AREA FOR EASTERN AND SOUTHERN AFRICA (PTA)

In 1983, The Preferential Trade Area for Eastern and Southern African States (PTA) came into existence. In a PTA, tariffs are lowered among member states on certain selected commodities, but there is not yet free movement of goods and services within the area. At present there are currently 23 members, namely all the SADC countries, except Botswana and South Africa, plus Burundi, Comoros, Djibouti, Ethiopia, Eiritrea, Kenya, Madagascar, Rwanda, Seychelles, Somalia, Sudan, Uganda and Zaire (Holden, 1996:7)

The PTA's objective is to provide a continental common market. The PTA plans to eliminate all tariff barriers on intra-PTA trade by the year 2000, its purpose is to promote deeper integration arrangements, with eventually promoting free trade and market status for all its members. However the PTA's objective of decreasing tariffs and non-tariff barriers are limited. The major reason behind this type of trade reform is that members have to find other avenues or sources of revenue when tariffs are reduced.

In December 1994, a new treaty signed by twenty members, replacing the PTA with the Common Market for Eastern and Southern African (COMESA) came into being. Djibouti, Seychelles and Somalia have yet to sign (Holden 1996: 7). The members seek to establish a common external tariff. It also aims to promote co-operation in sectors such as transport, communications, agriculture and industry. The conflict between the membership of SACU and COMESA is evident in that South Africa and Botswana did not join the larger trade groupings. Due to their membership in SACU, Lesotho, Swaziland and Namibia have been unable to engage in any tariff cutting within the PTA. However dual membership is not tenable.

The PTA Clearing House established in 1984 was to address the question of non-convertible currencies and the shortage of foreign exchange to pay for imports. In 1986 the PTA established the PTA Bank for Trade and Development to provide short term trade and development finance for members. In 1988 the PTA introduced checks denominated in PTA Units account (UAPTA) to help with the conversion of hard

currency. Lastly in 1990 a monetary harmonization program has been adopted to achieve a monetary union by 2020.

There has been increasing conflict between SADC and COMESA as their objective has converged. In 1994, countries with dual membership alleged to withdraw from COMESA, a decision that was to be finalized in 1996 (Holden, 1996:7). South Africa's decision to join SADC rather than COMESA, and the signing of the SADC Trade Protocol, appear to be the main reasons for the consolidation of SADC.

5.3.1.5 THE CROSS BORDER INITIATIVE (CBI)

The Cross Border Initiative (CBI) is a new move towards promoting trade liberalization, cross-border trade, investment and payments in East and Southern Africa and the Indian Ocean. The CBI emerged out of the Maastricht Conference on Africa in 1990 and is sponsored by the World Bank, International Monetary Fund, The European Union and the African Development Bank. The following fourteen are the members of the CBI: Burundi, Comoros, Kenya, Madagascar, Malawi, Mauritius, Namibia, Rwanda, Seychelles, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe. Both Namibia and Swaziland are also members of SACU. At present, South Africa has not indicated an interest to join the grouping. Specifically members are expected to converge towards a moderate external tariff and to reduce internal tariffs and non-tariff barriers significantly. Those countries that have undertaken significance reforms, namely Uganda, Malawi, Zambia, Mauritius and Zimbabwe will have little difficulty to conform (Holden, 1996: 9). The rest of the members, including Namibia and Swaziland, are presently concerned

about revenue effects of such large decreases in tariff rates. It is also clear that where multilateral trade liberalization has occurred regional liberalization is less likely to incur the costs of trade diversion.

5.3.1.6 OTHER TRADE AGREEMENTS IN SOUTH AFRICA

Several bilateral trading agreements exist between South Africa and other SADC countries. Specifically, arrangements exist between Zimbabwe (confined to clothing and textiles), Malawi and Namibia respectively.

The agreement with Zimbabwe has been in force since 1964. The agreement is very complicated and it has been difficult to assess the real impact of the agreement on Zimbabwe imports into South Africa. It has been estimated that the level of preference given by Zimbabwe to South African exporters ranges between 2.5 per cent and 20 per cent. Whereas, South Africa grants preferential access to Zimbabwean goods amounts to 25 per cent and 30 per cent (African Development Bank, 1994, p23).

In other agreements South Africa grants unilateral tariff concessions on some imports From Mozambique and Turkey. The local content requirement is 35 percent, and goods range from fish and other seafood, cashew nuts and citrus fruit, through to textiles, wooden furniture, tyres and tubes (GATT, 1993: 50). The agreement reduces South African tariffs on imports from Mozambique to 3 per cent on a certain range of goods subject to quotas. The goods that qualify for preferential access can only be consumed in

South Africa or Botswana. South Africa is not given any tariff concession by Mozambique.

The agreement with Turkey is very much similar. A hand full of goods were admitted duty free if the most favoured nation (MFN) rate is 3 per cent or less, or a ceiling rate of 3 per cent is the MFN rate was more than 3 per cent. The Turkish imports had to contain at least 50 per cent local content. The Turkish agreement ended in 1993.

The Malawi agreement was concluded in 1990, this agreement provides for duty free access into South Africa of Malawian imports with a local content of at least 25 per cent (GATT, 1993, p50), except for the following; certain agricultural products and coffee, tea and sugar that require an import permit. In 1991 trade agreements existed between Hungry, Poland, Romania and Czechoslovakia that exempted imports from these countries from the import surcharges. This exemption represented a considerable margin of preference as the surcharge ranged as high as 40 per cent on certain luxury imports. However in 1995 the South African government abolished the import surcharge on all imports decreasing the competitive edge granted under these agreements.

South Africa is the founding member of SACU and has joined SADC. Whether South Africa will join either the PTA or the CBI is still open to debate. If South Africa is included in any regional grouping in Southern Africa it is the dominant partner in many respects. This is depicted in table 5.3.

TABLE 5.3

CHARACTERISTICS OF SOUTHERN AFRICAN COUNTRIES AND REGIONAL GROUPINGS FOR 1993

	Area (m KM2)	Population (m)	Total GNP US $m	GNP per Capita
Angola	1.25	9.5	9175	650
Botswana	0.58	1.3	3289	2530
Kenya	0.6	25.4	6743	270
Lesotho	0.03	1.8	1044	580
Malawi	0.12	8.8	2024	230
Mozambique	0.8	16.1	1288	80
Namibia	0.82	1.5	2190	1460
Swaziland	0.02	0.8	840	1050
Tanzania	0.95	25.2	3486	420
Uganda	0.2	18	3486	190
Zambia	0.75	8.3	3486	420
Zimbabwe	0.39	10.1	6565	650
SADC (ex SA)	5.71	83.4	29421	350
PTA	11.0	239	58486	245
SACU (ex SA)	1.92	5.4	7373	1364
SACU	3.14	44.3	106947	2414
CBI	4.49	125.95	38485	1167
South Africa	1.22	38.9	99584	2560
SA % PTA	11.1	16.3	170.3	1044.9
SA % SADC	21.4	46.6	438.4	731.4
SA % SACU	38.9	87.8	93.1	106.0
SA% SACU (Ex SA)	63.5	720.4	1352.5	187.7
SA % CBI	27.2	30.9	258.8	219.4

Source: the World Bank Atlas, 1995, Maxwell Stamp, 1995

Table 5.3 shows South African GNP in 1993 was more than 4 times greater than SADC aggregate GNP. It was 2 and half times greater than the CBI total GNP, and 1 and half times greater than total GNP in the PTA. South African GNP *per capita* is twice the size of *per capita* GNP in the CBI, ten times more than the PTA *per capita* income and seven times greater than *per capita* GNP in SADC countries.

5.4 INTRA-INDUSTRY TRADE AND ECONOMIC INTEGRATION

Viner (1950), Meade (1955, Lipsey (1957,1960) and the Cooper-Massell (1965) theories of integration, suggest that trade integration will lead to inter-industry specialization among member countries. However, early empirical evidence of the Western European integration (Verdoorn: 1960; Balassa: 1966; Grubel: 1967) found a marked expansion of trade within industries or product groups, implying that a large amount of intra-industry specialization. According to Robson (1987: 42), the inability of orthodox customs theory to incorporate the existence of intra-industry trade arise from the assumption of homogenous goods, which precludes a country from exporting and importing the same good. But however in Brander and Krugman's (1983) reciprocal dumping model, oligopolistis rivalry between firms allows for the possibility of intra-industry trade in homogenous goods. Intra-industry trade in homogenous goods can arise from border trade related to low transport costs, or may be due to seasonality or entrepôt trade (Winters 1991: 62). However, these factors alone cannot explain the recorded levels of intra-industry. Relaxation of the Robson (1987: 42) assumption of orthodox customs union theory and, enabling the recognition of product differentiation and consumer demand for variety, together with the incorporation of scale economies, allowing for the prospect of intra-industry trade. According to Krugman (1982: 197-198), this creates the possibility for reciprocal tariff reductions to lead to increased sales within an industry by producers in both the countries, so that a particular country may expand both its exports and imports in a specific industry, which in turn make trade liberalization 'relatively easy to achieve'.

5.5 TRADE LIBERALIZATION AND INTRA-INDUSTRY TRADE

One of the important features of an integration agreement is the liberalization of tariff barriers among the integrating economies and (in the case of custom union) the erection of a common external tariff against outside countries. It is often argued that trade liberalization is more than likely to promote intra-industry trade on the notion that trade liberalization promotes trade expansion in general. Greenaway (1989: 32) argues that there is no *a priori* reason why trade liberalization should specifically stimulate the growth of intra-industry trade rather than inter-industry trade, unless it is argued that custom union formation should result in a reduction of tariff and non-tariff barriers, as a result trade liberalization will be more extensive. In order to find out whether economic integration may stimulate intra-industry trade more than inter-industry trade, Greenaway (1989: 32) argues that pre-union market structures need to be considered more carefully.

5.6 THE DEMAND AND SUPPLY SIDE OF INTRA-INDUSTRY TRADE

A number of features of both demand structure and production structure have been identified in economic literature as possible sources or determinants of intra-industry trade. This is because the presence of such economic characteristics of potential member countries in a regional arrangement could suggest that trade liberalization can lead to increased intra-industry trade or specialization which could have positive implications for trade policy and welfare.

5.6.1 THE DEMAND SIDE OF INTRA-INDUSTRY TRADE

On the demand side, preference diversity or the demand for varieties and overlapping demand conditions have emerged as important sources or determinants of intra-industry trade. Other things being equal, the more evenly preferences are distributed along a given product spectrum or product category, the greater the potential for intra-industry trade. This applies to both the horizontal product spectrum as well as the vertical product spectrum. The horizontal product spectrum is defined as the diverse preferences for the alternative combinations of a given set of attributes, while the vertical product spectrum is defined as the diverse preferences for alternative quality grading. The usual notion is that product differentiation is usually horizontal (Behar, 1991: 535-536), in which case the greater the demand for varieties if income levels are high, suggesting the potential for intra-industry trade will be higher among high-income countries (Havrylyshyn and Civan, 1983: 119; Robson, 1987: 42). Lancaster (1980) and Greenaway (1982) have shown that the extent of any taste overlap between potential members is relevant. The greater the trade-overlap of tastes and preferences, the greater the scope for intra-industry specialization. The Linder (1961) hypothesis suggests that the countries with similar *per capita* income levels can be expected to have similar tastes or preference structures, and hence larger 'overlapping demands', implying greater scope for intra-industry trade (Winters, 1991: 67; Carbaugh, 1995: 84).

According to Greenaway (1989: 32), if the pre-regional integration economies have similar preferences structures, and produce similar, but differentiated products a greater stimulus will be given to intra-industry exchange. Greenaway (1989) argues that if it is

predominately countries with similar factor endowments, similar *per capita* income and similar demand structures, which form custom unions, this will be an important basis for intra-industry specialization. However, where product differentiation is defined by differences in quality, the demand for a variety of products (across the vertical spectrum) has been associated with unequal income levels (Falvey and Kierzkowski, 1987: 144, 158; Lancaster, 1979: 221). This type of product differentiation is likely to be of interest in considering the potential scope for intra-industry trade among countries at unequal levels of development. According to Balassa (1979; 261), in the case of vertical product differentiation, the attributes of varieties traded will reflect the factor endowments of the country concerned, so that, the less developed country may export the lower-quality varieties, using mainly unskilled labour to more developed countries, in return for higher-quality varieties. Therefore, on the demand side intra-industry trade is likely to be most prevalent among countries with high and similar *per capita* income levels, capturing both trade overlap diversity of preferences.

5.6.2 THE SUPPLY SIDE OF INTRA-INDUSTRY TRADE

Intra-industry trade involves the exchange of goods with similar factor requirements, unlike the inter-industry trade based on comparative advantage predicted by the Heckscher-Ohlin theorem, which involves the exchange of goods with different factor endowments (Havrylyshyn and Civan, 1983:113). It is therefore, likely that countries with very similar factor endowments will engage in intra-industry trade, while countries with very different factor endowments will engage in inter-industry trade (Krugman, 1981: 964). Because a large proportion of intra-industry trade takes place between

countries with similar factor endowments, producing similar but differentiated products, diversity on the supply side is an important aspect. Havrylyshyn and Civan (1983: 119) note that the more 'sophisticated' and 'advanced' the industrial sector of the economy, the greater will be its ability to produce a wide range of diverse and probably heterogeneous products. While the authors acknowledge that product diversity is not necessarily the same as product differentiation, Havrylyshyn and Civan (1983: 121) assume product diversity is a 'precondition condition for heterogeneity or at least that economies which have reached the level of advancement in which differentiated demand and supply exist must have also attained a large degree of diversity in production'.

Krugman (1982: 198) defines an 'industry' as a group of products which are all produced with the similar factor intensities. The pattern of inter-industry specialization, and, therefore whether a country is net exporter or importer in a particular industry, thus depends on the conventional notion of comparative advantage. However because of scale economies in production, each country specializes in a limited subset of varieties within each industry (intra-industry specialization). The resulting intra-industry trade implies that countries, which are net exporters, will be gross importers in a particular industry, because foreigners are producing differentiated goods (Krugman, 1982: 197-198).

Grimwade (1989: 134-135) argues, therefore that it is not production *per se* which gives rise to intra-industry trade. If average costs increase with output, it would pay producers to manufacture the whole set of varieties demanded by the consumer. It is the presence of decreasing costs, which makes it unprofitable for producers to produce all the possible

combinations of varieties of a product. Falvey (1981) and Falvey and Kierzkwoski (1987) show that product differentiation can be consistent with the assumption of constant returns to scale, provided the former is defined in terms of product quality (vertical product differentiation). It can be expected that the existence of a demand for varieties or combination of varieties and overlapping demands, together with decreasing costs, will result in intra-industry specialization (Krugman: 1979; Greenaway: 1989). Grinwade (1989: 34) notes that a number of empirical studies (Caves: 1981; Balassa, 1986) have found a negative relationship between economies of scale and the level of intra-industry trade. He argues, however that the type of economies of scale used in these studies is the economies of large plant size, proxied, for example by minimum efficient scale (MES). Economies of scale which leads to intra-industry trade is associated with long production runs, which may be achieved in comparatively small but specialized plants. Significant levels of intra-industry trade can be expected in industries where significant cost savings result from longer production runs.

A few features of the structure of demand and the structure of production are summarized as follows:

'The existence of similar and therefore competitive, as opposed to complementary, production structures is clearly a necessary condition for intra-industry specialization to arise. If there is some similarity of demand conditions among members, reflected in overlapping tastes, and if goods are produced with economies of scale, so limiting the amount of product diversity that domestic producers can accommodate profitably, there will be an incentive for horizontal specialization within industries in order to benefit from the economies of large-scale production' Robson (1987: 42).

5.7 WELFARE EFFECTS OF INTRA-INDUSTRY TRADE

An extensive literature has emerged since the mid-1970 in order to develop a theoretical explanation for intra-industry (Dixit and Norman: 1980; Lancaster: 1980; Falvey: 1981; Helpman: 1981; Krugman: 1979, 1980, 1981, 1982; Brander and Krugman: 1983; Helpman and Krugman: 1985). The welfare gains from intra-industry trade considered, firstly, in terms of gains from trade in differentiated goods and, secondly, in terms of implication of intra-industry specialization for the costs of adjustment to trade liberalization.

According to Gray (1973:27), the gains from trade in differentiated products 'are to be found in wider choice offered to consumers in the different nations, in the possibility of an exchange of scale economies among nations, and perhaps the most important of all, in the exposure to foreign competition of domestic industries'. The gains from intra-industry trade arising from greater choice of variety of products and the exchange of scale economies have been highlighted by Krugman (1979,1981) and Greenaway (1982). Greenaway (1982:51) argues that the X-efficiency gains emphasized by Gray (1973:27) may particularly follow increasing intra-industry exchange when autarkic or protected markets are oligopolistic or monopolistic.

It has been argued that the costs of adjustment to trade liberalization are likely to be less if tariff reductions lead to intra-industry trade rather than inter-industry trade (Balassa: 1979: 267; Krugman: 1981, 1982; Greenaway: 1982: 52; Behar: 1991: 532-533). Behar argues (1991: 533), that although intra-industry specialization may be efficient in the long

run, 'it necessarily produces serious dislocation in both production and employment in the short run'.

The adjustment consequences would be less disruptive with intra-industry trade than inter-industry trade. This line of thinking can be viewed in two ways. Firstly, it can be argued that, in the case of goods which are good substitutes in production, it will be easier for firms to switch between the production of close varieties than reallocate resources across industries (Willmore: 1979:201; Caves: 1981:204; Behar: 1991:533). Caves (1981:204) suggests that 'the growth of intra-industry trade is attractive as a process of adjustment, because production can become more efficient without a high concurrent cost of transferring factors of production to different locations and lines of work'. Secondly, the distribution effects of trade liberalization may not be so costly under intra-industry specialization. The Stopler-Samuelson theorem predicts that, in the case of inter-industry trade in the conventional Hecksher-Ohlin theorem, the abundant factor gains while the scarce factor losses absolutely (Stopler and Samuelson, 1941). But however, in the Krugman (1981, 1982) models show that in the presence of increasing returns, with products that are close but not perfect substitutes, both productive factors will gain from trade.

In Krugman's (1982) model of international trade, two-way trade in the context of monopolistic competition, the pattern of inter-industrial specialization is determined by factor proportions, in the sense that the model incorporates an element of comparative advantage. The presence of economies of scale and differentiated products ensures that

there is also intra-industry trade, which is independent of comparative advantage. The concept of trade liberalization allows both countries to expand their exports and imports within an industry. The products or commodities produced in each industry or product group in Krugman's (1982) model are produced with industry–specific labour, and each country has a different endowment of sector-specific labour supplies. A country's net export position in a given industry (that is, whether it has an overall comparative advantage or disadvantage in that industry) will depend on its relative endowment of industry specific factor. But however, a country will still import even when it has a comparative advantage, and will still export when it has a comparative disadvantage. The importance of intra-industry trade within a sector depends on the degree of product differentiation with that industry and the strength of comparative advantage (Krugman, 1982: 203-204)

Krugman (1982: 203-204) argues that producers in both countries will oppose any unilateral liberalization, since foreign competition will lower the return to the industry-specific factor, usually without a compensating consumption gain. However, reciprocal tariff reductions will not only benefit producers in the country with a comparative advantage, but can also raise the welfare of producers in the country with a comparative disadvantage. Because different countries produce goods, which are imperfect substitutes for one another, the removal of trade barriers will offer consumers a wide choice. If this induces them to spend a larger share of their income on a particular industry's products then, if products are sufficiently differentiated and comparative is relatively weak, the

return to that industry's specific factor may increase in the country with a comparative disadvantage.

Krugman (1982: 206-207) concludes that in sectors where comparative advantage is strong and product differentiation is weak, manufacturers in both countries with a comparative disadvantage stand to lose from trade liberalization. On the other hand, manufacturers in both countries will gain from mutual or bilateral trade liberalization in an industry if neither country has too bigger a comparative advantage and if products are strongly differentiated within that industry, since it is possible for both factors of production to gain from trade. This suggests that the adjustment to trade liberalization is more than likely to be painless when the potential trade is of intra-industry trade rather than inter-industry trade. This is more likely to happen if both countries have similar factor endowments. A detailed presentation of Krugman's (1982) model is presented in chapter six.

The theoretical predictions of Krugman (1981, 1982) find some support in Brown *et al.'s* (1992) empirical analysis of NAFTA. According to Brown *et al.* (1992:14), 'the expected realization of economies of scale due to a more competitive environment within the NAFTA could potentially raise the real return to both capital and labour in all countries'. This can be illustrated with reference to profit-maximizing condition for employment of factors of production, that is, a firm will employ each factor of production up to a point where the return is equal to its marginal revenue product. For an imperfectly competitive firm this is given by:

$$r_i = MR \text{ X } MP_i = P\left(1 - 1/\varepsilon\right) \text{ x } MP_i$$

Where r_i is the return to factor *i*, MR is the marginal revenue, MP_i is the marginal physical product of factor *i, and* $\varepsilon > 0$, is the firm's perceived elasticity of demand (Brown *et al.* (1992:14). Trade liberalization will lower the return of the scarce factor of production by decreasing its marginal product. However, if it also leads each firm to perceive a more elastic demand curve, then the real return to each factor of production (measured by r_i/P) may rise, even though factor *i's* marginal product decreases. As in the case of increasing returns to scale, as firms move down their average cost curves, the average product of both factors of production may increase, and although the relative return to one factor could decrease, both factors may gain in absolute terms (Brown *et al.* (1992:14). It follows thus, the welfare gains from intra-industry trade lie not only in the gains from trade in differentiated products, but lower adjustment costs to trade expansion of intra-industry trade. In contrast to the traditional outcome, there may be what Simpson (1987: 136) calls ' an extra gain from trade', since it is possible for both productive factors in a country to benefit from the removal of trade barriers.

5.8 INTRA-INDUSTRY TRADE WITHIN A REGIONAL CONTEXT

Krugman's (1982) analysis, suggests that producers in both countries will favour reciprocal trade liberalization over unilateral trade liberalization in industries in which manufactured products are differentiated. Such reciprocal reduction in tariff could take place in either in a multilateral framework or in context of the formation of a regional integration agreement. A number of studies focused on the relationship between

economic integration and intra-industry trade. According to Greenaway (1991: 167) such empirical studies have found a tendency for intra-industry trade to be larger in countries involved in integration arrangements, whether developing or developed (Willmore: 1974; Balassa: 1979; Havrylyshyn and Civan 1983: Balassa and Bauwens: 1987), although there is not much theoretical underpinning of regional intra-industry trade. Greenaway (1989: 33) identifies a number of possible causal relations between regional integration and intra-industry. Most of the integration effects are tested using dummy variables, in most cases, turns out to be statistically significant (Greenaway 1989: 35-36). The table 5.4 provides a summary of the results.

TABLE 5.4

EMPIRICAL EVIDENCE ON INTRA-INDUSTRY TRADE AND ECONOMIC INTEGRATION

Study	Regional trading arrangements	Year	Estimation Procedure	Result
Balassa (1979)	LAFTA CACM	1974-5	DV/OLS	+(*) +(*)
Havrylyshyn and Civan (1983)	EC LAFTA CACM	1978	DV/OLS	+(*) – +(***)
Balassa (1986)	EC EFTA LAFTA	1973		+ +(**) +(**)
Balassa and Bauwens (1987)	EC EFTA LAFTA	1971	DV/LOGIT	+(*) +(*) +(*)
Andersson (1987)	EC EFTA NORDIC	1965 1973 1980	DV/LISREL	+ + +
Balassa and Bauwens (1988)	EC EFTA LAFTA	1971	DV/TOBIT	+(*) +(*) +(*)
Aiginger and Breuss (1998)	EC EFTA	1985	DV/OLS	+(*)

Source: Greenaway (1989)

Notes: DV= Dummy variable
* = Significant at 1%
** = Significant at 5%
*** = Significant at 10%

Greenaway (1989: 33) argues that if member countries in a regional union have similar preference structures before integration, and produce similar, but somewhat differentiated goods, 'a greater stimulus will be given to intra-industry exchange than would be case in multilateral liberalization'. The presence of similar factor endowments, similar *per capita* incomes and similar demand structures between member countries in an integration arrangement will provide an important basis for the expansion of intra-

industry trade, as observed in the European Community (EC). If access to a larger protected market through integration allows manufacturers to increase the production run and effectively 'exchange' economies of scale, then the existence of demand for variety and overlapping demands together with decreasing costs may give rise to a greater degree of intra-industry specialization. A causal link between economic integration and intra-industry trade, considered by Greenaway (1989: 33-34), is primarily relevant to the analysis of common markets, and relates to the possible concomitant relaxation of controls on factor mobility in a regional union. If economic integration is accompanied by liberalization of capital flows, foreign direct investment may result in intra-firm trade, which is recorded as intra-industry trade. In this light, factor movements and intra-industry trade are considered to complementary, with intra-industry emerging as a result of activities of multinational corporation in the international market (Agmon: 1979: 50).

The insights into possible integration effects have been approached from two avenues, firstly by examining intra-bloc intra-industry trade to total intra-industry trade. Some evidence is provided by Balassa (1966), Willmore (1974), Grubel and Lloyd (1975) and Drabek and Greenaway (1984). This suggests that intra-bloc intra-industry trade grew more quickly than intra-industry trade in general. Secondly, by comparing the experience of countries, which are not subject to such arrangements. Grubel and Lloyd (1975) and Drabek and Greenaway (1984) found support for a more rapid growth on intra-industry trade in countries party to an integration arrangement than in comparable countries.

Balassa (1979) study of intra-industry trade in Latin America, reported that for most part, the degree of intra-industry specialization in the Latin America Free Trade Association (LAFTA) countries is greater with LAFTA partners than with other developing countries. Intra-industry trade is found to be greater than average in electrical machinery and equipment, non-electrical machinery, and chemicals, industries in which there are large number of complementary agreements. Intra-industry trade within the Central American Common Market (CACM) is also found to be greater than between the CACM countries and other developed or developing countries, and is greatest in textiles and clothing, fabricated metal products, and miscellaneous manufactured goods, followed by paper products. Balassa (1979: 255) argues that the extent to which the CACM, whose members are at lower levels of development than the LAFTA countries included in the study, shows a higher degree of intra-industry specialization than LAFTA reflects the more extensive liberalization of intra-regional trade which has taken place in the CACM, involving the elimination of tariffs on nearly all intra-bloc trade in manufactures.

On contrary to the studies of Willmore (1974, 1979) and Balassa (1979), Havrylyshyn and Civan (1983: 127-128) find that the Latin American integration schemes do not appear to have significant impact on intra-industry trade. The authors argue that the most important reason for these contradictory results is that the dependent variable in their study is the level of global intra-industry trade, rather than bilateral intra-industry trade, as in the case of other studies. Although trade integration may increase the degree of intra-bloc intra-industry trade, if the integration scheme is essentially trade diverting this will be offset by a reduction in extra-bloc intra-industry trade. Havrylyshyn and Civan

(1983: 119) therefore argue that the net effect of economic integration on intra-industry trade will depend on whether trade creation or trade diversion predominates. While membership of a 'successful' integration arrangement, defined as one which results primarily in trade creation, such as the European Community (EC), will tend to raise intra-industry trade, integration arrangements which result in significant trade diversion, such as those in Latin America, are likely to have little net effect on intra-industry trade, and lower it. Balassa (1979), notes that since the tariff reductions in LAFTA were undertaken on a preferential basis, they tended to be trade diverting. However, he argues that the more complete removal of tariffs on intra-CACM trade in manufactures will lead to trade creation, which provided a comparatively greater stimulus to intra-industry specialization.

Behar (1991: 532) notes, 'intra-industry trade may be stimulated by economic integration, but this effect is mediated by factors such as preference diversity and overlapping demand conditions, decreasing costs in production and intra-firm trade, oligopolistic competition and product differentiation'. Balassa (1979) contends the prospect for increased intra-industry specialization are likely to be high among countries with high and similar *per capita* income, Balassa (1979; 258), argues that countries with relatively low but similar *per capita* income levels have much to gain from intra-industry trade in the context of a regional union, because industrialization will occur in the framework of a larger market, allowing for increased specialization. The lower cost of adjustment of intra-industry specialization, in contrast to high adjustment costs of inter-industry specialization, provides an argument for trade integration between these countries

(Balassa: 1979: 266). While integration will be more difficult between countries at different levels of development, especially when the more advanced member countries of the group have industrialized behind high tariff barriers, Balassa (1979: 266-267) argues that there is nevertheless potential for reaping benefits from horizontal and vertical specialization in a regional union among unequal partners.

Hufbauer and Chilas (1974) showed that intra-industry trade is much more important when considering different countries (United Kingdom, France, West Germany, the rest of Western Europe, Canada, United States, Japan) than when considering the four major regions of the United States. The findings confirmed the authors' belief that the structure of the tariffs is the main source of intra-industry trade. The authors argued that the tariff reductions implemented in last two decades mainly consisted of reciprocal concessions industry-by-industry and favoured intra-industry trade over inter-industry trade.

5.9 SOUTH AFRICA'S AND SACU'S TRADE WITH THE REGIONS

This section examines South Africa's and SACU's trade within the Southern African region.

5.9.1 SOUTH AFRICAN EXPORTS AND IMPORTS TO AND FROM COUNTRIES IN THE SOUTHERN AFRICAN REGION

Since the start of 1989 South African exports to SADC countries as proportion of total trade increased from 7.4 per cent to 9.9 per cent (Table 5.5) indicating that SADC countries were becoming more open and receptive to South African exports. Imports into South Africa grew from 1.4 per cent in 1989 to 2.36 percent in 1992 (Table 5.6). However, imports decreased to 1.75 per cent in 1993. Although SADC assumed a more

important role in terms of both purchasing and selling of goods, nevertheless it still accounts for a small proportion of total trade.

TABLE 5.5

SOUTH AFRICA'S EXPORTS TO SADC (R MILLION)

COUNTRY	1989	1990	1991	1992	1993
ANGOLA	18.8	53.2	137.8	368.7	262.4
BOTSWANA	0.1	0.04	0.5	1.3	0.5
LESOTHO	0.2	0.01	0.04	0.7	0.002
MALAWI	434.9	419.2	576.5	695.5	591.7
MOZAMBIQUE	371.9	4362.9	689.3	676.7	961.6
NAMIBIA	0.04	0	0.01	0.3	0.06
SWAZILAND	2.1	0.1	0.1	2.4	0.2
TANZANIA	3.0	11.1	10.0	25.7	57.7
ZAMBIA	446.3	530.4	663.4	1111.7	1305.9
ZIMBABWE	991.5	1158.7	1600.7	1548.7	1745.2
TOTAL SADC	2286.66	2635.7	3678.44	4431.7	4925.28
TOTAL RSA	30830.5	32445.8	36849.3	42425.3	49517.1
SADC % RSA	7.4	8.1	10.0	10.4	9.9

Source: IDC (1990)

TABLE 5.6

SOUTH AFRICA'S IMPORTS FROM SADC 1989-1993 (R MILLION)

COUNTRY	1989	1990	1991	1992	1993
ANGOLA	9.9	0.06	0.02	0.5	1.1
BOTSWANA	6.6	13.9	1.8	5.7	5.7
LESOTHO	0.3	0.2	0.3	0.06	0.02
MALAWI	58.5	81.0	91.0	131.5	159.5
MOZAMBIQUE	17.5	30.4	37.4	47.4	60.3
NAMIBIA	0.07	0.6	0.7	0.59	0.5
SWAZILAND	0.2	0.06	0.4	0.9	1.3
TANZANIA	1.6	2.5	0.95	10.3	21.8
ZAMBIA	5.7	6.3	14.5	40.5	75.5
ZIMBABWE	457.4	440.7	471.6	810.6	659
TOTAL SADC	557.77	575.72	618.67	1048.05	984.7
TOTAL RSA	38682.7	38013.4	42054	46319.6	56124.8
SADC % RSA	1.4	1.5	1.47	2.36	1.75

Source: IDC (1990)

5.9.2 SOUTH AFRICAN EXPORTS AND IMPORTS TO AND FROM COUNTRIES IN THE PREFERENTIAL TRADING AREA (PTA)

Exports to the Preferential Trade Area as a proportion of total South African exports have grown largely as a result of the growth in exports to those members of the PTA, which are also members of SADC. The proportion of exports accounted for to the other members remains low at approximately 2.5 per cent (Holden: 1996). Imports to the PTA have grown very slowly from 1.6 per cent in 1989 to 2.3 percent in 1993. Despite the increase in trade that occurred between South Africa and Southern Africa, SADC and PTA countries remain relatively unimportant trading partners. Although Zimbabwe is an

exception, the trading blocks of the Southern African region only accounts for small proportions of South African total trade.

5.9.2.1.1 THE COMPOSITION OF SADC/PTA TRADE WITH SOUTHERN AFRICA

The balance of merchandise trade with both SADC and PTA countries have always been in favour of South Africa in the sense that South Africa exports have exceeded imports from these countries. Table 5.7 shows merchandise trade balance of the regional groupings with South Africa.

TABLE 5.7

MERCHANDISE TRADE BALANCE OF REGIONAL GROUPINGS.

GROUPING	1989	1990	1991	1992	1993
PTA	1811	2060	3060	3383	3940
SADC	2391	2968	3871	4350	4856

Source: IDC (1990)

Besides Zimbabwe, most of South Africa's trade takes place between OECD countries and an increasing extent with East Asian countries. Trade with Africa on the other hand, while comprising a small proportion of South Africa's trade, is centered on the exchange of natural resource products from Southern Africa for a range of other commodities, examples are processed foods, beverages, fertilizers, explosives, chemicals, plastics, footwear, motor vehicle and their parts. However, there is a small proportion of unrecorded or unofficial trade within Southern African total trade. Maasdorp calculates in 1990, the amount of unofficial trade on part of Zimbabwean day shoppers into South Africa amounted to 15 per cent of Zimbabwe's imports into South Africa.

5.9.3 SACU'S EXPORTS AND IMPORTS WITH THE REST OF THE WORLD AND SADC

This section examines SACU's trade with the rest of the world.

5.9.3.1 SACU'S EXPORT TO REST OF THE WORLD

The composition of SACU's trade with rest of the world and to SADC differs significantly. Table 5.8 shows that in 1995, iron and steel contributed the largest proportion (22.1 per cent) and pottery contributed the smallest proportion (0.04 per cent). However SACU's manufactured export to SADC in 1995 was chemicals (26,3 per cent). Iron and steel and non-ferrous metals which feature so prominently in SACU's export to the rest of the world, comprise much smaller percentages of SACU's manufactured exports to SADC (12.2 and 1.8 per cent respectively). This is probably because of the significance of these sectors in Zimbabwe's industrial sector.

TABLE 5.8

COMPOSITION Of SACU'S TOTAL MANUFACTURED EXPORTS TO ROW AND SACU'S EXPORTS TO SADC

	TOTAL EXCLUDING SADC (ROW)					SADC				
SECTOR	**1988**	**1990**	**1992**	**1994**	**1995**	**1988**	**1990**	**1992**	**1994**	**1995**
Food	7.29	8.01	7.15	7.00	5.33	5.76	8.20	10.35	9.19	8.53
Beverages	0.42	0.62	0.92	1.98	1.53	1.66	3.45	4.36	4.23	2.60
Tabacco	0.04	0.04	0.16	0.11	0.10	0.02	0.04	0.44	0.51	0.62
Textiles	5.23	4.24	4.10	3.20	2.83	4.96	6.28	3.91	3.56	2.33
Clothing	0.51	0.67	1.45	1.03	0.82	0.64	0.73	1.01	0.33	0.55
Leather	0.63	0.91	0.94	1.72	1.35	0.08	0.09	0.09	0.05	0.07
Footwear	0.08	0.07	0.15	0.22	0.15	0.17	0.19	0.20	0.23	0.21
Wood	1.00	1.22	0.90	1.15	0.62	0.38	0.36	0.47	1.04	0.93
Furniture	0.61	0.59	0.77	0.72	0.78	0.38	0.72	1.05	1.18	0.86
Paper	9.30	8.42	7.42	7.16	9.87	5.07	4.31	3.29	7.04	3.03
Printing/publishing	0.15	0.17	0.11	0.24	0.22	0.51	0.53	0.50	1.73	0.95
Chemicals	12.40	9.84	14.20	16.66	17.87	22.29	21.51	19.29	18.88	26.32
Rubber	0.28	0.19	0.29	0.42	0.53	1.82	1.59	1.73	2.01	1.74
Plastics	0.23	0.28	0.39	0.51	0.56	1.66	1.44	1.44	2.16	1.51
Pottery etc	0.02	0.02	0.04	0.03	0.04	0.20	0.27	0.26	0.25	0.16
Glass	0.58	0.61	0.53	0.39	0.23	1.29	0.91	0.72	0.76	0.52
Other non-metallic	0.26	0.57	0.79	0.96	0.94	1.37	1.68	1.62	1.68	1.08
Iron and steel	30.90	32.22	27.39	27.29	22.07	10.30	9.25	6.91	7.44	12.18
Non-ferrous	18.23	15.37	15.66	8.32	14.06	13.33	6.58	4.24	2.35	1.82
Metal products	3.74	5.20	3.21	4.90	5.63	6.02	7.06	6.36	5.61	4.99
Machinery	4.04	3.92	4.05	5.17	6.34	9.82	10.95	15.20	12.86	13.64
Electrical machinery	1.15	1.67	1.59	2.31	2.49	2.99	3.81	3.99	4.04	4.72
Transport equipment	2.17	4.23	7.18	7.73	4.86	8.35	8.89	11.40	11.49	9.47
Scientific equipment	0.72	0.93	0.61	0.78	0.77	0.93	1.15	1.14	1.39	1.17
Manufactured Exports	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Cattaneo: (1998)

5.9.3.2 SACU'S IMPORTS FROM THE REST OF THE WORLD AND SADC

Table 5.9 shows the sectoral composition of SACU's manufactured imports from the rest of the world and SADC respectively. Basic consumer goods imports (food down to furniture) in Table 5.9 are much higher in proportion (59.8 per cent) of SACU's imports from SADC than of SACU's imports from the rest of the world (11.3 per cent) in 1995. Of the manufacturing sectors, only in the case of rubber products, iron and steel, non-ferrous metals and metal products, are the shares in SACU's imports from SADC greater than the share in SACU's imports from ROW. According to (Cattaneo: 1998) 'There appears to be a high degree of complementarity between SACU and the rest of SADC as a whole in so far as the composition of their trade with one another is concerned'.

TABLE 5.9

COMPOSITION OF SACU'S TOTAL MANUFACTURED IMPORTS FROM ROW AND SACU'S IMPORTS FROM SADC.

	TOTAL EXCLUDING SADC (ROW)					SADC				
SECTOR	**1988**	**1990**	**1992**	**1994**	**1995**	**1988**	**1990**	**1992**	**1994**	**1995**
Food	3.84	3.69	4.57	5.06	5.04	26.80	16.87	14.97	17.50	20.22
Beverages	0.80	0.96	0.82	0.67	0.62	2.03	0.92	0.64	0.92	1.27
Tabacco	0.12	0.10	0.10	0.07	0.05	0.05	0.05	0.09	0.08	0.06
Textiles	3.70	4.28	4.15	3.56	3.27	10.37	16.05	16.21	15.72	15.22
Clothing	0.45	0.42	0.54	0.46	0.34	3.75	3.93	3.37	4.94	3.00
Leather	0.54	0.66	0.54	0.64	0.56	4.05	4.29	2.19	3.52	3.05
Footwear	0.44	0.45	0.59	0.64	0.72	2.18	3.39	3.62	3.63	4.15
Wood	0.74	0.82	0.79	0.80	0.73	4.07	7.25	7.51	7.61	9.30
Furniture	0.06	0.07	0.08	0.07	0.08	1.13	1.16	1.56	3.31	3.57
Paper	1.93	2.35	2.23	2.18	2.34	1.27	1.22	0.89	1.18	1.71
Printing/publishing	0.96	0.94	1.21	0.89	0.80	1.38	0.78	0.50	0.38	0.42
Chemicals	16.95	16.93	16.82	15.30	15.90	4.26	2.13	2.94	3.69	3.49
Rubber	1.00	1.18	1.23	1.11	1.16	0.87	2.34	7.53	1.93	1.64
Plastics	1.32	1.35	1.32	1.31	1.33	0.67	0.63	0.82	0.49	0.38
Pottery etc	0.16	1.18	0.22	0.18	0.17	0.17	0.30	0.37	0.12	0.04
Glass	0.44	0.52	0.55	0.46	0.46	0.05	0.29	0.08	0.30	0.36
Other non-metallic	0.74	1.10	1.01	0.82	0.93	3.42	3.34	4.26	3.49	2.77
Iron and steel	1.21	1.39	1.47	1.38	1.38	5.43	5.78	3.43	4.06	5.45
Non-ferrous	0.79	0.95	0.88	0.80	1.51	2.72	5.31	5.87	6.91	6.00
Metal products	4.38	4.30	3.96	3.04	3.11	10.10	10.50	12.44	6.72	6.49
Machinery	26.05	25.91	27.48	24.56	23.12	1.80	2.03	2.35	4.06	3.51
Electrical machinery	11.05	9.91	10.59	13.29	13.00	4.48	5.51	4.31	4.13	3.74
Transport equipment	17.81	19.75	16.77	17.84	19.09	8.34	5.18	3.68	4.83	3.44
Scientific equipment	4.53	4.77	5.10	4.78	4.28	0.60	0.75	0.39	0.47	0.7
Manufactured imports	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Cattaneo (1988)

5.10. EMPIRICAL EVIDENCE OF INTRA-INDUSTRY TRADE WITHIN A REGIONAL CONTEXT

This section provides measures of intra-industry trade between SACU and the rest of the world, South Africa and countries in Southern African region, SACU and countries in the Southern African region and SACU with the different regions of the world.

5.10.1 LEVELS OF INTRA-INDUSTRY TRADE BETWEEN SACU AND THE REST OF THE WORLD.

Using the three-digit and four-digit ISIC data published by the IDC (1996), the unadjusted Grubel-Lloyd (1975), B_i indices of intra-industry have been calculated for SACU and the ROW at current Rands for the period 1988 to 1995. The results for the selected sectors at the three-digit level and the four- digit levels are shown in Table A-7 and A-8. Table A-7 and Table A-8 also presents the average intra-industry trade for each sector for the period 1988 to 1995, absolute and percentage changes for both primary commodities as well as manufactures. There is significant intra-industry trade for most of the industries at both digit levels. Industries, which show high levels of intra-industry trade at the three-digit level generally, have sub-industries at the four-digit level, which have high levels of intra-industry trade. In order to adjust for the concept of categorical aggregation the Greenaway and Milner (1983) C_j index at the three-digit level have been calculated and shown in Table A-9. As expected the $B_i \geq C_j$ for all the industries. The comparison between the extent of intra-industry trade between South Africa and the ROW and SACU and the ROW is discussed in section 5.10.4.

5.10.2 INTRA-INDUSTRY TRADE BETWEEN SOUTH AFRICA AND COUNTRIES WITHIN THE SOUTHERN AFRICAN REGION

TABLE: 5.10

INTRA-INDUSTRY TRADE AND GNP *PER CAPITA* INCOME (1993)

COUNTRY	GNP PER CAPITA	B_i
Angola	650	1
Botswana	2530	16
Kenya	270	—
Lesotho	580	18
Malawi	230	42
Mozambique	80	12
Namibia	1460	21
Swaziland	1050	27
Tanzania	420	55
Uganda	190	—
Zambia	420	11
Zimbabwe	650	55
South Africa	2560	

Own computations of B_i from IDC DATA BASE (1996).

GNP *per capita*: Source: the World Bank Atlas, 1995, Maxwell Stamp, 1995

Table 5.10 provides the intra-industry trade values (unadjusted B_i) at the three-digit level for South Africa with countries in Southern African region. As noticed in chapter three much of South Africa's intra-industry trade takes place between it's major trading partners than between the SACU member countries and countries in Southern African region. Although the SACU agreement allows duty free movement of goods among member states, intra-industry trade for South Africa and member countries is very low as

indicated by the intra-industry indices; Botswana (16 per cent), Lesotho (18 per cent), Namibia (21 per cent) and Swaziland (27 per cent). A possible explanation for the low intra-industry trade values could be because of unequal levels of development as indicated by the GNP *per capita* incomes of the member states in SACU (Table 5.3). Greenaway (1989) argues that countries will similar *per capita* incomes and similar demand structures will form customs union, this will be an important basis for intra-industry trade.

Although the BLNS countries have very low *per capita* income in comparison to South Africa, with the exception of Botswana there seem to be some evidence of intra-industry trade, but of a small magnitude. Balassa (1979: 258) argues that countries with low but similar *per capita* income levels have much to gain from intra-industry trade in context of a regional union, because industrialization will occur in the framework of a larger market, allowing increased specialization and greater competition, and avoiding the establishment of relatively high-cost industries to serve protected national markets. It can also be argued that given the size of South Africa's GNP *per capita* income, South Africa trades less extensively with countries in SACU as well as countries in the Southern African region. The proportion of total exports and imports are provided to and from SADC are presented in Tables 5.4 and 5.5 respectively. Low levels of intra-industry between South Africa and countries in SADC could be because SADC countries are mainly exporters of primarily commodities and mainly importers of manufactured goods.

Low values of intra-industry trade between South Africa and the rest of the countries in region could be because of the unequal levels of development as expressed by the GNP *per capita* income in Table 5.10. Low levels of intra-industry trade for South Africa with countries in region could also be attributed to the different levels of industrial development in these countries when compared to South Africa. But more especially the reason for the low intra-industry trade index for South Africa with the countries in region given in Table 5.10, could be that if South Africa participates in extensive intra-industry trade in the region this could lead to trade diversion to South Africa (Holden 1996). As discussed earlier in this chapter, a 'successful' integration arrangement is one that results in trade creation as apposed to trade diversion.

South Africa records highest level of intra-industry trade Zimbabwe and Tanzania (55 per cent) for 1993 (Table 5.10). The relatively high level of intra-industry trade for South Africa with Zimbabwe could be attributed to similar industrial structures in both countries.

Balassa (1979) reports that intra-industry trade has assumed the greatest importance in countries that participated in some special or complementary agreements. The relatively high levels of intra-industry trade between South Africa and Zimbabwe could also be as the result of the special trade agreement that exists with Zimbabwe, as discussed in section 5.3.1.6. The intra-industry index is 42 per cent for South Africa and Malawi, which is relatively high as compared to most of the countries in the region. This could also be as a result special arrangement between South Africa and Malawi in terms of

trade as discussed in section 5.3.1.6. According to Balassa (1979) 'intra-industry trade specialization has assumed the greatest importance in countries that have participated in complementarity agreements'. The unadjusted intra-industry trade values for South Africa and countries in the PTA are discussed in chapter four.

5.10.3 INTRA-INDUSTRY TRADE BETWEEN SACU AND COUNTRIES IN THE SOUTHERN AFRICAN REGION

TABLE: 5.11
AVERAGE INTRA-INDUSTRY TRADE (B_i) FOR MANUFACTURES AT THE THREE-DIGIT LEVEL FOR SACU AND COUNTRIES IN THE SOUTHERN AFRICAN REGION

	1988	1989	1990	1991	1992	1993	1994	1995	AV (88-93)
Angola	0	14	4	0.1	5	3	5	7	5
Malawi	13	17	15	12	15	16	13	12	14
Mauritius	20	19	21	17	12	8	18	16	16
Mozambique	8	5	9	8	7	5	9	8	7
Tanzania	15	11	8	12	17	4	12	4	10
Zambia	17	14	10	13	13	12	14	14	13
Zimbabwe	45	43	44	37	47	42	37	37	42
World	40	43	48	51	54	55	55	53	50

Own computation. Source IDC Data Base (1996)

Before one explains the levels of intra-industry trade it must be borne in mind that SACU trade has been under stated or under reported during the apartheid years. However given this limitation the following results is be reported, the intra-industry trade for SACU and countries in region paints the same picture as for intra-industry trade for South Africa and countries in the region. Once again the average (B_i) is used to compare the levels of intra-industry trade in the region for the period 1988-1993. The last column of Table 5.11 gives the average intra-industry trade for the period 1988 to 1993. The intra-industry

trade values for SACU with the countries in the region are low (below 50 per cent) for all the years under review. The possible reason for low values of intra-industry trade explanation could be as a result of unequal levels of development shown by their GNP *per capita* income (Table 5.3). It is also interesting to note that intra-industry trade is lower for SACU and member countries in the region than between SACU and rest of the world. Although intra-industry trade between SACU and the member states are low, there is nevertheless potential scope for intra-industry trade to grow as the region becomes integrated and developed. It is argued that as a country moves up the 'ladder of development' the scope for intra-industry trade will increase Tharakan (1984).

TABLE 5.12
AVERAGE INTRA-INDUSTRY TRADE ($\overline{B_i}$) FOR MANUFACTURES AT THE FOUR-DIGIT LEVEL FOR SACU AND COUNTRIES IN THE SOUTHERN AFRICAN REGION.

	1988	1989	1990	1991	1992	1993	1994	1995	AV (88-93)
Angola	0	10	1	0	2	2	2	2	2
Malawi	11	9	10	9	10	13	12	13	11
Mauritius	15	13	15	18	8	12	11	12	13
Mozambique	6	4	6	4	4	5	7	6	5
Tanzania	7	9	1	6	5	13	8	4	7
Zambia	11	9	6	8	6	7	8	8	8
Zimbabwe	30	33	31	27	33	36	32	33	32
World	33	36	40	41	44	46	50	47	42

Own computation. Source IDC Data Base (1996)

Table 5.13 provides the average B_i between SACU and countries in the region at the four-digit level. It is evident that the concept of intra-industry trade does not disappear as one moves to a lower level of aggregation. The product-by-product, unadjusted Grubel-

Lloyd (1975) B_i indices between SACU with each country in the Southern African region at the three-digit and four-digit level is shown in Table A-10 to Table A-17.

5.10.4. LEVELS OF INTRA-INDUSTRY TRADE FOR MANUFACTURES BETWEEN SA AND ROW, SACU AND ROW AND SADC (EXCLUDING ZIMBABWE).

TABLE: 5.13
AVERAGE INTRA-INDUSTRY TRADE (B_i) FOR MANUFACTURES AT THE THREE-DIGIT LEVEL FOR SA AND ROW, SACU AND ROW AND, SACU AND SADC (EXCL. ZIM.)

YEAR	SA WITH ROW	SACU WITH ROW	SACU WITH SADC (EXCLUDING ZIM.)
1988	55	40	43
1989	57	43	36
1990	58	48	32
1991	59	51	25
1992	59	54	33
1993	59	55	29

Own computation. Source IDC Data Base (1996)

TABLE 5.14
AVERAGE INTRA-INDUSTRY TRADE B_i AT THE FOUR-DIGIT LEVEL FOR SA AND ROW, SACU AND ROW AND SACU AND SADC.

YEAR	SA WITH ROW	SACU WITH ROW	SACU WITH SADC
1988	49	33	31
1989	52	36	28
1990	54	40	27
1991	53	41	44
1992	53	44	55
1993	53	46	46

Own computation. Source IDC Data base (1996)

Table 5.13 and Table 5.14 provides the reader with South Africa's intra-industry trade with the rest of the world, SACU's intra-industry with rest of the world and SACU's intra-industry trade with the total SADC countries excluding Zimbabwe. It is interesting to note that South Africa's intra-industry trade with ROW is greater than SACU's intra-industry with ROW for all the years under review at both the three-digit as well as the four-digit level. The difference in each case is quite small. From table 5.13 it can be seen that except for 1988, SACU's intra-industry trade with ROW is more than SACU's intra-industry trade with SADC (excluding Zimbabwe). At the four-digit level the intra-industry trade value for SACU and ROW is more than the intra-industry trade value for SACU and SADC countries (excluding Zimbabwe) in 1998, 1989, and 1990, and smaller in 1991 and 1992 but equal in 1993 (Table 5.14).

5.10.5 INTRA-INDUSTRY TRADE BETWEEN SACU AND REGIONS OF THE WORLD.

TABLE: 5.15

AVERAGE INTRA-INDUSTRY TRADE ($\overline{B_i}$) FOR MANUFACTURES AT THE THREE-DIGIT LEVEL BETWEEN SOUTH AFRICA AND REGIONS OF THE WORLD.

	1988	1989	1990	1991	1992	1993	AV (88-93)
Australia and New Zealand	49	45	46	45	51	51	48
Brazil	19	24	24	28	38	41	31
Caribbean	22	22	28	22	40	33	29
Central America	37	14	38	46	24	28	30
China and Machau	26	10	8	12	17	10	11
East Asia	31	32	41	38	38	35	37
Eastern Europe	8	24	21	36	41	37	32
Japan	22	25	30	28	26	28	27
Marcos Excluding Brazil	42	20	29	30	41	30	30
Middle East	37	46	38	37	33	37	38
North Africa	18	34	12	21	41	41	30
North America	28	27	30	29	36	35	31
Oceania Excl Australia and NZ.	56	40	35	39	29	33	35
South America Excl Mercosur	29	20	22	17	26	16	20
South Asia	29	36	25	37	31	32	32
Sub-Sarah Africa	15	19	15	19	16	14	17
Western Europe	34	33	37	40	41	40	38
SACU with rest of the world	40	43	48	51	54	55	50
SADC Excluding Zimbabwe	43	36	32	25	33	29	31
South Africa with ROW.	55	57	58	59	59	59	59

Own computation. Source IDC Data Base (1996)

Table 5.15 provides the average share of intra-industry trade for SACU with regions of the world. For comparative purposes the average intra-industry trade values for SACU with ROW and SA with Row is included. Table 5.15 also provides the average intra-industry trade for the period 1988 to 1993 in the last column. The highest average intra-

industry trade values between SACU and regions of the world (1988 to 1993) were recorded for Australia and New Zealand at 48 per cent. The lowest average intra-industry trade value between SACU and the various regions for the period (1988 to 1993) was with China and Machau at 11 per cent. South Africa's intra-industry trade with ROW and SACU's intra-industry trade with ROW is more than SACU's intra-industry trade with regions of the world in most cases (Table 5.15). The reason for low intra-industry trade values could be as a result of high transport costs or the possibility of SACU's access to these overseas markets. The product-by-product, unadjusted Grubel-Lloyd (1975) B_i indices between SACU and each region of the world at the three-digit (SIC) level are shown in Table A-18 to A-35.

5. 11. CONCLUSION

It has often been argued that the main rational behind integration has been the desire to achieve economic development, industrial development and technological development. According to Morawetz (1974), intra-regional trade could provide a stimulus for product diversification and improved competitiveness and allow for entry in the world market. The increased size of the market after integration can also allow the realization of economies of scale. While the exploitation scale economies in a larger regional market is seen as one of the major motive for integration, the question is whether the enlarged market in a regional union among countries of unequal levels of development and size will, in sectors which scale economies are important, mainly benefit producers in the larger countries. This cannot be concluded, *a prior*, that this will be the case, it may in

fact be that smaller countries are the major beneficiaries, because of the higher excess cost they incur of operating at below optimal scale.

The discussion in Section 5.7 considered the implications of increased intra-industry trade specialization as a result of regional integration, by allowing for product differentiation in the presence of increasing returns. While intra-industry trade is predominantly a feature of trade between high-income countries at a similar stage of development, the analysis suggests that there is scope for intra-industry specialization between similar low-income countries, as well as unequal levels of development. It is also argued that the cost of adjustment to trade liberalization is likely to be easier when the ensuing trade expansion is of intra-industry trade. Balassa (1979: 258) argues that countries with low but similar *per capita* income levels have much to gain from intra-industry trade in context of a regional union, because industrialization will occur in the framework of a larger market, allowing increased specialization and greater competition, and avoiding the establishment of relatively high-cost industries to serve protected national markets. Balassa (1979: 266) argues that the ease of adjustment in the case of intra-industry trade specialization, in contrast to the adjustment costs of inter-industry specialization, provides an argument for trade integration between these countries.

Given the potential benefits of intra-industry trade specialization, the prospects for achieving these gains in a regional union is important. The evidence on Latin America suggests that there may be potential scope for intra-industry trade in a regional union with other developing countries than in the case of multilateral liberalization. Intra-industry

trade between SACU and the ROW, South Africa and SACU and countries within the Southern African region as well as SACU and regions of the world were reported in Section 5.9 and 5.10. It was concluded that the intra-industry trade between South Africa and countries in the Southern Africa region as well SACU and countries in the Southern Africa region is relatively low when compared to intra-industry trade between South Africa and its major trading partners as discussed in chapter four. This could be attributed to the level of development in these countries of the world compared to South Africa or that these countries domestic production is mainly concentrated in primary commodities. Nevertheless there remains potential for the growth of intra-industry trade within the Southern African region, as the countries in the region move up the 'ladder of development' and become more similar. It is perhaps suggested that if the factor intensities of trade, as well as *per capita* income levels, are more similar among Southern African countries (or among a subset of Southern African countries) than between these countries and their trading partners in the rest of the world, then regional liberalization could provide benefits from intra-industry specialization which may not be readily attainable through multilateral liberalization.

It must be borne in mind that the results in Section 5.10 were for period before the April 1994. South Africa joined SADC only in 1994. South Africa has committed itself to the formation of a SADC FTA by signing a Trade Protocol in August 1996. It will be interesting to examine the level and extent of intra-industry trade after this period in terms of trade policy reforms. This analysis falls outside the scope of this study. It is

suggested that the level of intra-industry trade will be greater after 1996 than before 1996 due to the formation of the SADC FTA.

CHAPTER SIX

IMPLICATIONS OF INTRA-INDUSTRY TRADE FOR TRADE POLICY REFORM

6.1 INTRODUCTION

According to conventional wisdom, a removal of impediments to trade will cause a country to shift resources from import competing industries to export industries where the country has a comparative advantage resulting in an increase of intra-industry trade. Trade liberalization and decrease in transport costs will result in increase in intra-industry trade. Trade liberalization creates larger markets with increased opportunities for specialization, manufacturers are able to offer a greater variety of consumer goods, allowing for a larger scale of operations in existing products.

The most significant application on intra-industry trade concept has been the effect of trade liberalization. A number of studies of the European trade patterns lend support to the hypothesis that trade liberalization leads to increased intra-industry trade, Benelux customs union Verdoorn (1960) and Europe Economic Community Balassa (1966). The same conclusion has been reached with respect to the Central American Common Market (Willmore: 1972). Intra-industry trade increases the welfare of consumers by offering them a greater range of varieties and decreasing the costs of trade liberalization. One of the crucial elements with intra-industry trade theory is the implication and impact of trade liberalization on the levels of intra-industry trade and the structural adjustment. Theory suggests that lower protection rates will lead to increased intra-industry trade than inter-industry trade. As Balassa (1977, p.250) observes, ' one may conclude that once manufacturing industries have

been established, the elimination of protective measures on the trade among developed countries does not appear to reverse the effects these measures had on industrial composition and the location of the industry'. Balassa(1977) and Grubel (1967) documented that the formation of European Economic Community increased trade among its members largely through intra-industry specialization rather than inter-industry specialization. Hufbauer and Chilas (1974) have argued that GATT tariff reductions favour intra-industry trade rather inter-industry trade, because the reduction in trade restrictions would involve more resource reallocation and income distribution. Hufbauer and Chilas (ibid) have shown intra-OECD trade has become more intra-industry trade as the factor propositions in the OECD become more similar. The chapter is organized as follows; section 6.2 presents Favey's (1981) model of intra-industry trade. This framework shows that the imposition of a tariff serves mainly to increase the range of domestic production within the industry, and therefore to reduce the volume and range of products traded. Section 6.3 presents Krugman's (1982) model of intra-industry trade, which shows intra-industry trade increases within the context of trade liberalization, and section 6.4 concludes.

6.2 THE EFFECTS OF TARIFFS ON INTRA-INDUSTRY TRADE (FALVEY: 1981)

According to this model the industry under consideration is assumed to possess a given stock of capital (K) and can hire labour at any given wage rate (W). Using these factors of production a country can produce a wide variety of products, which is given by α. The commodities are measured in units of capital and one unit of labour. Higher quality products require more capital-intensive techniques of production, and higher prices. Demand is a function of relative prices.

A two-country (abroad and home) world is assumed. The industry under consideration has a given stock of capital (K and K*, respectively) and faces given wage rates (W and W*, respectively). Capital is assumed to be immobile internationally but not nationally. The returns to capital (R and R*, respectively) adjust so as to maintain the full employment of the two capital stocks. Perfect competition is assumed in each industry, it is also assumed that foreign country has lower wage rates (i.e. W* < W). The cost of producing a unit of quality α can be represented by:

$$\Pi(\alpha) = W + \alpha R \text{ at home and } \Pi^*(\alpha) = W^* + \alpha R^* \text{ abroad.}$$

With R* > R, there exists some marginal qualities (α_1) such that $\Pi(\alpha_1) = \Pi^*(\alpha_1)$, and correspondingly

$$\alpha_1 = \frac{W - W^*}{R^* - R} \qquad (1)$$

For any other quality

$$\Pi(\alpha) - \Pi^*(\alpha) = \left(\frac{W - W^*}{\alpha_1}\right)(\alpha_1 - \alpha) \qquad (2)$$

From equation (2), it is clear that the higher-wage home country has a comparative cost advantage in those qualities which require more capital-intensive techniques than the marginal quality and is at a comparative cost disadvantage in the (lower) qualities.

6.2.1 THE EFFECTS OF TARIFFS ON INTRA-INDUSTRY TRADE

An ad valorem tariff at rate t is assumed to be imposed on all imports in the product category or group. The implementation of the tariff will increase the cost of the product, which the home country previously imported. The home country can now produce the product at a lower cost. This causes an increase in the demand for domestic capital because domestic consumers have switched their consumption from the foreign product to the home product. The demand for the foreign capital has been decreased. In sum, the implementation of a tariff has caused the demand for the foreign capital to decrease and the demand for the domestic capital to increase.

The demand for the home and foreign capital can be expressed as follows:

$D_K(R, R^*, t)$ representing home and $D_{K}(R, R^*, t)$ representing foreign respectively, taking the effect of the tariff into consideration, and differentiating their excessive demand one arrives at:

$$E_R dR + E_{R^*} dR^* + E_t dt = 0, \qquad (3)$$

$$E_{R} dR + E_{R^*} dR^* + E_t^* dt = 0, \qquad (4)$$

where $E_t > 0$ and $E_t < 0$. R and R^* represents rewards to capital for the home and foreign markets respectively. Applying the general assumption to the effects of the tariff implies $|E_t| > |E_t^*|$, because although the tariff switches demand from the foreign to home capital, at given rentals, there is a net loss in demand for capital since overall prices are higher. Solving for the changes in the returns to capital in the two countries yields :

$$dR = \frac{\left(E_{t}.E^{*}_{R^{*}.} - E_{t}E_{.R^{*}}\right)}{\Delta}dt, \qquad (5)$$

$$dR = \frac{\left(E_{t}E_{.R} - E^{*}_{R}E_{R}\right)}{\Delta}dt, \qquad (6)$$

None of the terms (5) and (6) has an unambiguous sign in general; however, under our general assumption $\left|E_{t}.\right| > \left|E_{t}\right|, \left|E^{*}_{R^{*}}.\right| > \left|E^{*}_{R}\right|$ and $\left|E_{R}\right| > \left|E^{*}_{R}\right|$ giving $dR^{*} < 0$, but the change in the home rental remains ambiguous. The decrease in foreign capital may just be enough to offset the effects of the tariff on both home and foreign excess demand for capital. It this is not the case, then a residual change in the home rental will be required, but this could be in either direction.

The 'benefits'of tariff to the home country appear to come in the form of reduced foreign prices rather than a rise in the return on home capital. In addition, one must also distinguish between two marginal qualities $\left(\alpha_{1}', \alpha_{2}'\right)$, with the foreign country only producing in the range $\left(\alpha, \alpha_{1}'\right)$, both countries producing, but neither trading in the range $\left(\alpha_{1}', \alpha_{2}'\right)$, and the home country being the only producer in the range $\left(\alpha_{2}', \bar{\alpha}\right)$. The definitions of α_{1}' and α_{2}' imply that:

$$\Pi\left(\alpha_{1}'\right) = (1+t)\Pi^{*}\left(\alpha_{1}'\right) \qquad (6)$$

and

$$\Pi\left(\alpha_{2}'\right) = \Pi^{*}\left(\alpha_{2}'\right) \qquad (7)$$

From equation (6) one arrives at, $d\alpha_1^t / dt < 0$ and from (7) $d\alpha_2^t / dt > 0$, so that raising the home tariff serves to widen the range of non-traded qualities. According to Falvey (1981), the following can be concluded from the model; while the tariff leads to a decline in the foreign reward on capital, the reward on the domestic capital appears to be unambiguous. Secondly, while the home industry will recapture the home market in some qualities previously imported, it will also lose some of its market as a consequence of the resulting decrease in the foreign capital costs. Thirdly, given that the imposition of the tariff creates a range of non-traded qualities, a tariff reduction will have intra-industry trade by reversing this process. The framework therefore predicts that the formation of a preferential trading area, will lead to an increase in intra-industry trade among its members. The model also predicts that there will be an increase in the range of exports and imports for each trading partner, even if one decreases its tariff. Fourthly, that the framework represents a multi-product industry, one needs to distinguish between the output of the industry from the range of qualities it produced. It seems more likely that trade policy will be directed at influencing the range of outputs produced, or the range of qualities imported, rather than gross outputs or imports.

6.3 THE KRUGMAN MODEL (1982) OF TRADE LIBERALIZATION

The postwar liberalization of trade, benefited trade in manufactured goods between developed countries, leaving trade in primary commodities highly restricted. The model presented by Krugman (1982) draws on the work on the theory of intra-

industry trade by Dixit and Norman (1980), Lancaster (1980) and Krugman (1979, 1980).

Liberalizing trade within an industry leads to each country to expand both its import and exports in that specific industry. A country which is a net exporter in an industry will still have some demand for the products produced overseas, so net exporters will still be gross importers and vice versa. Thus the reciprocal removal of impediments to trade i.e. trade barriers can lead to increased sales by producers in both countries. If this is true then trade liberalization will be easy to achieve. Producers in both countries will gain from mutual trade liberalization in an industry if neither country has a too bigger comparative advantage, and the products within the industry are strongly differentiated. Trade is more liberal in products that are strongly differentiated commodities than in homogenous primary commodities, more restricted in between countries with different wage-rental ratios than between countries with similar factor prices.

The model is based on the following assumptions:

(a) An economy consisting of a number of 'industries' each producing many products. The concept on an 'industry' poses a major problem when dealing with the concept of intra-industry trade, should a 'supply-side' or 'demand side' measure be used. For the purpose of this model Krugman (1982) defines an 'industry' has having products relatively close substitutes on the 'supply side' as well as the 'demand side'.

(b) Products with similar characteristics will have similar factor inputs.

(c) Consumers in the economy are assumed to have similar tastes and preferences.

The consumer's tastes and preferences are represented by the utility function:

$$U = \left[\sum_{j=1}^{K} \delta_i C_i^{\gamma} \right]^{1/\gamma} \qquad \gamma < 1, \qquad (1)$$

C_i is defined as follows:

$$C_i = \left[\sum_{j=1}^{N_i} c_{ij}^{\theta_i} \right]^{1/\theta_i} \qquad 0 < \theta_i < 1, \qquad i = 1,....., K \qquad (2)$$

C_{ij} represents the individual consumer's of the j^{th} product of industry i, is a large number of potential products in the i^{th} industry. N_i is a large number of potential products in the i^{th} industry. The inter-industry elasticity of substitution is $1/1-\gamma$. While the intra-industry elasticity of substitution, which varies across industries is $1/1-\theta$ for the i^{th} industry. On the supply side the commodities are produced by a single factor of production, 'labour,' which is wholly external to that industry. Thus the labour supply L_i corresponds to each industry i. Full employment of resources i.e. resources are fully utilized, therefore the resource constraint can be written as:

$$L_i = \sum_j \ell_{ij} \qquad i = 1,....., K, \qquad (3)$$

where ℓ_{ij} is the labour used in the production of product j of industry i.

The factor of production labour is assumed to contain a fixed set-up cost and constant marginal costs thereafter:

$$\ell_{ij} = 0 \text{ if } q_{ij} = 0 \qquad i = 1,\ldots\ldots,K,$$

$$= \alpha_i + \beta_i q_{ij} \text{ if } q_{ij} > 0 \qquad j = 1,\ldots\ldots N_i, \qquad (4)$$

where q_{ij} is the output of the j^{th} product of industry i and the parameters α_i and β_i are constant across the products within an industry. The equilibrium condition will take the form as in case of monopolistic competition. Each product will be produced by a single firm, no barriers to entry exist and profits will be driven to zero.

Considering the pricing behavior, if the number of firms in the industry is large, each firm can disregard inter-industry substitution and concentrate on intra-industry competition. Thus each firm in the i^{th} industry will have a demand with an elasticity equal to the industry elasticity of substitution:

$$\varepsilon_i = 1/1-\theta_i \qquad i = 1,\ldots\ldots,K, \qquad (5)$$

Profit maximizing pricing behavior will involve setting the price at $\varepsilon/\varepsilon_i - 1$ multiplied by the marginal cost, to get:

$$p_i = \frac{\varepsilon_i}{\varepsilon - 1}\beta_i w_i \qquad i = 1,\ldots\ldots,K, \qquad (6)$$

$$= \theta_i^{-1}\beta_i w_i$$

where p_i is the profit-maximizing price of firms in industry i, which is the same for all the firms and w_i is the wage rate of the industry i's sector specific labour. Considering the profitability of firms, economic profits earned by a firm in the industry i, with price p_i and sales q_i, is represented as follows:

$$\pi_i = p_i q_i - (\alpha_i + \beta_i q_i) w_i \qquad i = 1,\ldots\ldots,K . \qquad (7)$$

By using the pricing policy from equation (6), equation (8) can be written as:

$$\pi_i = \left[\theta_i^{-1} \beta_i q_i - \alpha_i - \beta_i q_i\right] w_i \qquad i = 1,\ldots\ldots K . \qquad (8)$$

If free entry and exit exists, the number of firms in the industry will decrease if profits are negative and increase if profits are positive. In equilibrium $\pi_i = 0$. This can be used to determine the equilibrium level of output:

$$q_i = \alpha_i \theta_i / \beta_i (1 - \theta_i) \qquad i = 1,\ldots\ldots,K . \qquad (9)$$

Given the size and the number of firms, the products actually produced within an industry can be determined from the full employment condition:

$$n_i = L_i / (\alpha_i + \beta_i q_i)$$

$$= L_i (1 - \theta_i) / \alpha_i \qquad i = 1,\ldots\ldots,K . \qquad (10)$$

The demand for an industry's output is determined by utility function equation (1), and the relative supplies are determined by the sector-specific labour forces L_i. The above model gives rise to the equilibrium condition in which all industries are monopolistically competitive, containing a number of firms producing differentiated products and charging prices above marginal cost.

6.3.1 COMPARATIVE ADVANTAGE AND THE PATTERN OF TRADE

This model is based on the assumption that there exists another economy (country 2) very similar to the discussed in the previous section. It is also assumed that this economy has the same technology and it's consumer's have the same utility function

(1). The economy only differs in the endowment of industry specific-labour supplies, which is represented as follows as L_i^*, $i = 1,\ldots\ldots,K$. Zero transport costs are assumed to exist. Given the identity of utility and cost functions in the two countries, pricing policy and the equilibrium size of each firm in each industry are the same for both countries.

Price is a markup on marginal cost:

$$p_i^* = \theta_i^{-1}\beta_i^{-1}w_i^* \qquad i = 1,\ldots\ldots K. \qquad (11)$$

Output is determined by the condition of zero profits:

$$q_*^i = \alpha_i\theta_i / \beta_i(1-\theta_i) \qquad i = 1,\ldots\ldots,K. \quad (12)$$

The number of products produced in country 2 in each industry is proportional to its labour force in that industry:

$$n_i^* = L_i^*(1-\theta_i)/\alpha_i \qquad i = 1,\ldots\ldots,K. \qquad (13)$$

Since each firm can costlessly differentiate their products from others, no two firms will produce the same product; thus firms in different countries will specialize in different products (varieties). Given the symmetry of the problem, wages in each industry will be equalized across countries:

$$w_i = w_i^* \qquad i = 1,\ldots\ldots,K. \qquad (14)$$

6.3.2 BEFORE TRADE

Before trade the two countries are regarded as a single or integrated economy (world economy). The industries in the world economy have labour forces

$L_1 + L_1^*, \ldots\ldots, L_{K+} L_K^*$; and these forces receive equilibrium wage rates $w_1 = w_1^*, \ldots\ldots, w_K = w_K^*$. If Y equals country 1's income, and Y^* equals country 2's income, the following equations are derived:

$$Y = \sum_{i=1}^{K} w_i L_i, \qquad (15)$$

$$Y^* = \sum_{i=1}^{K} w_i L_i^*. \qquad (16)$$

Wage rates w_i are determined by demand. Since both countries have identical tastes and preferences, consumers in both countries will spend the same proportion of income on each industry's products:

$$n_i p_i q_i + n_i^* p_i^* q_i^* = \pi_i (Y + Y) \qquad (17)$$

where π_i, the proportion of expenditure on industry's $i's$ products is dependent on relative prices. Because profits are zero, sales of an industry equal its factor payments:

$$w_i L_i + w_i^* L_i^* = \pi_i (Y + Y^*). \qquad (18)$$

6.3.3 PATTERN OF TRADE

X_i is assumed to be country 1's export in industry i. Consumers in country 2 will spend a share π_i of its income on industry i 's products. Simultaneously, consumers will spend an equal share of it's expenditure on each of the products within the industry. The share of expenditure on country 1's products is $n_i / (n_i + n_i^*)$.

Thus the value of i exports is:

$$X_i = \frac{\pi_i n_i}{n_i + n_i^*} Y^*$$

$$= \frac{\pi_i L_i}{L_i + L_i^*} Y^* \qquad i = 1,.....K \quad (19)$$

Similarly country 1's imports are:

$$M_i = \frac{\pi_i L_i^*}{L_i + L_i^*} Y \qquad i = 1,.....K \qquad (20)$$

Equation (19) and (20) can be used to show two important features of trade patterns.

(a) A country's net export position in an industry is based on its relative factor endowments of the industry specific-labour factor. Formulas such as the revealed comparative advantage are used to generate indicators of comparative advantage from existing trade data:

$$R_i = In(X_i / M_i). \qquad (21)$$

From equation (19) and (20), we get:

$$R_i = In(L_i / L_i^*) - In(Y / Y^*) \qquad (22)$$

Since Y / Y^* is the term common to all industries, the ranking of industries by revealed comparative advantage is determined by the relative factor endowments.

(b) The second feature concerns the importance of intra-industry trade. From equation (19) and (20) it is apparent that a country will import even where it has a comparative advantage, export where it has a comparative disadvantage.

The common Grubel-Lloyd (1975) index used to measure intra-industry trade:

$$I_i = 1 - \frac{|X_i - M_i|}{(X_i + M_i)} \qquad (23)$$

This equation can be rewritten as follows:

$$I_i = \frac{2}{1 + \exp|R_i|} \qquad (24)$$

Intra-industry trade will exist in industries in those industries in which the absolute value R is closer to zero, i.e., in which comparative advantage is weak.

6.3.4 THE EFFECTS OF TRADE LIBERALISATION

This section is based on the assumption that industry i, is subject to trade restriction. A simultaneous removal of impediments to trade or trade restrictions by both countries will increase the welfare of producers in the country with a comparative advantage or a comparative disadvantage. This is because the products of different countries are imperfect substitutes for each other. Removing trade barriers offers consumers in both countries a wider range to choose from and may lead them to spend a larger share of their income on industry i's products.

If the products are sufficiently differentiated and comparative advantage is weak, this effect can raise the industry specific wage rate in the country, which has a comparative disadvantage.

To prove the effects of liberalization the following assumptions are necessary:

(a) Industry i is taken to be 'small', so as to eliminate the effect of trade liberalization on national income on other industries' prices.

(b) Before liberalization, trade in industry i is prohibited. After liberalization trade is completely free.

(c) Country 1 and country 2 are assumed to have equal national incomes: Y=Y*.

The important aspect of this analysis is the existence of many products within each industry and the value consumers place on diversity. According to Krugman (1982), this aspect can be viewed as creating a divergence between physical output in an industry and 'true' output taking into account diversity. Considering equation (1) and (2), one way of analyzing this is to think of consumers assembling final consumption goods C_i from components C_{ij} (Ethier 1980). The output of these final goods depends on the diversity of products available as well as on physical output.

An index of 'true' output for industry i is as follows:

$$Q_i' = \tilde{n}^{1/\theta_i} q_i, \qquad (25)$$

where $\tilde{n}_i$ is the number of products available and q_i is the output of a single product. There is also a divergence between the actual prices of products and the 'true' price index reflecting the value of diversity. For any given set of prices of products in an industry, the price of the final good assembled from these products will decrease if

the diversity or range of products increases. From equation (1), the 'true' price index can be derived:

$$P_i^t = \tilde{n}^{(\theta_i - 1)/\theta_i} p_{i,} \qquad (26)$$

where p_i is the price of a representative product.

Before liberalization can occur, $\tilde{n}_i = n_i$ is the number of products produced domestically, after trade, $\tilde{n}_i = n_i + i$ is the number of products produced by the integrated economy or worldwide. As noted by Ethier (1979), increasing returns apply on a world scale. Considering the situation of the industry before trade liberalization, n_i, q_i and p_i are derived from equations (6), (9), and (10), and by rewriting the results in logarithmic form, the following equation is obtained:

$$InQ_i^t = In\alpha_i\theta_i / \beta_i(1-\theta_i) + \theta_i^{-1} InL_i(1-\theta_i)/\alpha_i \qquad (27)$$

for the true output index, and:

$$InP_i^t = In\theta_i^{-1}\beta_i w_i - \frac{1-\theta_i}{\theta_i} In(1-\theta)/\alpha_i. \qquad (28)$$

The demand for true output will depend on income and the price level. The utility function ensures that all industries will face an income elasticity of demand of one and a price elasticity of demand of $1/1-\gamma$.

The demand function for true output and prices is represented by:

$$InQ_i^t = A_i + InY - \frac{1}{1-\gamma} InP_i^t, \qquad (29)$$

A_i represents a constant term.

Since the industry in the economy is assumed to be 'small', and considering the liberalization of trade in one industry at a time, the relative prices of all the other industries' products is taken as fixed and all other output and factors of production can be regarded as a composite commodity. Equation (29) can be used to solve the wage rate of the industry i labour. By using equation (27) and (28) the following expression is derived:

$$Inw_i = K_i + (1-\gamma)InY - \frac{\theta_i - \gamma}{\theta_i} InL_i, \qquad (30)$$

where K_i represents all the terms, which will not change when, trade is liberalized.

Trade liberalization allows the economy to become larger, with an income Y + Y*=2Y and with an industry i labour force of $L_i + L_i^*$.

σ_i is defined as country 1's share in the i^{th} industry labour force:

$$\sigma_i = L_i /(L_i + L_i^*) \qquad (31)$$

Because Y and Y* are assumed to be equal, σ_i can be regarded as index of comparative advantage. If $\sigma_i \leq 0.5$, using the definition of σ_i, the change in the wage rate in industry i can be written as:

$$\Delta Inw_i = (1-\gamma)In2 + \frac{\theta_i - \gamma}{\theta_i} In\sigma_i \qquad (32)$$

In equation (32), there are three parameters: γ, which is common to all industries, and θ_i and σ_i, which are specific to industry i. σ_i (an index of comparative

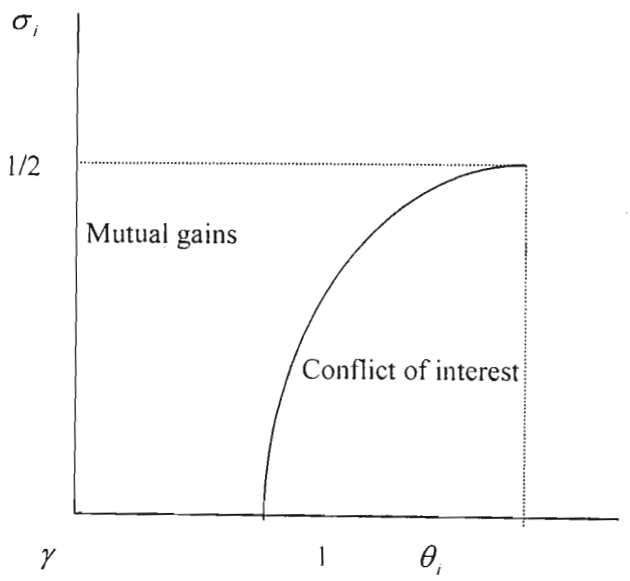
advantage); the smaller the value of σ_i, the greater the disadvantage of domestic producers and on the other hand the smaller θ_i value (the index of product differentiation) the more the value consumers place on product diversity and the greater the monopoly power of firms.

For any value of θ_i less than or equal to γ (a situation of highly differentiated products, ΔInw_i is positive). For any value for θ_i greater than γ, ΔInw_i is increasing in σ_i and decreasing in θ_i. $\Delta Inw_i = 0$ when θ_i=1, σ_i=0.5.

The analysis can be shown in the figure 7.1.

FIGURE. 7.1

GAINS FROM TRADE



The vertical axis, σ_i represents comparative advantage and the horizontal axis, θ_i represents product differentiation. In the lower right are industries with strong comparative and weak product differentiation. The industries with weak comparative advantage and strong product differentiation will benefit form trade liberalization in both countries.

6.4 CONCLUSION

Falvey (1980) has shown theoretically that one should expect countries, which have less barriers to trade to do more intra-industry trade with each other and even to import more from those with high tariffs. The volume of trade has shown to vary inversely with the level of trade restrictions, as been noticed empirically by Balassa (1977), Pagoulatos and Sorensen (1975), Hufbauer and Chilas (1974).

The gains from trade liberalization are likely to come through economies of scale defined as the reduction of costs obtained through the lengthening of production runs associated with the reduction of product variety in individual plants. The benefits of much of the increased to-way trade will be in the form of improvements in consumer welfare resulting from the availability of wider variety of products within each industry. It is also argued that the structural adjustment cost will be lower when there is increased intra-industry trade.

The model provided by Krugman (1982), gives some reason why trade is freer in some goods than others. The analysis provided suggest that bilateral trade liberalization will be biased towards producers in both countries if:

(a) Neither country has a strong comparative advantage in the industry and

(b) The products in the industries are strongly differentiated.

Trade liberalization has usually taken place between countries with fairly similar economic structure. It has favoured industries where comparative advantage, has been small, the growth in trade is largely in form of intra-industry trade. It is also easier to liberalize trade in industries producing products, which are strongly differentiated than in industries where products are more homogenous.

Thus tariff reductions as a result of economic integration may result in gains without any adjustment costs. This could serve as a theoretical justification for reducing political differences to allow for closer economic co-operation between countries with similar factor endowments.

CHAPTER SEVEN

THE IMPLICATION OF INTRA-INDUSTRY TRADE FOR TRADE POLICY REFORM IN SOUTH AFRICA

7.1 INTRODUCTION

The growth of intra-industry trade between developed and developing countries in more recent times has attracted much attention in the economic literature. The important implication for economic policy revolves around the impact of trade liberalization and the extent of structural adjustment. The nature of trade has important implications for the process of structural adjustment to trade liberalization and the extent of the cost to be borne. It is argued that the cost of adjustment is lower when the new trade is intra-industry type because disruption is minimized when adjustment is internal to an industry (Balassa, (1972); Caves, (1981); Finger, (1975); Lundberg and Hansson (1986).

It is easier to transfer and adapt resources within firms or industries than to switch them from one industry to another. Krugman (1981) has formally shown that when countries are similar in factor endowments, both parties tend to gain from trade liberalization and the consequent intra-industry trade poses lesser adjustment problems than in the standard case. The possibility of lower adjustment costs suggests that the prospects for a common market are higher when more of the existing and potential trade is intra-industry trade. Marvel and Ray (1987) argue on political economy grounds that high levels of intra-industry trade make protection more difficult to obtain and the freeing of trade less resistant. The chapter is broken up as

follows; Section 7.1 discusses the concept of structural adjustment and intra-industry trade and draws on some empirical evidence, Section 7.2 focuses on empirical evidence of trade policy and intra-industry trade. Section 7.3 examines the effect of the South Africa's tariff structure on intra-industry trade.

7.2 STRUCTURAL ADJUSTMENT AND INTRA-INDUSTRY TRADE.

The production structure and the reallocation of productive resources in a small open economy are mainly determined by world market prices, domestic factor supplies, and technology and trade policy. A change in any of these variables will cause structural adjustment problems, that is the reallocation of resources between firms and industries. This process could imply adjustment problems or adjustment cost of different kinds.

In the endowment based models or traditional based models of a small open economy, markets are perfectly competitive, factors of production are homogenous and perfectly mobile between sectors, production techniques are identical to all firms in an industry and factor prices are perfectly mobile. A change in the determinants of the pattern of trade and production (e.g. a change in relative commodity prices, or a change in the relative factor endowments in the home country or aboard will result in the excess demand for some factors and excess supply of others). In this model, however there will be adjustment problems only because the prices of factors of production have changed, and there will be redistribution of income from one factor of production to the other. Following what Corden (1974) terms a social welfare

function, where an absolute reduction in real income or purchasing power for any group should be avoided, this could imply a reduction in social welfare. This is also defined by Krugman (1981) as 'serious distribution problems' as involving absolute losses from trade. A change in world-market prices will lead to changes in the income distribution and the real income of factors of production, but full employment remains. On the other hand when factor prices are rigid, changes in goods prices will in general cause unemployment of factors of production in the sector with decreasing relative prices. According to Chacholiades (1978) and Neary (1985), even if factors of production are mobile, factor price rigidity can give rise to unemployment of the factor used intensively in that sector.

To determine whether intra-industry trade and specialization will give rise to any adjustment problems, or at least if these problems will be less than in the case of inter-industry trade will depend on the following:

(a) The degree of homogeneity of industries (on that level where intra-industry trade is measured) in terms of the relative requirements of physical capital and skilled and unskilled labour.

(b) On the intra-industry mobility of these resources.

(c) On the homogeneity of these factor categories.

Labour as a factor of production can be classified according to different criteria, such as education, working experience, employer, industry, and residential location. Adjustment problems may arise because of an increase in international trade that

leads to excess demand for some categories of labour and excess supply of others. Structural unemployment can arise if wages are flexible and labour is not perfectly mobile between industries, firms, regions, or skill groups.

If factors of production used in an industry are perfectly homogenous, if there is perfect intra-sectoral factor mobility, and if all firms and plants in an industry use factors in identical proportions, then a balanced increase in trade in a given industry (i.e. an equal increase in exports and imports) will cause no adjustment problems at all; neither through unemployment or income distribution. This is as a result of no net change in the demand for any factor. Intra-industry specialization will depend mainly on intra-industry factor mobility and equality of factor requirements.

The content and nature of trade has important implications for the process of structural adjustment to trade liberalization and the extent of costs to be borne. It has been argued that adjustment costs to trade liberalization are lower when the new trade is of intra-industry trade than inter-industry trade because it is easier to adapt and transfer resources within firms of industries than to switch them from one industry to another, Krugman (1981) and Caves (1981). This proposition was tested by Finger (1975) and Lundberg and Hansson (1986) with inconclusive results. Krugman (1981) used his analysis to support the view of Hufbauer and Chilas (1974), that the remarkable trade expansion of the post war period was relatively free of adjustment problems mainly due to intra-industry trade increasing dramatically during that period. Krugman (1981) has finally shown that when countries have sufficiently

similar factor endowments, both trading partners will gain from trade liberalization and the resultant trade poses fewer adjustment problems than in endowment based trade. Balassa (1966) and Aquino (1978) both argue that adjustment to trade is easier for increases in intra-industry trade than inter-industry trade. Hamilton and Kniest (1991) found some support for Australia and New Zealand that structural adjustment is greater in industries with low levels of intra-industry trade.

The possibility of lower adjustment costs suggests that the prospect for a common market is higher when more of the existing and potential trade is of intra-industry type. Marvel and Ray (1987) argue on political grounds that high levels of intra-industry trade make protection more difficult to secure and the freeing of trade meets less resistance.

Adler's (1970) study of the effects on the European steel industry following the creation of the European Coal and Steel Community (ECSC) offers some empirical evidence that the cost of adjustment to trade are lower when trade is of intra-industry type. Before the creation of the ECSC economists, using the Vinerian model of trade flows, assumed that the European steel industry would become concentrated in Germany and die out in other member countries. Alder (1970) showed that, on contrary, by 1966 a substantial trade of intra-industry trade increased from 49 per cent to 94 per cent in Germany, and 30 per cent to 69 per cent in France, 1 per cent to 54 per cent in Italy, 3 per cent to 65 per cent in the Netherlands, and 7 per cent to 41 per cent in Belgium-Luxembourg. Instead of the country dominating steel production,

different countries specialized in different kinds of steel. The author found specialization of this type in sixty percent of the products investigated. Alder (1970: 190) concluded, 'The significance of these findings lies in their ability largely to allay the apprehensions of the founding six countries; concerns over the welfare issues connected to the disruptive impact of resource allocation become immediately less wearisome.'

The implications of the increasing importance of intra-industry trade for trade politics are seemingly straightforward. This is because the distributional effects of intra-industry trade is not as stark as those of endowment based models of trade, and since adjustment costs from increases in intra-industry trade are low compared to those from inter-industry trade, individuals should lobby against policies that increase intra-industry trade in the way they should for endowment based trade. Endowment based trade are much more controversial than intra-industry trade. Japan's trade with the United States (US) is much more controversial than Japan's trade with other developing countries, because Japan's trade with the US is much more inter-industry trade than intra-industry trade. The trade between Japan and other developing countries is more intra-industry trade in nature (Alt et al., 1996). Adjustment problems may explain why agricultural trade is more contentious than manufacturing trade, because agricultural products are not as differentiated as manufactured products.

7.3 TRADE POLICY AND INTRAINDUSTRY TRADE.

Studies on the prevalence and theoretical basis of intra-industry trade anticipated the subsequent empirical work, which has treated intra-industry trade as a dependent variable and advanced a number of causal factors in the process.

7.3.1 EMPIRICAL EVIDENCE ON THE EFFECT OF TRADE POLICY ON INTRA-INDUSTRY TRADE.

One of the early concerns of researchers in the field of intra-industry trade was the relationship between trade impediments and intra-industry trade. In their work, Pagoulatos and Sorensen (1975) used data on United States intra-industry trade with the rest of the world in 102 industries at the three-digit SITC level in 1965 and 1967 as the dependent variable. Among the eight exogenous variables used in their investigation, four pertained to trade barriers. The four variables were: average height of tariff barriers, the height of non-tariff barriers, the US-EEC tariff differential, and the non-tariff barrier differential. Of these four variables, the height of non-tariff barriers and the non-tariff barrier differential did not yield significant coefficients.

In order to test the whether the similarity in *per capita* income exerts a positive influence on the level of intra-industry trade, the authors used a variable defined as the percentage of total OECD-US trade in manufactures in total. US trade in manufactures was also used. This variable yielded the expected positive sign and was significant at the 1 per cent level. Similar significance was also shown by a variable consisting of the mean distance shipped, suggesting that the level of intra-industry

trade is higher in commodities that have low transport costs. This is also evident in Krugman's (1980) model of intra industry trade, that transportation costs will reduce the volume of intra-industry trade. The variable that was used to take into account the level of aggregation, yielded a positive sign and was significant at the 5 per cent level, reflecting that some of the observed intra-industry trade is merely a statistical aggregation as argued by Lipsey (1976) and Finger (1975). The proxy used by Pagoulatos and Sorensen (1975) did not yield any significant results in the regression analysis for 1965 and 1967.

Balassa (1985) examined the determinants of intra-industry trade in bilateral trade among thirty-eight countries including a number of developing countries. The explanatory variables included: inequality of income levels between countries, country size, distance, trade orientation of the countries, plus a number of dummies to represent participation in integration arrangements, common language groups and the existence of former colonial ties. The results showed that the common characteristics explained much of the variation in the extent of intra-industry trade and the introduction of variables for economic integration, common language and colonial ties explained intra-industry trade among developing countries.

Balassa and Bauwens (1987) found that the level of intra-industry trade was positively correlated to average income levels, average country size, trade openness and participation in customs union and the existence of common borders and yielded the negative sign for income equality, inequality in country size and trading distance.

The authors also tested for the influence of other variables on intra-industry trade, these include product differentiation, marketing costs, the variability of profit rates and product standardization, represented by economies of scale and industrial concentration.

Loertscher and Wolter (1980) tried to explain differences in intra-industry intensity among and across industries simultaneously. They used a sample of bilateral trade flows among OECD countries. Among the determinants of intra-industry trade postulated by them, they made a clear distinction between 'industry hypothesis' and 'country hypothesis'. It was expected that the level of intra-industry trade among countries will be intense if the average of their development (average *per capita* income) is high, differences in their levels of development relatively small, the average of their market size small, barriers to trade low, geographical, linguistic and cultural differences small, and the trading partners belong to the same customs union or have common boarders. The industry hypothesis posited that intra-industry trade will be high or intense if the potential or scope for product differentiation is high, transportation costs low and the definition of an industry comprehensive.

The authors used The Grubel-Lloyd (1975) measure of intra-industry trade and an equivalent of the Aquino (1978) correction as alternative dependent variables. The following results were obtained, intra-industry trade intensity across countries is significantly and negatively correlated with differences in stage of development, differences in market size and the distance between the trading partners. The

correlation was significant and positive for the average market size and the existence of customs union. Among the product hypcthesis, the level of aggregation and a proxy for product group both showed positive and significant correlation. The product differentiation variable gave neither consistent nor significant results. The proxy for scale economies was significant and had a negative sign. Caves (1981), tests whether natural and artificial barriers to trade impede trade of intra-industry type. He found weak support for the hypothesis that intra-industry trade would be negatively related to tariff levels or the variance of tariff rates. He is also not convinced that they are good theoretical reasons for the relationship.

According to Grubel and Lloyd (1975:127) 'a large variation in protection within the manufacturing industries, as with the observed levels of intra-industry trade, a reflection of the obvious fact that manufacturing industries typically have a comparative advantage in some products and a comparative disadvantage in others'. A high variation in protection within industries also has an impact on the level of intra-industry trade. A relatively high level of protection for some products within an industry reduces the exports as well as imports of these highly protected products, since they compete directly with unprotected products for scarce factor within the same sector. A reduction of the variation in protection within such industries should lead to intra-industry adjustment by concentrating production and exports on a smaller range of products, allowing for the development of economies of scale and encouraging imports of other varieties. It is often argued that adjustment costs are lower when new trade is of intra-industry type because costs are minimized when

adjustment is internal to an industry. According to Gunasekera (1989:86), ' a reduction in the relatively high level of variation in protection will facilitate intra-industry adjustment and reduce the number of products in each industry.'

A comparison of the Korean trade and protection data by Gunasekera (1989), generated some support for the argument that a reduction in the variation of protection will lead to increased intra-industry trade in industries investigated. Manrique (1987) found negative support for the height of US-NIC trade and intra-industry trade, but statistically significant for only three countries.

Culem and Lundberg (1986) treated barriers to trade as just another form of trade resistance, like transport cost. They used a variable of trading distance as a measure of trade barriers, both artificial and natural. They hypothesized that because the demand for differentiated products from a given firm or country is price elastic (substitutes are available), trade resistance is likely to inhibit intra-industry trade than inter-industry trade. Their distance variable had the expected sign and was highly significant. A contrary view is expressed by Tharakan (1984 and 1986) that trade barriers can protect the development of industries not suited for the factor endowment pattern of the country. Once economies of scale are established and the products of such industries are demanded as new varieties, they ' might find the way into exports'. Since such production may not cover all varieties of the product concerned, imports of some of the varieties might continue, thus leading to intra-industry trade' (Tharakan 1986). The significance of variables used in Tharakan (1986) studies

indicates that artificial and natural barriers can promote intra-industry trade such as the Benelux and the developing world. Tharakan (1984) argues that the cost of protection cannot be offset by the reduction in adjustment costs flowing from intra-industry trade.

Marvel and Ray (1987) questioned whether trade liberalization encourages a greater degree of intra-industry trade, alternatively is intra-industry trade more inhibited by trade barriers than trade of the traditional, inter-industry type. *A prior*, the impact of trade liberalization is uncertain. Increased imports of an industry's product from a trading partner may: drive competing domestic firms out of business and contribute to inter-industry trade; or cause domestic firms to specialize in a more limited range of varieties and export more, thus contributing to intra-industry trade. Marvel and Ray (1987) show that the answer depends on how economies of scale combine with comparative advantage to determine the location of production facilities.

Toh (1982) found no support for the hypothesis that lower import restrictions will lead to higher levels of intra-industry trade. According to their study Lundberg and Hansson (1986), compared the product pattern of Swedish import restrictions (nominal and effective exchange rates) with the product pattern of intra-industry trade. According to their hypothesis, the tariff rate and intra-industry trade should be negatively correlated. The results did not support their hypothesis. In 1959, intra-industry trade was negatively correlated with effective exchange rates, but the coefficient (-0.150) was not significant, concerning nominal tariffs, the correlation was zero (0.002). In 1972 there was a significantly positive correlation both with both nominal (0.352) and effective (0.329) tariffs. However there was a strong positive

relationship between the initial level of intra industry trade in 1959 and the reduction in the period 1959 to 1972 of both nominal (0.495) and effective (0.443) tariffs rates. The authors concluded that in industries where trade is mostly of intra-industry type, there will be less pressure for new import restrictions as well as less resistance against lowering of tariffs, than in industries where net imports dominates. This means that the demand for protection will be less when specialization takes place within, rather than between industries. Their conclusion is reinforced by an examination of Swedish trade data. It turned out that the tariff reductions in 1959-72 have been largest in those industries where trade was mainly of intra-industry type.

According to the theories of political economy of protection, existing import restrictions are determined by the interactions of the demand for protection, from workers and capitalists in different industries, and the supply of protection by politicians. Increasing import competition can give rise to inter-industry or intra-industry trade in a specific industry. If labour and capital are to some extend specific to that industry, but mobile between firms, increased inter-industry trade (net imports) will lead to a decrease of the real income of factor owners or, with sticky wages to unemployment, whereas intra-industry trade will not be subject to these consequences. The demand for protection will therefore be higher in industries where foreign competition leads to net imports than in industries where there is mainly trade of intra-industry trade and specialization.

This argument is based on the hypothesis from the theory of protection, according to which the demand for protection from workers and capitalists in a given industry will be stronger, the more united the group is. When intra-industry trade occurs, there will

not be such unity, because some firms will gain and others will lose. This is confirmed by Lundberg (1981, 310) 'the level of tariff protection in Sweden tends to be higher, the higher the net import share of the market is, while the 'gross import' share was unrelated to tariff'. One would not expect trade unions and other groupings on an industry basis to be lobbying strongly for import restrictions, especially when it is assumed that this may trigger off industries in the export market. Therefore there will be low tariffs and quantitative restrictions in industries where trade is of intra-industry trade. As a results of intra-industry trade implying lower adjustment costs than inter-industry specialization, countries tend to reduce tariffs and quantitative restrictions mainly towards those trading partners with which there is mainly of intra-industry trade.

On the contrary, Gilligan (1997) argues that the political implication of new trade theory does not necessarily follow, although the costs of adjustment to intra-industry trade is lower, they do not fall on a single class, not on a single industry, but on a single firm. Because of this, ' lobbying for protection against intra-industry trade is virtually a private good' (Gilligan 1997, 456). According to the author, firms are much more ready to take political action in response to increases in intra-industry trade rather than inter-industry trade, although the costs of adjustment to them of that trade may be lower. Under intra-industry trade, the firm is a monopolist in that variety. Collection action problems disappear, when trade is of intra-industry type, the author argues that lobbying for protection is virtually a 'private' good. Gilligan (1997) analyzed the complaints lodged by firms with the International Trade

Commission. The results show that the higher the degree of intra-industry trade the more likely an industry will request for protection.

Havrylyshyn and Civan (1983), applied the cross-section analysis of sixty-two countries, including a large number of developing countries. They found that the larger the *per capita* income and the greater the diversity of its manufactured goods, the greater the amount of a country's intra-industry trade. Membership of a successful integration schemes such as the European Community also appeared to increase the level of intra-industry trade.

Where trade barriers are high and foreign markets are large, Rowthorn (1992) suggests that international investment will be an alternative to exporting and may be a substitute for the expansion of intra-industry trade. Hamilton and Kniest (1991) used a different approach when analyzing whether trade liberalization between Australia and New Zealand has led to more intra-industry trade. Instead of comparing levels of intra-industry trade with levels of protection, the authors ask whether a change in the level of protection of an industry is associated with a change in its level of intra-industry trade. No support was for the proposition that trade liberalization encourages intra-industry trade.

7.4.1 THE EFFECT OF TARIFFS ON INTRA-INDUSTRY IN SOUTH AFRICA

7.4.1 THE SOUTH AFRICAN TARIFF

Custom duties are levied in South Africa in terms of the Customs and Exercise Act, 1964. Since the 1920's the imposition of tariffs has been an important instrument used by government to protect domestic industries from competition, as part of a strategy of import substituting industrial growth. Selectivity is an important characteristic of South African trade policy. This means that tariffs are not implemented but vary according to criteria or guidelines determined by the Board of Tariffs and Trade. This Board provides advice to Government on tariffs. The average tariff rate for manufacturing production in 1990 was 29.6 per cent and the weighted average 22.6 per cent (IDC, 1990). Textiles, clothing and leather products, and metallic minerals have high nominal tariff rates. Users of capital goods were exposed to average tariff rate of 9 per cent in 1988, the users of intermediate goods to 20 per cent and consumers to 32 per cent (IDC, 1990). This shows that the level of protection increases as one moves from capital goods to intermediate goods and finally to consumer goods.

The South African tariff faces a very complex structure. South Africa has nearly 3000 tariff rates. The dispersion between the tariffs is very wide, varying in manufacturing from being zero rated to more than 3000 per cent in isolated cases. The complexity is furthermore increased by the use of formula duties aimed at countering disruptive competition. A formula duty is an ad valorem duty supplemented by a floor price for the product being imported. The reference prices, which serve as the basis for the

determination of formula duties, are frequently derived from the prices that reign in developed countries. South African manufactures compete against these high prices to the exclusion of cheaper commodities available in the developing countries.

Since tariff protection in South Africa is biased in favour of consumer goods, the effective rate of protection (protection of value added) for the so-called downstream products are often higher than the nominal protection rate. As part of the Uruguay Round of GATT, which will entail a reduction in the number of tariff lines, from 12000 to 6000 by the end of the five-year adjustment period, an exception is the motor vehicle industry. In addition, tariff lines, which currently have 80 different levels ranging from 0 per cent to 1 398 per cent, will be standardized into six levels, with a maximum tariff of 30 per cent (Cohen, 1995:3).

Belli, et al (1993) suggest a reduction in levels and complexity of import tariffs is an integral part of addressing the anti-export bias of the past trade policy. Tariff liberalization will reduce the price-increasing effect of protection, acting to deflate the economy (IDC, 1990).

7.4.2 EMPIRICAL EVIDENCE FOR SOUTH AFRICA

This section analyses the role of tariff structure on the level of intra-industry trade in South African manufacturing sector. The dependant variable (Bi) is calculated at the three-and-four digit level of aggregation for the manufacturing sub-sectors of SIC (Table A-1 and A-2). The first set of the independent variables (tariff structures), the effective rates of tariff protection at the three-digit SIC level is obtained from Holden (1990), calculated by the Bureau for Economic Analysis for industries in 1985. The

second set of independent variables (tariff structures), nominal tariff structure for the four-digit SIC sector is obtained from the Industrial Development Corporation (1990). Nominal rates of tariff protection measure the difference between local and world prices; the effective rate includes the protection that inputs from other industries enjoy.

7.3.3 REGRESSION RESULTS

		R^2
1985	**3-digit**	0.003*
1990	**4-digit**	0.007*
*Significant at the 95% level.		

The general consensus in economic literature is that the tariff rate and intra-industry trade should be negatively correlated. R^2 in the findings is low. It is concluded that there exists a weak support for the height of tariff barriers and intra-industry trade in South Africa. The results are therefore inconclusive. The possible reason could be because of the high dispersion of protection between and within industry groups and the imposition of tariffs by authorities distorts the trade patterns.

7.5 CONCLUSIONS

A general consensus is reached in economic literature that intra-industry trade is less likely to lead to less adjustment problems than the traditional type of inter-industry

trade caused by comparative models. Some support exists for the proposition that intra-industry trade is negatively associated with the level and variation of tariff rates. The existing low levels of intra-industry trade in manufactures could mean that large share of the adjustments required can be accomplished by intra-industry transfers on resources. From the regression analysis, a weak support is derived for the negative relationship between tariff structures and intra-industry trade. This is represented by the low R^2 values. The possible reason for this is the wide dispersion of tariff lines.

South Africa is currently engaging in reducing tariff rates at an average level of 30 per cent. Levels of production are high, therefore giving rise to low levels of intra-industry trade as discussed in chapter four. The proposed round of trade liberalization to be phased in, should lead to increased intra-industry trade in South Africa. Existing low levels of intra-industry trade in manufactures could mean that a sizeable part of adjustments required can be achieved by intra-industry and intra-firm transfers of resources. The prospective result of trade liberalization for South Africa is one increased intra-industry trade. If South Africa allows the pattern trade to be just like other developing countries the intra-industry trade is set to increase. The beneficial implication of this is that the consensus among producers for protection is weakened. Within industries there will be both losers and gainers from trade liberalization.

CHAPTER EIGHT

SUMMARY AND CONCLUSION

The supply theories trade identifies differences in relative factor endowments and methods of production as the key determinants of trade patterns. There are several variations in the general proposition. Ricardian theory focuses on labour as the relevant factor of production, and suggests that differences in labour productivity exist across commodities, where each commodity has unique method of production ((i.e.) given input of labour). The differences in techniques of production across countries would give rise to differences in relative prices of commodities, thereby forming a basis for trade

In contrast, the Heckscher-Ohlin model in its two-factor version considers both capital and labour and assumes that the same techniques of production for all commodities are available in all countries. It concludes that relative differences in factor endowments between countries create a basis for trade. Evidently, it is relative abundance or scarcity that will imply lower or higher factor costs and consequently lower or higher relative prices of commodities between countries. The Heckscher-Ohlin model reveals that a country should export the commodity that uses relatively intensively the relative abundant factor of production, and import the commodity, which uses relatively intensively the relative scarce factor.

Both, these models however have as part of the analysis perfect competition and constant returns to scale. However these conventional models cannot readily explain trade in manufactures between industrialized countries i.e. deal with the concept of intra-industry trade. New theories have been formulated relaxing the assumption of perfect competition and constant returns to scale in Ricardian and Hechscher-Ohlin models. As regards these new models two developments occurred, namely, one including increasing returns to scale and the other incorporating the Chamberlinian monopolistic competition into the analysis. With these new models, incorporating these alternative assumptions, international trade theory is able to allow for the possibility of intra-industry trade to exist. These new models however have some connection to conventional trade theory.

Intra-industry trade, which is the simultaneous export and import of products from the same product group, is important for at least two reasons. Firstly, accurate measurement of pure intra-industry trade can give some indication of the importance of determinants of international exchange other than relative factor proportions. Secondly, there exists a possibility that adjustment to trade expansion may be easier when the expansion takes the form of an increase in intra- industry trade as opposed to inter-industry trade.

In order to explore the concept of intra-industry trade empirically or to test the models of intra-industry trade, which have emerged in recent years, intra-industry trade has to be measured as accurately as possible. Chapter three discusses the different measures

of intra-industry trade, but the most commonly used index in most empirical analysis of intra-industry trade for all individual industries is the B_i index proposed by Grubel and Lloyd (1975). Several methods of adjusting for trade imbalance have been devised, but there is much debate about which is best and whether any adjustment should be undertaken at all (Aquino, 1981; Greenaway and Milner. 1981, and Greenaway and Milner, 1983). The principal complication with the measurement of intra-industry trade is the unknown influence of categorical aggregation is also discussed in this chapter. To get an overall picture of the level and extent of intra-industry trade, it was concluded that intra-industry trade should be calculated using alternative industries.

Chapter four provides empirical evidence on the levels and trends on intra-industry trade. The chapter begins by providing the reader with the measurement of intra-industry trade of other document studies, before measuring the extent to which intra-industry trade occurs in South Africa using various measures of intra-industry trade. This study assesses the levels of intra-industry trade taking into account the two trades liberalization 'episodes' during the period under review. The results prove that there is substantial intra-industry trade in each industry at both the three-digit and four-digit levels. The levels of intra-industry trade were lower for the first liberalization 'eposide' than the second major liberalization 'episode'. Given that trade liberalization (defined as the creation of a system of incentives biased towards export production for the domestic market) increased growth and structure of South Africa's foreign trade in manufactures from the period 1985-93, it is argued that the

levels of intra-industry trade is in most cases higher for that period. It was reported that $\overline{B}_i$ is an upward bias measure of intra-industry trade and $\overline{C}_i$ is a downward bias measure of intra-industry trade Q_j is either greater or lesser than $\overline{B}_i$ and $\overline{C}_i$. This study concludes that intra-industry trade still exists at a very fine level of aggregation, dismissing the notion that intra-industry trade is merely a statistical artifact and thus any attempt to deal with it theoretically is meaningless as argued by Finger (1975) and Vona (1990). It was noted that the average intra-industry trade (average B_i) for all the manufacturing industries for the period 1972 to 1993 range between 45 per cent to 60 per cent. This is relatively low when compared to industrialized countries suggesting that there is substantial scope for the growth of intra-industry trade. The relatively low level of intra-industry trade confirms Simson (1987) hypothesis. Also noted in this chapter, is that the relatively low levels of intra-industry trade for South Africa and the ROW could be attributed to the wide and high dispersion of levels of protection existent in the South African manufacturing industries. Furthermore it was reported that much of South Africa's intra-industry trade with ROW takes place in capital-intensive sectors. This chapter also concludes that intra-industry trade for South Africa takes place much with its major trading partners than with South Africa and countries in the Southern African region, this could attributed to the differences in *per capita* income levels between South and the countries in the region. Empirical performance of the different indices of intra-industry trade was reported in this chapter. In some cases the Q_i indices were greater than the B_i and other cases less. To analyze the effects of categorical aggregation two methods were adopted in this study, firstly the behaviour of the average B_i indices upon disaggregation (Table 4.5)

were monitored. The average levels of intra-industry trade fell from one digit to the next, confirming the presence of categorical aggregation. Secondly, in order to adjust for the presence of categorical aggregation the C_j index was adopted and reported in this study. The C_j index has one feature, which is advantageous over B_i, in that it is an average of the trade-weighted sub-group indices. It was reported that $B_i \geq C_j$. It is concluded that the interpretation of measured intra-industry trade is undoubtedly complicated by categorical aggregation.

Trade policy reforms currently under way began at the commencement of the Uruguay Round implementation period in January 1995, and scheduled to continue through to the year 2002 in the case of most manufactured goods. In the case of most manufactured goods, they mainly involve the phasing down of tariffs, and phasing out of the General Export Incentive Scheme (GEIS) in January 1997. Import surcharges, which remained, were abolished in 1995. It would be interesting, however to assess the levels and trends of intra-industry trade during this period, especially after South Africa becoming a democratic country after the April 1994 elections. It is perhaps suggested that level of intra-industry trade will be greater for this period than the period under taken in this study.

Chapter five analyses the concept intra-industry trade within a regional framework. In this chapter the different economic integration schemes are discussed within the Southern African region. A brief description of South Africa's trade in the region is given.

Intra-industry trade between SACU and the ROW, South Africa and SACU and countries within the Southern African region as well as SACU and regions of the world were reported in Section 5.10. The conclusions reached is that the intra-industry trade between South Africa and countries in the Southern Africa region as well SACU and countries in the Southern Africa region is relatively low compared to South Africa's trade and its major trading partners. This could be attributed to the levels of development in these countries compared to South Africa or that these countries domestic production is mainly concentrated in primary commodities. It is concluded that South Africa's intra-industry trade with Zimbabwe and Malawi is relatively high when compared to the other countries in the Southern African region. The possible explanation for this could be because of the special trading agreements that exist between South Africa and Zimbabwe, and South Africa and Malawi. This concept is argued by Balassa (1979) that 'intra-industry trade specialization has assumed the greatest importance in countries that have participated in complementarity agreements'.

Balassa's (1979: 258) suggestion that there may be greater scope for intra-industry trade in a regional union among countries which are at lower but more equal levels of development, because industrialization will occur in the framework of a larger market, allowing increased specialization and greater competition, and avoiding the establishment of relatively high-cost industries to serve protected markets national markets, may apply to a subset of SADC countries, as the countries become more

similar through industrialization. Balassa (1979: 266) argues that the ease of adjustment in the case of intra-industry trade specialization, in contrast to the adjustment costs of inter-industry specialization, provides an argument for trade integration between these countries, may apply to a subset of SADC countries, as the countries become more similar through industrialization. Further research into the factor intensity and the trade in the region, the extent and type of product differentiation, and the prospect of exploiting economies of scale in a regional context before a more thorough conclusion can be drawn. Greenaway (1991: 167) notes that, however, that as industrialization proceeds and *per capita* income increases intra-industry trade will become more important in the light of developing countries. Integration in the SADC region could thus be aimed at stimulating intra-industry trade rather than inter-industry trade.

Chapter six discusses the concept of trade policy reform and intra-industry trade. The chapter shows that a lowering of trade barriers encourages intra-industry trade and that there exists a gain from intra-industry trade. Chapter seven analyses the effects of trade policy in South Africa's intra-industry trade. It is argued that when countries are similar in factors of production, both parties tend to gain from trade liberalization and the consequent intra-industry trade posses lesser adjustment problems than in the standard cases. Some support exists for the proposition that intra-industry trade is negatively related with the level and variation of tariff rates. Excessive dispersion of protection between industries amounts to a 'laser beam' approach to the imposition of tariffs by authorities, which distorts trade patterns. It was concluded in this chapter

that there was weak support for influence on tariff structures on intra-industry trade in South Africa.

According to Gunasekera (1989:86), ' a reduction in the relatively high level of variation in protection will facilitate intra-industry adjustment and reduce the number of products in each industry.' South Africa has high and wide dispersions of levels of protection. Given the proposed rounds of trade liberalization to be phased in, it is suggestive that levels of intra-industry trade will increase. In total, the prospective result of trade liberalization for South Africa is one of increased intra-industry trade. If South follows the trade patterns of other developing countries, intra-industry trade is set to be an increasing and important phenomenon. The beneficial implication of this is that the consensus among producers for protection is weakened. Within the industry group there will be both losers and gainers from trade liberalization.

APPENDIX

TABLE:A

SIC CLASSIFICATION AND DESCRIPTION AT THE THREE-DIGIT LEVEL.

ISIC	SECTOR
	RAW MATERIALS (PRIMARY COMMODITIES)
1110	AGRICULTURE
2	MINING
	AVERAGE
	MANUFACTURES
311-312	FOOD
313	BEVERAGES
314	TOBACCO PRODUCTS
321	TEXTILES
322	CLOTHING
323	LEATHER PRODUCTS
324	FOOTWEAR
331	WOOD AND WOOD PRODUCTS
332	FURNITURE
341	PAPER AND PAPER PRODUCTS
342	PRINTING AND PUBLISHING
351-354	CHEMICAL PRODUCTS
355	RUBBER PRODUCTS
356	PLASTIC PRODUCTS
361	POTTERY, CHINA AND EARTHENWARE
362	GLASS AND GLASS PRODUCTS
369	OTHER NON-METALLIC MINERAL PRODUCTS
371	IRON AND STEEL BASIC INDUSTRIES
372	NON-FERROUS METAL BASIC INDUSTRIES
381	METAL PRODUCTS
382	MACHINERY
383	ELECTRICAL MACHINERY
384	MOTOR VEHICLES AND PARTS
385	OTHER TRANSPORT EQUIPMENT
390	OTHER MANUFACTURING INDUSTRIES
9999	UNCLASSIFIED

TABLE: A*
SIC CLASSIFICATION AND DESCRIPTION AT THE FOUR-DIGIT LEVEL.

ISIC	SECTOR
	PRIMARY COMMODITIES
1100	AGRICULTURE
1100	COAL MINING
1100	GOLD MINING
1100	OTHER MINING (DIAMONDS & OTHER)
	MANUFACTURES
3111	SLAUGHTERING
3112	DAIRY PRODUCTS
3113	CANNING & PRESERVING OF FRUIT & VEGETABLES
3114	CANNING
3115	VEGETABLE & ANIMAL OILS & FATS
3116	GRAIN MILL PRODUCTS
3117	BAKERY PRODUCTS
3118	SUGAR FACTORIES & REFINERIES
3119	COCOA
3121	OTHER FOOD PRODUCTS
3122	PREPARED ANIMAL FEEDS
3131	DISTILLERIES & WINERIES
3133	MALT LIQUORS & MALT
3134	SOFT DRINKS & CARBONATED WATERS INDUSTRIES
3140	TOBACCO PRODUCTS
32110	SPINNING
3212	MADE-UP TEXTILE GOODS
32130	GARMENT & HOSIERY KNITTING MILLS
32139	OTHER KNITTING MILLS
3214	CARPETS & RUGS
3215	CORDAGE
3219	TEXTILES
3220	WEARING APPAREL EXCEPT FOOTWEAR
3231	TANNERIES & LEATHER FINISHING
3233	LEATHER PRODUCTS & LEATHER SUBSTITUTES
3240	FOOTWEAR
3310	WOOD & WOOD PRODUCTS
3320	FURNITURE
3411	PULP
3412	PAPER CONTAINERS
3419	OTHER PULP
3420	PRINTING & PUBLISHING
3511	INDUSTRIAL CHEMICALS
3512	FERTILIZERS & PESTICIDES
3513	SYNTHETIC RESINS
3521	PAINTS
3522	MEDICINAL & PHARMACEUTICAL PREPARATIONS
3523	SOAP
3529	OTHER CHEMICAL PRODUCTS

TABLE: A*

SIC CLASSIFICATION AND DESCRIPTION AT THE FOUR-DIGIT LEVEL.

ISIC	SECTOR
353/4	PETROLEUM REFINERIES & PRODUCTS OF PETROLEUM/COAL
3551	TYRES & TUBES
3559	OTHER RUBBER PRODUCTS
3560	OTHER PLASTIC PRODUCTS
3610	POTTERY
3620	GLASS & GLASS PRODUCTS
3691	BRICKS
3692	CEMENT
3699	OTHER NON-METALLIC MINERAL PRODUCTS
3710	IRON & STEEL BASIC INDUSTRIES
3720	NON-FERROUS METAL BASIC INDUSTRIES
3811	CUTLERY
3812	FURNITURE & FIXTURES PRIMARILY OF METAL
3813	STRUCTURAL METAL PRODUCTS
3819	OTHER FABRICATED METAL PRODUCTS
3821	ENGINES & TURBINES
3822	AGRICULTURAL MACHINERY & EQUIPMENT
3823	METAL & WOODWORKING MACHINERY
3824	SPECIAL INDUSTRIAL MACHINERY & EQUIPMENT
3825	OFFICE
3829	OTHER MACHINERY & EQUIPMENT
3831	ELECTRICAL INDUSTRIAL MACHINERY & APPARATUS
3832	RADIO
3833	ELECTRICAL APPLIANCES & HOUSEWARES
3839	OTHER ELECTRICAL APPARATUS & SUPPLIES
38400/1	MOTOR VEHICLES
38402/3/9	MOTOR VEHICLE PARTS & ACCESSORIES
3852	RAILWAY EQUIPMENT
3851/4/5/9	OTHER TRANSPORT
3901	JEWELLERY & RELATED ARTICLES
386/3902/3/9	OTHER MANUFACTURING INDUSTRIES
	SERVICES
4100	ELECTRICITY
4200	WATER SUPPLY
5100	BUILDING CONSTRUCTION
5200/300	CIVIL ENGINEERING & OTHER CONSTRUCTION
61/620/21/22	WHOLESALE & RETAIL TRADE & MOTOR TRADE
6300	CATERING & ACCOMODATION SERVICES
7100	TRANSPORT & STORAGE
7200	COMMUNICATION
81/8200	FINANCIAL INSTITUTIONS & INSURANCE SERVICES
8310	REAL ESTATE
8320	BUSINESS SERVICES
8330	MACHINERY & EQUIPMENT
9330	MEDICAL, DENTAL & OTHER
9700	OTHER SERVICES, PROFIT SEEKING
9800	OTHER SERVICES, NON-PROFIT SEEKING
9900	OTHER

TABLE: A-1

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SA AND ROW (PERCENTAGES) FROM 1972-93 AT CURRENT RANDS.

ISIC	SECTOR	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	ABS CHANGE(72-84)	% CHANGE(72-84)	1985	1986	1987	1988	1989	1990	1991	1992	1993	ABS CHANGE(85-93)	% CHANGE(85-93)	AVERAGE(72-93)
	RAW MATERIALS (PRIMARY COMMODITIES)																											
1110	AGRICULTURE	29	33	41	43	37	29	29	28	32	36	57	79	87	58	200	90	80	75	73	63	69	82	93	93	3	4	58
2	MINING	22	25	34	44	47	38	34	34	36	53	45	32	29	7	31	25	25	26	31	32	29	28	27	26	2	7	33
	AVERAGE	26	29	37	44	42	33	32	31	34	44	51	55	58	32	116	57	52	51	52	48	49	55	60	60	3	6	45
	MANUFACTURES																											
311-31	FOOD	41	42	46	43	41	37	43	43	53	63	69	73	88	47	114	73	71	74	80	77	76	83	89	89	16	21	63
313	BEVERAGES	86	100	83	78	89	96	96	93	98	91	86	85	76	-10	-12	95	98	97	99	92	90	95	99	99	4	5	92
314	TOBACCO PRODUCTS	20	32	47	73	75	82	74	91	97	97	98	96	97	77	380	69	50	39	31	21	33	57	86	86	17	25	66
321	TEXTILES	74	70	63	66	71	80	78	81	74	65	63	65	60	-14	-19	80	90	95	97	92	99	87	76	76	-4	-5	77
322	CLOTHING	87	82	80	70	55	39	35	35	42	49	45	39	39	-48	-55	28	25	25	26	23	35	56	82	82	54	191	49
323	LEATHER PRODUCTS	96	95	83	81	90	99	95	74	59	46	41	36	39	-58	-60	31	35	49	74	97	92	97	93	93	62	203	73
324	FOOTWEAR	50	48	43	44	53	68	69	71	63	55	50	49	41	-10	-19	62	75	84	91	94	79	49	28	28	-33	-54	59
331	WOOD AND WOOD PRODUCTS	27	30	32	39	63	99	79	77	86	95	98	96	84	57	210	99	95	96	99	96	95	99	95	95	-5	-5	81
332	FURNITURE	45	44	46	41	23	11	7	0	0	0	0	0	16	-28	-63	14	15	17	21	22	29	43	59	59	45	324	23
341	PAPER AND PAPER PRODUCTS	64	53	40	35	44	59	63	65	58	53	61	75	81	16	25	95	85	85	91	92	80	74	66	66	-29	-30	67
342	PRINTING AND PUBLISHING	40	42	43	50	35	27	15	17	16	14	14	14	12	-28	-70	15	15	14	12	12	14	14	15	15	0	0	21
351-35	CHEMICAL PRODUCTS	49	45	39	40	50	67	72	68	55	46	48	53	51	2	4	66	72	72	69	74	71	61	55	55	-11	-17	58
355	RUBBER PRODUCTS	96	98	96	96	90	79	83	73	74	74	73	68	72	-24	-25	62	63	70	79	80	70	67	62	62	0	0	77
356	PLASTIC PRODUCTS	51	44	34	31	36	44	42	43	36	31	28	27	22	-29	-58	31	36	38	38	44	45	41	39	39	7	24	37
361	POTTERY, CHINA AND EARTHENW	39	31	23	19	25	36	38	34	24	18	17	18	17	-22	-57	26	32	35	38	46	50	49	50	49	24	91	32
362	GLASS AND GLASS PRODUCTS	39	39	36	39	35	35	26	9	2	0	1	2	4	-35	-90	7	10	13	17	24	29	32	35	35	28	397	21
369	OTHER NON-METALLIC MINERAL	41	37	31	30	44	65	76	75	63	53	48	46	38	-2	-5	60	74	84	92	92	99	86	74	74	14	24	63
371	IRON AND STEEL BASIC INDUSTRI	81	89	98	94	88	68	63	68	83	97	82	67	43	-38	-47	67	78	86	91	93	93	100	95	95	28	43	83
372	NON-FERROUS METAL BASIC IND	99	96	89	91	71	38	23	24	31	38	36	31	31	-68	-69	25	24	26	30	29	25	24	22	22	-3	-11	42
381	METAL PRODUCTS	83	83	88	83	64	44	38	33	35	37	32	25	23	-60	-72	19	20	23	28	28	26	27	27	27	8	41	41
382	MACHINERY	75	70	61	60	60	66	58	64	60	57	49	44	34	-40	-54	51	59	62	63	71	76	75	75	75	24	48	62
383	ELECTRICAL MACHINERY	29	23	17	15	16	18	16	17	15	13	13	14	12	-17	-58	18	21	22	22	25	28	27	27	27	9	49	20
384	MOTOR VEHICLES AND PARTS	25	20	15	13	15	18	17	18	15	13	12	12	11	-14	-57	16	20	22	22	27	29	28	28	28	11	69	19
385	OTHER TRANSPORT EQUIPMENT	13	12	11	12	12	13	11	13	12	11	12	13	13	0	-3	22	28	31	29	30	42	49	57	57	35	162	23
390	OTHER MANUFACTURING INDUST	40	34	27	25	27	31	28	30	27	25	25	27	25	-14	-36	35	39	39	37	40	51	59	69	69	33	94	37
9999	UNCLASSIFIED	79	72	65	71	78	92	92	85	67	53	53	56	52	-28	-35	65	68	68	66	72	56	41	34	34	-30	-47	65
3	MANUFACTURING	56	55	51	52	52	54	51	50	48	46	44	44	41	-15	-9	47	50	53	55	57	58	58	59	59	12	63	52
	AVERAGE(manu+raw materials)	52	52	49	50	50	51	48	47	46	46	45	44	43	-9	5	48	50	52	55	56	57	59	60	60	12	61	51

SOURCE: OWN COMPUTATIONS FROM IDC (1996).

NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) B_i INDEX.

TABLE: A-2

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SA AND ROW (PERCENTAGES) FOR 1972-93 AT CURRENT RANDS.

ISIC	SECTOR	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	ABS CHANGE(72-84)	% CHANGE(72-84)	1985	1986	1987	1988	1989	1990	1991	1992	1993	ABS CHANGE(85-93)	% CHANGE(85-93)
	RAW MATERIALS(PRIMARY COMMODITIES)																										
1100	AGRICULTURE	29	33	41	43	37	29	29	28	32	36	57	79	87	58	200	90	80	75	73	63	69	82	93	93	3	4
2100	COAL MINING	11	15	20	23	10	4	2	1	0	0	0	0	0	-11		0	0	0	0	1	0	0	0	0	0	
2400	GOLD MINING	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	0	0	0	0	0	0	0	0	0	0	
2800	OTHER MINING (DIAMONDS & OTHER)	57	72	92	97	91	75	74	85	91	69	82	100	90	33	58	75	73	75	81	78	66	61	55	55	-20	-27
	AVERAGE	24	30	38	41	34	27	26	28	31	26	35	45	44	20	95	41	38	38	38	36	34	36	37	37	-4	-12
	MANUFACTURES																										
3111	SLAUGHTERING	45	52	63	66	51	36	32	34	45	58	56	51	53	8	17	46	48	55	64	67	68	75	81	81	35	77
3112	DAIRY PRODUCTS	45	62	78	95	82	65	63	69	87	95	92	93	84	40	88	91	84	73	60	55	65	70	76	76	-15	-16
3113	CANNING & PRESERVING OF FRUIT & VEGETABL	11	12	14	14	12	9	10	10	14	18	19	19	22	11	92	16	14	14	15	13	18	26	37	37	22	138
3114	CANNING	57	46	40	29	35	40	57	74	96	67	73	83	85	28	49	91	84	73	60	54	74	89	93	93	2	3
3115	VEGETABLE & ANIMAL OILS & FATS	59	62	69	67	58	46	46	44	50	56	80	98	68	9	15	78	77	71	62	61	63	58	56	56	-23	-29
3116	GRAIN MILL PRODUCTS	84	75	70	57	77	94	74	81	77	73	62	55	42	-42	-50	60	69	74	77	88	88	81	76	76	17	28
3117	BAKERY PRODUCTS	89	71	52	42	56	76	84	77	60	46	0	0	-7	-96		0	0	0	0	79	73	74	72	72	72	
3118	SUGAR FACTORIES & REFINERIES	7	9	13	16	13	10	10	10	12	14	17	18	22	16	238	16	15	16	17	16	17	21	25	25	9	52
3119	COCOA	50	44	36	34	46	65	73	70	57	46	43	43	37	-13	-27	55	66	73	78	91	99	97	92	92	37	68
3121	OTHER FOOD PRODUCTS	84	91	94	94	86	74	77	72	78	83	95	97	80	-4	-5	93	92	86	78	77	81	77	75	75	-17	-19
3122	PREPARED ANIMAL FEEDS	8	7	7	6	11	20	46	42	46	49	83	83	46	38	510	66	77	83	87	99	68	37	19	19	-47	-71
3131	DISTILLERIES & WINERIES	79	94	87	78	85	96	93	95	86	77	74	75	67	-12	-15	85	91	92	90	97	95	85	78	78	-8	-9
3133	MALT LIQUORS & MALT	71	64	54	52	65	85	91	94	86	79	73	72	62	-9	-13	80	86	86	84	91	100	98	94	94	15	18
3134	SOFT DRINKS & CARBONATED WATERS INDUSTR	82	66	54	37	0	0	0	0	0	0	0	0	0	-82		0	0	0	0	0	0	0	4	4	4	
3140	TOBACCO PRODUCTS	20	32	47	73	75	82	74	91	97	97	98	96	97	77	380	69	50	39	31	21	33	57	86	86	17	25
32110	SPINNING	84	78	69	69	71	78	71	74	66	60	56	56	49	-35	-42	69	81	88	92	95	98	91	83	83	14	20
3212	MADE-UP TEXTILE GOODS	41	56	71	97	91	90	74	74	63	54	58	66	66	25	63	85	92	94	93	100	87	67	51	51	-34	-40
32130	GARMENT & HOSIERY KNITTING MILLS	30	16	8	5	12	29	51	57	54	51	56	64	65	36	121	90	96	88	83	71	79	96	90	90	-1	-1
32139	OTHER KNITTING MILLS	44	39	31	29	0	0	0	0	0	87	98	87	81	37	83	69	69	74	82	82	99	77	57	57	-12	-18
3214	CARPETS & RUGS	24	23	21	22	41	75	99	96	79	64	68	75	75	51	216	81	76	66	54	50	66	77	91	91	10	12
3215	CORDAGE	54	47	44	35	39	40	51	35	28	22	26	28	35	-19	-35	30	31	36	42	44	64	95	74	74	45	152
3216	TEXTILES	46	44	39	40	58	86	100	92	95	98	91	85	70	24	52	91	99	97	97	88	79	45	24	24	-67	-74
3220	WEARING APPAREL EXCEPT FOOTWEAR	87	82	80	70	55	39	35	35	42	49	45	39	39	-48	-55	28	25	25	26	23	35	56	82	82	54	191
3231	TANNERIES & LEATHER FINISHING	81	89	100	98	98	96	94	71	51	34	25	17	13	-68	-84	17	27	46	75	99	93	93	91	91	74	439
3233	LEATHER PRODUCTS & LEATHER SUBSTITUTES	29	30	28	32	51	83	97	99	84	70	60	54	42	13	45	73	99	80	63	43	75	78	41	41	-33	-45
3240	FOOTWEAR	50	48	43	44	53	68	69	71	63	55	50	49	41	-10	-19	62	75	84	91	94	79	49	28	28	-33	-54
3310	WOOD & WOOD PRODUCTS	27	30	32	39	63	99	79	77	86	95	98	96	84	57	210	99	95	96	99	96	95	99	95	95	-5	-5
3320	FURNITURE	45	44	46	41	23	11	7	0	0	0	0	0	16	-28	-63	14	15	17	21	22	29	43	59	59	45	324
3411	PULP	65	53	39	33	44	60	65	68	61	56	65	78	84	18	28	88	74	65	60	48	38	35	30	30	-58	-66
3412	PAPER CONTAINERS	30	30	32	29	25	19	20	27	42	61	61	57	60	31	104	41	33	29	26	21	22	28	32	33	-8	-20

TABLE: A-2

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SA AND ROW (PERCENTAGES) FOR 1972-93 AT CURRENT RANDS.

ISIC	SECTOR	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	ABS CHANGE(72-84)	% CHANGE(72-84)	1985	1986	1987	1988	1989	1990	1991	1992	1993	ABS CHANGE(85-93)	% CHANGE(85-93)
3419	OTHER PULP	29	20	12	9	13	19	22	6	1	0	1	2	6	-22	-78	8	7	6	4	4	8	14	24	24	16	215
3420	PRINTING & PUBLISHING	40	42	43	50	35	27	15	17	16	14	14	14	12	-28	-70	15	15	14	12	12	14	14	15	15	0	0
3511	INDUSTRIAL CHEMICALS	38	40	39	44	57	76	83	80	67	55	58	64	63	25	66	81	87	88	86	93	87	73	63	63	-18	-22
3512	FERTILIZERS & PESTICIDES	99	93	80	77	97	68	56	72	98	69	82	100	91	-8	-8	75	71	73	77	74	70	73	74	74	-1	-2
3513	SYNTHETIC RESINS	18	15	12	10	13	17	17	21	21	22	27	35	40	22	117	48	47	42	36	36	39	38	38	38	-10	-20
3521	PAINTS	92	94	76	67	69	76	68	68	58	49	37	30	20	-71	-78	32	39	44	47	57	60	57	56	56	24	75
3522	MEDICINAL & PHARMACEUTICAL PREPARATIONS	68	55	40	34	41	53	55	61	57	55	50	49	41	-27	-39	54	57	56	53	57	42	27	17	17	-37	-68
3523	SOAP	51	64	74	94	78	67	45	58	63	68	60	56	45	-5	-10	64	73	78	80	90	94	89	87	87	23	36
3529	OTHER CHEMICAL PRODUCTS	62	53	43	40	41	46	40	43	38	34	28	24	18	-44	-71	26	29	29	28	32	35	34	34	34	8	32
353/4	PETROLEUM REFINERIES & PRODUCTS OF PETR	96	98	96	96	90	79	83	73	74	74	73	68	72	-24	-25	62	63	70	79	80	70	67	62	62	0	0
3551	TYRES & TUBES	49	46	40	41	54	73	81	74	58	44	39	38	31	-18	-37	45	53	57	58	68	68	62	59	59	14	31
3559	OTHER RUBBER PRODUCTS	53	42	31	26	26	27	23	26	24	22	19	19	15	-38	-72	21	24	25	24	27	27	23	20	20	-1	-5
3560	OTHER PLASTIC PRODUCTS	39	31	23	19	25	36	38	34	24	18	17	18	17	-22	-57	26	32	35	38	46	50	49	50	49	24	91
3610	POTTERY	39	39	36	39	35	35	26	9	2	0	1	2	4	-35	-90	7	10	13	17	24	29	32	35	35	28	397
3620	GLASS & GLASS PRODUCTS	41	37	31	30	44	65	76	75	63	53	48	46	38	-2	-5	60	74	84	92	92	99	86	74	74	14	24
3691	BRICKS	88	62	38	26	40	63	77	80	73	66	51	42	28	-60	-68	36	37	35	31	32	34	32	31	31	-6	-16
3692	CEMENT	69	88	97	73	60	45	43	67	92	54	0	0	-47			0	0	0	0	57	70	76	84	84	84	
3699	OTHER NON-METALLIC MINERAL PRODUCTS	66	75	89	94	71	47	39	40	49	59	72	82	98	32	48	74	60	52	47	37	40	50	59	59	-16	-21
3710	IRON & STEEL BASIC INDUSTRIES	99	96	89	91	71	38	23	24	31	38	36	31	31	-68	-69	25	24	26	30	29	25	24	22	22	-3	-11
3720	NON-FERROUS METAL BASIC INDUSTRIES	83	83	88	83	64	44	38	33	35	37	32	25	23	-60	-72	19	20	23	28	28	26	27	27	27	8	41
3811	CUTLERY	58	59	56	62	51	45	31	28	21	16	16	18	17	-40	-70	25	28	29	29	33	33	30	28	28	3	10
3812	FURNITURE & FIXTURES PRIMARILY OF METAL	23	16	10	8	19	47	80	59	34	19	12	8	5	-18	-80	15	33	63	100	56	65	82	97	97	83	565
3813	STRUCTURAL METAL PRODUCTS	97	97	92	97	84	76	55	66	67	69	55	46	32	-65	-67	56	76	93	93	71	69	74	77	77	20	36
3819	OTHER FABRICATED METAL PRODUCTS	85	75	61	57	62	72	69	77	75	74	63	56	44	-42	-49	59	65	67	66	73	78	77	78	78	19	32
3821	ENGINES & TURBINES	14	16	16	20	14	11	6	6	5	4	4	5	5	-9	-61	10	13	17	19	26	21	15	10	10	1	7
3822	AGRICULTURAL MACHINERY & EQUIPMENT	13	11	10	10	12	15	14	13	9	6	7	7	7	-6	-45	12	15	18	20	26	32	34	38	38	26	222
3823	SPECIAL INDUSTRIAL MACHINERY & EQUIPMENT	19	14	9	7	11	19	23	22	17	14	15	18	18	-1	-5	27	32	35	35	41	42	38	35	35	8	29
3824	OFFICE	35	29	22	19	19	20	16	19	17	17	17	18	16	-19	-54	23	25	24	23	25	29	29	31	31	8	36
3825	OTHER MACHINERY & EQUIPMENT	14	13	11	11	10	10	8	8	7	6	6	8	8	-6	-44	10	10	9	8	8	10	11	13	13	3	31
3829	ELECTRICAL INDUSTRIAL MACHINERY & APPARA	36	27	19	15	17	22	21	23	20	18	15	14	11	-25	-69	17	21	23	24	29	32	31	31	31	14	82
3831	RADIO	22	18	14	13	14	17	15	17	16	15	14	13	11	-11	-49	18	22	25	26	32	33	29	27	27	9	49
3832	ELECTRICAL APPLIANCES & HOUSEWARES	17	13	9	7	9	12	13	12	10	8	8	8	8	-9	-54	12	13	14	14	16	19	20	22	22	10	87
3833	OTHER ELECTRICAL APPARATUS & SUPPLIES	33	28	23	22	23	27	24	24	20	17	16	16	14	-19	-59	22	27	31	33	41	37	30	25	25	3	16
3839	MOTOR VEHICLES	38	33	27	26	28	33	30	32	27	24	21	20	16	-22	-59	25	31	35	38	47	47	42	39	38	14	55
38400/	MOTOR VEHICLE PARTS & ACCESSORIES	28	25	20	19	25	34	36	46	49	53	56	64	64	35	125	68	62	52	40	36	52	66	84	84	15	22
38402/	RAILWAY EQUIPMENT	8	8	7	8	7	7	5	5	4	3	3	4	4	-4	-52	6	8	9	9	12	17	21	28	28	22	364
3852	OTHER TRANSPORT	18	16	14	14	14	17	15	18	17	18	15	14	11	-6	-36	23	36	50	64	89	86	70	53	53	30	130
3851/4/	JEWELLERY & RELATED ARTICLES	45	39	31	28	30	34	30	32	29	26	27	30	28	-17	-38	37	39	38	35	37	48	54	63	63	26	72

TABLE: A-2

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SA AND ROW (PERCENTAGES) FOR 1972-93 AT CURRENT RANDS.

ISIC	SECTOR	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	ABS CHANGE(72-84)	% CHANGE(72-84)	1985	1986	1987	1988	1989	1990	1991	1992	1993	ABS CHANGE(85-93)	% CHANGE(85-93)
3901	OTHER MANUFACTURING INDUSTRIES	79	58	43	27	18	11	9	12	21	34	30	25	25	-54	-68	11	6	3	2	1	3	8	21	21	10	96
	AVERAGE (MANUFACTURES)	50	47	44	43	43	46	46	47	45	43	42	42	37	-11	7	44	47	48	49	52	54	53	53	53	9	58
	SERVICES																										
	ELECTRICITY																										
4100	WATER SUPPLY	0	0	0	0		0	90	99	96	94	46	13	4	4		3	3	3	4	4	0	0	0	0	-3	-100
4200	BUILDING CONSTRUCTION														0											0	
5100	CIVIL ENGINEERING & OTHER CONSTRUCTION	0	0	0		0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	
5200/3	WHOLESALE & RETAIL TRADE & MOTOR TRADE	63	53	41	37	49	68	76	82	77	74	76	82	79	16	26	92	93	88	80	81	72	57	46	46	-46	-50
61/620/	CATERING & ACCOMODATION SERVICES	2	2	2	2	2	2	2	2	3	5	5	5	5	3	217	4	4	4	3	2	3	3	4	4	0	-9
6300	TRANSPORT & STORAGE	90	72	55	41	47	52	61	58	51	42	50	55	58	-32	-35	62	59	62	63	78	64	54	44	42	-20	-33
7100	COMMUNICATION	91	92	92	92	99	91	79	80	85	93	92	95	99	8	9	100	90	87	83	93	95	99	95	98	-1	-1
7200	FINANCIAL INSTITUTIONS & INSURANCE SERVICE	50	57	63	70	61	51	46	38	28	20	28	36	45	-6	-11	49	47	51	53	68	54	45	36	34	-15	-30
81/820	REAL ESTATE	88	93	97	99	85	67	56	65	70	72	79	81	82	-6	-6	89	86	92	95	87	97	83	70	67	-21	-24
8310	BUSINESS SERVICES	0	0	0	10	12	14	17	18	17	15	19	22	24	24		28	28	32	36	49	36	28	20	19	-9	-31
8320	MACHINERY & EQUIPMENT	27	24	21	19	21	22	25	29	30	29	31	30	28	1	6	35	38	45	52	73	52	37	25	24	-12	-33
8330	MEDICAL, DENTAL & OTHER HEALTH														0											0	
9330	OTHER SERVICES, PROFIT SEEKING							20	21	20	18	24	28	32	32		36	36	39	42	56	47	41	34	33	-4	-10
9700	OTHER SERVICES, NON-PROFIT SEEKING	26	44	68	98	66	43	27	26	22	18	23	28	33	7	26	35	33	34	35	44	38	34	30	29	-6	-18
9800	OTHER							0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	
9900		27	25	23	21										-27						0					0	
	AVERAGE BT (SERVICES)	39	38	38	44	44	37	38	40	38	37	36	37	38	2	29	41	40	41	42	45	43	37	31	30	-9	-31

Source: Own computations from IDC.

Note: These results were obtained using the Grubel-Lloyd (1975) Bi index

TABLE:A-3

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SA AND ROW (PERCENTAGES) FOR 1972-93 AT CURRENT RANDS.

ISIC	SECTOR	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	ABS CHANGE (72-84)	% CHANGE(72-84)	1985	1986	1987	1988	1989	1990	1991	1992	1993	ABS CHANGE (85-93)	% CHANGE(85-93)
	RAW MATERIALS(PRIMARY COMMODITIES)																										
1110	AGRICULTURE	33	38	40	40	36	86	38	38	42	36	59	91	80	47	143	89	97	96	86	75	85	97	93	25	-64	-260.5
2	MINING	25	28	33	41	46	88	44	46	47	53	46	39	33	8	31	36	37	38	39	41	39	36	34	10	-26	-271.7
	AVERAGE	29	33	37	41	41	87	41	42	44	44	53	65	56	27	87	62	67	67	63	58	62	67	63	17	-45	-266
	MANUFACTURING INDUSTRIES																										
11-312	FOOD	46	47	45	40	40	88	55	58	67	63	72	85	95	49	106	94	94	96	94	91	93	98	97	32	-62	-196.2
313	BEVERAGES	93	92	84	82	91	90	88	88	82	91	83	73	69	-24	-26	74	78	81	87	95	93	89	87	9	-65	-757.8
314	TOBACCO PRODUCTS	93	92	84	82	91	90	88	88	82	91	83	73	69	-24	-26	74	78	81	87	95	93	89	87	9	-65	-757.8
321	TEXTILES	18	29	47	78	77	78	60	72	80	97	99	92	90	72	407	90	70	54	39	27	44	71	100	4	-85	-2085
322	CLOTHING	67	63	64	70	73	77	63	63	59	65	61	55	54	-13	-20	60	68	74	83	94	83	72	63	19	-42	-220.7
323	LEATHER PRODUCTS	94	89	80	66	54	89	45	47	54	49	47	48	44	-50	-53	41	38	36	33	29	46	70	96	17	-23	-134.4
324	FOOTWEAR	96	88	84	85	92	88	80	93	73	46	43	44	43	-53	-55	44	51	67	88	89	91	87	79	12	-31	-255.3
331	WOOD AND WOOD PRODUCTS	45	43	43	47	54	69	56	54	49	55	48	40	36	-9	-20	45	55	64	77	92	63	38	22	19	-26	-137.6
332	FURNITURE	24	27	32	42	65	87	94	96	97	95	96	83	77	53	223	80	82	82	85	90	88	83	81	3	-77	-2650
341	PAPER AND PAPER PRODUCTS	50	49	45	39	22	81	9	0	0	0	0	0	19	-31	-62	20	22	25	27	29	39	55	71	3	-18	-650.2
342	PRINTING AND PUBLISHING	58	47	40	38	45	63	50	49	45	53	59	64	74	16	27	84	91	94	95	94	97	89	79	4	-79	-1780
51-354	CHEMICAL PRODUCTS	35	38	43	53	36	35	11	12	11	14	13	11	10	-25	-70	10	10	9	9	9	10	11	12	36	26	71.606
355	RUBBER PRODUCTS	56	54	56	62	69	79	70	68	63	72	70	65	64	8	14	66	66	65	67	70	66	61	59	9	-57	-665.9
356	PLASTIC PRODUCTS	46	39	35	34	37	51	32	31	28	31	27	21	19	-27	-58	22	24	26	30	35	34	32	31	10	-11	-112.1
361	POTTERY, CHINA AND EARTHENWAR	34	27	23	21	26	43	30	24	18	18	17	15	14	-20	-58	18	21	24	30	37	38	38	40	6	-12	-197.1
362	GLASS AND GLASS PRODUCTS	34	34	36	42	36	42	20	6	1	0	1	2	3	-31	-91	5	7	9	13	19	22	24	28	10	6	55.39
369	OTHER NON-METALLIC MINERAL PR	36	32	31	32	45	67	62	57	49	52	46	38	34	-2	-6	43	54	64	78	95	84	71	61	7	-37	-547
371	IRON AND STEEL BASIC INDUSTRI	88	97	98	98	87	99	77	86	99	97	80	57	38	-50	-57	49	57	66	77	93	90	84	81	13	-36	-282.9
372	NON-FERROUS METAL BASIC INDUS	92	89	90	96	70	88	31	34	40	38	37	38	35	-57	-62	35	36	38	38	37	33	31	28	4	-31	-702.4
381	METAL PRODUCTS	90	91	87	79	63	90	49	46	46	37	33	31	26	-64	-71	28	30	33	35	36	35	35	34	4	-24	-672.7
382	MACHINERY	68	63	61	64	62	68	46	48	47	57	47	36	31	-38	-55	36	41	45	51	59	61	61	62	10	-26	-252.9
383	ELECTRICAL MACHINERY	25	20	17	16	16	25	12	12	11	13	12	11	11	-15	-58	12	14	15	17	20	20	20	21	13	1	9.1211
384	MOTOR VEHICLES AND PARTS	22	17	15	14	15	25	13	13	11	13	12	10	9	-13	-58	11	13	15	17	21	22	21	22	10	-1	-11.26
385	OTHER TRANSPORT EQUIPMENT	11	11	11	13	12	19	8	9	9	11	11	10	11	0	-3	15	19	21	23	24	31	38	47	3	-12	-392.9
390	OTHER MANUFACTURING INDUSTRIE	35	30	27	27	28	39	21	21	20	25	24	22	22	-13	-36	24	26	27	29	32	39	46	57	9	-15	-161.5
	AVERAGE	54	52	51	53	52	67	47	47	46	47	45	41	40	-14	-7	43	46	48	52	56	57	57	58	11	-32	-539
	AVERAGE(MANU+RAW MAT)	52	51	50	52	51	68	46	47	46	47	45	43	41	-11	0	45	47	50	53	57	57	57	58	11	-33	-519

SOURCE: OWN COMPUTATIONS FROM IDC (1990)

NOTE: THESE RESULTS WERE OBTAINED USING THE AQUINO (1979) Qí INDEX.

TABLE:A-4

INDICES FOR INTRA-INDUSTRY TRADE BETWEEN SA AND ROW (PERCENTAGES) FOR 1972-93 AT CURRENT RANDS.

ISIC	SECTOR	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	ABS CHANGE(72-84)	% CHANGE (72-84)	1985	1986	1987	1988	1990	1991	1992	1992	1993	ABS CHANGE(85-93)	% CHANGE (85-93)
	RAW MATERIALS (PRIMARY COMMODITIES)																										
1100	AGRICULTURE	88	86	90	98	86	55	92	89	93	78	86	49	29	-84	-67	34	40	44	51	62	53	43	38	37	3	7
1100	COAL MINING	62	69	14	63	30	61	9	3	1	0	0	0	0	-58	-100	0	0	0	0	6	0	0	0	0	0	
1100	GOLD MINING	0	0	0	0	0	62	0	0	0	0	0	0	0	4	-24	0	0	0	0	0	0	0	0	0	0	
1100	OTHER MINING (DIAMONDS & OTHER)	50	42	72	42	52	44	52	42	31	22	34	35	42	-46	-15	44	45	44	45	48	55	60	70	69	25	57
	AVERAGE-PRI. COMM.	50	49	44	51	42	56	38	33	31	25	30	21	18	-46	-64	20	21	22	24	29	27	26	27	26	7	35
	MANUFACTURES																										
3111	SLAUGHTERING	26	46	29	32	27	53	100	22	25	29	28	28	27	-22	5	31	36	41	46	51	54	57	60	60	29	93
3112	DAIRY PRODUCTS	73	69	74	52	48	61	74	48	55	63	66	70	74	-69	2	86	97	92	81	71	80	90	99	99	13	15
3113	CANNING & PRESERVING OF FRUIT & VEGETABL	6	11	6	6	6	47	57	6	7	8	8	9	10	-2	69	10	10	10	10	9	13	18	25	25	15	151
3114	CANNING	33	41	17	12	18	54	53	52	70	90	85	79	74	-29	121	86	97	91	80	71	90	90	71	71	-14	-17
3115	VEGETABLE & ANIMAL OILS & FATS	35	55	33	33	31	56	35	29	28	28	44	65	91	-31	162	98	95	89	83	78	78	77	76	76	-22	-23
3116	GRAIN MILL PRODUCTS	54	68	34	27	44	72	21	94	88	83	97	89	76	-50	42	81	87	93	99	94	96	98	99	99	18	22
3117	BAKERY PRODUCTS	77	78	97	82	92	87	33	98	93	84	0	0	-18	-73	-124	0	0	0	0	62	59	56	53	53	53	
3118	SUGAR FACTORIES & REFINERIES	3	8	5	7	6	48	66	6	6	6	7	9	10	1	202	11	11	11	11	11	13	14	17	17	6	57
3119	COCOA	79	49	73	70	80	95	21	94	89	84	78	73	68	-75	-14	76	83	92	99	90	83	76	70	70	-6	-7
3121	OTHER FOOD PRODUCTS	82	99	60	51	51	64	84	51	48	45	55	66	78	-78	-5	84	89	95	100	96	97	98	98	98	14	17
3122	PREPARED ANIMAL FEEDS	4	6	3	2	5	50	37	27	26	24	46	79	82	0	2016	88	95	98	90	82	83	51	29	29	-59	-67
3131	DISTILLERIES & WINERIES	50	86	65	75	76	76	19	80	80	79	83	88	92	-46	86	91	90	89	87	85	89	94	100	100	8	9
3133	MALT LIQUORS & MALT	95	71	99	95	96	82	13	81	79	78	84	91	97	-91	2	97	96	95	93	90	84	78	72	72	-25	-26
3134	SOFT DRINKS & CARBONATED WATERS INDUSTRI	52	59	24	16	0		0	0	0	0	0	0	0	-48	-100	0	0	0	0	0	0	0	3	3	3	
3140	TOBACCO PRODUCTS	36	37	89	80	86	84	19	84	69	56	58	60	63	-32	72	49	38	28	21	15	25	41	65	65	15	31
32110	SPINNING	82	86	83	85	90	86	23	98	100	99	96	91	85	-78	4	92	99	93	85	77	82	88	94	94	2	2
3212	MADE-UP TEXTILE GOODS	67	63	81	58	70	80	13	98	97	95	99	97	93	-63	39	92	90	87	84	81	97	87	70	70	-21	-23
32130	GARMENT & HOSIERY KNITTING MILLS	51	19	20	12	24	66	15	80	85	90	96	99	94	-47	84	86	78	70	62	54	64	75	87	87	1	1
32139	OTHER KNITTING MILLS	72	44	66	62	0		18	0	0	70	61	53	45	-68	-37	50	54	57	61	64	83	97	77	77	28	56
3214	CARPETS & RUGS	42	26	47	48	73	88	47	79	86	93	90	87	84	-38	101	95	94	83	74	65	81	98	86	86	-9	-10
3215	CORDAGE	31	42	19	15	20	54	97	23	15	10	12	14	17	-27	-46	20	23	26	29	33	51	75	97	97	77	396
3219	TEXTILES	74	49	78	78	95	82	41	68	62	57	67	78	89	-70	20	86	82	79	75	70	95	62	36	36	-50	-59
3220	WEARING APPAREL EXCEPT FOOTWEAR	56	74	40	35	29	54	89	22	23	24	22	20	19	-52	-66	19	18	18	17	16	26	41	61	61	43	229
3231	TANNERIES & LEATHER FINISHING	51	81	55	58	64	73	24	50	29	16	11	8	6	-47	-89	11	20	34	55	82	78	73	69	69	58	536
3233	LEATHER PRODUCTS & LEATHER SUBSTITUTES	50	34	61	65	87	83	10	76	81	87	99	88	76	-46	52	96	83	63	45	31	61	98	57	57	-39	-40
3240	FOOTWEAR	80	54	84	84	89	94	13	96	96	96	89	81	74	-76	-7	83	93	97	86	75	95	66	42	42	-42	-50

TABLE:A-4

INDICES FOR INTRA-INDUSTRY TRADE BETWEEN SA AND ROW (PERCENTAGES) FOR 1972-93 AT CURRENT RANDS.

ISIC	SECTOR	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	ABS CHANGE(72-84)	% CHANGE (72-84)	1985	1986	1987	1988	1990	1991	1992	1992	1993	ABS CHANGE(85-93)	% CHANGE (85-93)
3310	WOOD & WOOD PRODUCTS	47	35	67	77	99	75	21	55	55	55	61	68	75	-43	58	76	77	78	78	78	79	81	83	83	7	9
3320	FURNITURE	25	39	20	18	11	48	38	0	0	0	0	0	7	-21	-71	9	10	12	14	16	22	30	41	41	33	369
3411	PULP	98	59	79	68	76	100	20	92	95	97	94	84	75	-94	-24	66	58	50	42	35	29	24	20	20	-46	-70
3412	PAPER CONTAINERS	16	26	13	12	12	49	100	17	23	31	31	31	31	-12	94	27	24	20	17	15	17	19	22	22	-6	-20
3419	OTHER PULP	50	23	30	22	26	49	11	10	3	1	2	5	14	-46	-71	12	10	8	7	6	11	20	35	35	24	197
3420	PRINTING & PUBLISHING	66	48	84	92	65	62	6	27	29	32	29	28	26	-62	-61	23	21	19	18	17	19	21	23	23	0	-1
3511	INDUSTRIAL CHEMICALS	64	45	78	84	93	87	23	95	99	96	98	99	97	-60	52	96	95	93	91	89	97	94	84	84	-11	-12
3512	FERTILIZERS & PESTICIDES	66	100	72	76	60	62	90	51	68	88	76	64	53	-62	-20	54	56	56	57	57	56	55	54	54	-1	-1
3513	SYNTHETIC RESINS	33	17	28	25	26	45	8	33	39	45	54	63	73	-29	120	67	61	56	52	48	50	53	55	55	-13	-19
3521	PAINTS	60	99	76	87	92	88	17	92	90	88	71	55	42	-56	-30	47	52	59	66	73	75	75	76	76	29	63
3522	MEDICINAL & PHARMACEUTICAL PREPARATIONS	99	61	80	69	73	95	12	84	90	96	89	82	76	-95	-23	74	74	73	73	74	54	38	26	26	-48	-65
3523	SOAP	80	70	78	60	83	94	11	81	96	89	99	91	81	-76	1	86	91	97	97	91	90	90	90	90	4	5
3529	OTHER CHEMICAL PRODUCTS	94	60	84	78	73	87	8	62	64	66	55	46	38	-90	-60	38	39	40	41	43	45	47	49	49	10	27
353/4	PETROLEUM REFINERIES & PRODUCTS OF PETRO	71	94	58	52	54	66	54	51	45	39	39	39	39	-67	-45	44	49	53	58	62	56	50	44	44	0	1
3551	TYRES & TUBES	78	52	80	80	90	89	10	99	90	81	74	66	59	-74	-24	63	68	73	79	85	84	82	79	79	16	25
3559	OTHER RUBBER PRODUCTS	83	47	65	55	49	63	6	39	43	46	41	36	32	-79	-62	32	33	34	36	38	35	33	30	30	-2	-6
3560	OTHER PLASTIC PRODUCTS	64	35	50	44	49	75	6	51	44	38	37	36	35	-60	-46	39	43	48	54	60	63	66	69	69	30	78
3610	POTTERY	65	44	74	78	65	74	5	14	4	1	2	4	9	-61	-87	11	15	19	25	33	38	44	51	51	39	355
3620	GLASS & GLASS PRODUCTS	67	41	65	63	76	95	22	100	96	93	85	78	71	-63	6	81	92	97	85	73	83	93	96	96	15	18
3691	BRICKS	78	69	77	56	71	97	26	95	93	91	90	72	56	-74	-29	52	50	48	46	44	44	45	44	44	-8	-15
3692	CEMENT	98	95	53	37	33	55	37	46	74	94	0	0	57	-94	-42	0	0	0	0	74	85	96	93	93	93	
3699	OTHER NON-METALLIC MINERAL PRODUCTS	40	68	46	51	40	56	66	26	28	29	38	49	62	-36	56	54	46	39	32	27	31	36	42	42	-12	-23
3710	IRON & STEEL BASIC INDUSTRIES	68	96	64	63	40	54	71	15	17	18	17	16	15	-64	-78	16	17	19	20	21	18	16	14	14	-2	-10
3720	NON-FERROUS METAL BASIC INDUSTRIES	53	76	46	43	35	55	43	21	19	17	15	13	11	-49	-80	12	14	16	18	20	19	19	18	18	6	45
3811	CUTLERY	89	65	98	93	86	87	11	43	38	34	35	36	36	-85	-59	37	39	40	42	44	43	42	40	40	3	8
3812	FURNITURE & FIXTURES PRIMARILY OF METAL	41	19	25	19	38	89	56	82	59	41	27	17	10	-37	-74	22	45	80	78	42	52	62	75	75	52	233
3813	STRUCTURAL METAL PRODUCTS	70	96	61	58	77	88	30	90	99	87	95	78	62	-66	-11	77	94	88	71	55	55	56	56	56	-21	-27
3819	OTHER FABRICATED METAL PRODUCTS	81	82	92	99	100	90	15	98	90	83	96	91	79	-77	-2	80	82	85	88	91	94	98	100	100	19	24
3821	ENGINES & TURBINES	26	18	38	45	29	31	3	10	9	9	10	11	12	-22	-53	15	19	23	29	36	28	21	16	16	1	6
3822	AGRICULTURAL MACHINERY & EQUIPMENT	23	13	24	24	24	40	14	20	17	15	15	15	15	-19	-34	18	21	25	30	36	41	47	54	54	36	196
3823	METAL & WOODWORKING MACHINERY	35	16	23	18	23	48	7	35	32	30	32	35	38	-31	9	41	44	47	51	55	54	52	51	51	10	25
3824	SPECIAL INDUSTRIAL MACHINERY & EQUIPMENT	60	33	49	44	38	51	9	29	32	36	35	35	34	-56	-43	34	34	34	34	35	38	41	45	45	11	31
3825	OFFICE	26	15	27	26	21	30	2	13	13	13	15	16	18	-22	-33	16	14	13	12	11	14	17	20	20	4	28

TABLE:A-4

INDICES FOR INTRA-INDUSTRY TRADE BETWEEN SA AND ROW (PERCENTAGES) FOR 1972-93 AT CURRENT RANDS.

ISIC	SECTOR	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	ABS CHANGE(72-84)	% CHANGE (72-84)	1985	1986	1987	1988	1990	1991	1992	1992	1993	ABS CHANGE(85-93)	% CHANGE (85-93)
3829	OTHER MACHINERY & EQUIPMENT	61	31	43	34	35	54	5	35	37	38	33	28	24	-57	-61	26	29	32	36	40	42	44	46	46	19	73
3831	ELECTRICAL INDUSTRIAL MACHINERY & APPARA	39	21	34	31	29	44	9	27	30	32	29	27	24	-35	-38	27	30	34	39	44	42	41	39	39	12	43
3832	RADIO	31	15	21	17	19	34	2	20	19	18	18	17	17	-27	-44	18	19	20	21	23	26	29	32	32	14	80
3833	ELECTRICAL APPLIANCES & HOUSEWARES	56	32	51	49	45	62	4	37	37	37	34	31	29	-52	-48	33	37	42	48	54	48	42	37	37	4	13
3839	OTHER ELECTRICAL APPARATUS & SUPPLIES	63	38	58	55	53	71	7	48	49	49	43	38	33	-59	-48	37	42	48	54	62	60	57	55	55	18	48
38400/1	MOTOR VEHICLES	49	28	46	43	48	73	8	66	79	93	96	100	96	-45	96	91	79	67	57	49	66	86	93	93	3	3
38402/3/9	MOTOR VEHICLE PARTS & ACCESSORIES	15	9	18	20	15	21	5	8	7	7	7	8	8	-11	-43	10	11	12	14	17	23	31	41	41	31	331
3852	RAILWAY EQUIPMENT	32	19	32	32	29	44	22	28	33	38	33	28	24	-28	-24	35	48	65	86	92	71	52	37	37	3	7
851/4/5/9	OTHER TRANSPORT	73	44	65	60	56	73	24	48	51	53	54	54	55	-69	-25	53	52	51	50	50	61	72	85	85	31	59
3901	JEWELLERY & RELATED ARTICLES	49	51	19	11	9	48	11	8	11	16	14	13	12	-45	-77	7	4	2	1	1	2	5	14	14	7	102
/3902/3/9	OTHER MANUFACTURING INDUSTRIES	89	75	100	93	82	91	15	60	61	61	62	63	63	-85	-29	55	48	41	36	31	34	36	39	39	-16	-29
	AVERAGE-MANUFAC.	56	50	53	50	51	67	28	50	51	52	49	48	48	-52	21	49	51	51	51	51	55	57	56	56	7	52
	SERVICES																										
4100	ELECTRICITY	0	0	0	0	0		11	98	96	89	38	11	3	4		3	2	3	3	3	0	0	0	0	-3	-100
4200	WATER SUPPLY														4											0	
5100	BUILDING CONSTRUCTION	0	0	0	0	0	0	0	0	0	0	0	0	0	4		0	0	0	0	0	0	0	0	0	0	
5200/300	CIVIL ENGINEERING & OTHER CONSTRUCTION	66	55	85	39	51	85	7	85	86	90	87	93	90	-62	36	100	94	99	91	84	75	63	55	57	-43	-43
620/21/22	WHOLESALE & RETAIL TRADE & MOTOR TRADE	1	1	0	2	2	64	19	2	3	4	4	4	4	3	172	4	3	3	3	2	3	3	3	3	-1	-20
6300	CATERING & ACCOMODATION SERVICES	94	75	68	44	48	71	9	60	58	55	59	64	68	-90	-27	69	71	72	73	81	67	59	52	52	-17	-25
7100	TRANSPORT & STORAGE	94	95	37	96	96	92	23	77	77	76	80	84	88	-90	-6	92	97	98	94	97	98	93	84	84	-8	-9
7200	COMMUNICATION	53	59	59	74	63	71	8	40	33	27	34	43	53	-49	0	55	57	60	62	71	57	50	43	43	-12	-22
81/8200	FINANCIAL INSTITUTIONS & INSURANCE SERVI	91	96	34	95	87	84	19	68	78	89	90	92	93	-87	2	97	100	97	94	83	100	90	80	80	-16	-17
8310	REAL ESTATE	0	0	0	11	13	26	8	19	20	21	24	26	29	4		32	35	39	42	52	38	31	25	25	-7	-22
8320	BUSINESS SERVICES	28	25	76	20	22	38	7	31	35	39	38	36	34	-24	20	40	46	53	61	76	54	41	30	30	-10	-24
8330	MACHINERY & EQUIPMENT														4											0	
9330	MEDICAL, DENTAL & OTHER							20	22	24	25	29	34	39	4		41	44	47	50	59	49	45	41	41	0	0
9700	OTHER SERVICES, PROFIT SEEKING	28	46	55	98	71	63	11	27	26	24	29	34	39	-24	43	40	40	41	41	47	40	38	37	37	-3	-9
9800	OTHER SERVICES, NON-PROFIT SEEKING							0	0	0	0	0	0	0	4		0	0	0	0	0	0	0	0	0	0	
9900	OTHER	29	27	79	22									0	-25	-100					0					0	
	AVERAGE	40	40	41	42	41	60	11	41	41	42	39	40	39	-36	-4	44	45	47	47	47	45	39	35	35	-9	-21

SOURCE: OWN COMPUTATIONS FROM IDC (1996).

NOTE: THESE COMPUTATIONS WERE OBTAINED USING THE AQUINO (1978) Qi INDEX.

TABLE:A-5

INDICES OF INTRA-INDUSTRY BETWEEN SA AND ROW (PERCENTAGES) F0R 1972-93 AT CURRENT RANDS:THREE-DIGIT LEVEL

ISIC	SECTOR	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93
311-312	FOOD	33	35	40	41	40	36	39	40	47	50	54	57	52	52	51	50	49	50	53	56	58	58
313	BEVERAGES	78	87	78	68	73	84	82	84	76	69	67	68	61	76	80	80	78	82	83	78	73	73
314	TOBACCO PRODUCTS	20	32	47	73	75	82	74	91	97	97	98	96	97	69	50	39	31	21	33	57	86	86
321	TEXTILES	72	67	60	63	66	73	69	71	64	61	59	60	55	73	82	86	89	90	93	86	76	76
322	CLOTHING	87	82	80	70	55	39	35	35	42	49	45	39	39	28	25	25	26	23	35	56	82	82
323	LEATHER PRODUCTS	72	77	83	81	90	94	95	74	55	39	30	22	18	24	35	49	74	95	92	91	79	79
324	FOOTWEAR	50	48	43	44	53	68	69	71	63	55	50	49	41	62	75	84	91	94	79	49	28	28
331	WOOD & WOOD PRODUCTS	27	30	32	39	63	99	79	77	86	95	98	96	84	99	95	96	99	96	95	99	95	95
332	FURNITURE	45	44	46	41	23	11	7	0	0	0	0	0	16	14	15	17	21	22	29	43	59	59
341	PAPER AND PAPER PRODUCTS	60	48	35	30	39	53	58	61	56	51	60	74	80	82	66	55	45	33	30	29	29	29
342	PRINTING & PUBLISHING	40	42	43	50	35	27	15	17	16	14	14	14	12	15	15	14	12	12	14	14	15	15
351-352	CHEMICAL PRODUCTS EXCEPT	48	45	39	40	49	58	58	61	55	46	48	53	49	62	66	67	65	70	65	56	50	50
353/4	PETROLEUM REFINERIES & PR	91	91	89	90	91	93	93	94	93	91	90	88	85	87	87	85	83	82	83	81	79	79
355	RUBBER PRODUCTS	51	44	34	31	36	44	42	43	36	31	28	27	22	31	36	38	38	44	45	41	39	39
356	PLASTIC PRODUCTS	39	31	23	19	25	36	38	34	24	18	17	18	17	26	32	35	38	46	50	49	50	49
361	POTTERY	39	39	36	39	35	35	26	9	2	0	1	2	4	7	10	13	17	24	29	32	35	35
362	GLASS & GLASS PRODUCTS	41	37	31	30	44	65	76	75	63	53	48	46	38	60	74	84	92	92	99	86	74	74
369	OTHER NON-METALLIC MINER	71	74	81	81	64	51	50	55	61	62	57	53	43	47	45	41	38	36	40	45	50	50
371	IRON & STEEL BASIC INDUSTRI	99	96	89	91	71	38	23	24	31	38	36	31	31	25	24	26	30	29	25	24	22	22
372	NON-FERROUS METAL BASIC I	83	83	88	83	64	44	38	33	35	37	32	25	23	19	20	23	28	28	26	27	27	27
381	METAL PRODUCTS	75	70	61	60	60	66	58	64	60	57	49	44	34	51	59	62	62	66	70	70	71	71
382	MACHINERY	29	23	17	15	16	18	16	17	15	13	13	14	12	18	21	22	22	25	28	27	27	27
383	ELECTRICAL MACHINERY	25	20	15	13	15	18	17	18	15	13	12	12	11	16	20	22	22	27	29	28	28	28
384	MOTOR VEHICLES AND PARTS	12	12	11	12	12	13	11	13	12	11	12	13	13	22	28	31	29	30	42	49	57	57
385	OTHER TRANSPORT EQUIPME	40	34	27	25	27	31	28	30	27	25	25	27	25	35	39	39	37	40	50	55	63	63
	AVERAGE	53	52	49	49	49	51	48	48	45	43	42	41	38	44	46	47	49	50	53	53	54	54

SOURCE: OWN COMPUTATIONS FROM IDC (1996)

NOTE: THESE RESULTS WERE OBTAINED FROM USING THE GREENAWAY AND MILNER (1983) C*j* INDEX.

TABLE: A-6

COMPARATIVE INDICES(Bi, Qi AND Cj) FOR SELECTED YEARS BETWEEN SA AND ROW AT CURRENT RANDS:THREE-DIGIT LEVEL.

		1972			1984			1985			1993		
ISIC	SECTOR	Bi	Qi	Cj	Bi	Qi	Cj	Bi	Qi	Cj	Bi	Qi	Cj
311-31	FOOD	41	46	33	88	95	52	73	94	52	89	32	58
313	BEVERAGES	86	93	78	76	69	61	95	74	76	99	9	73
314	TOBACCO PRODUCTS	20	93	20	97	69	97	69	74	69	86	9	86
321	TEXTILES	74	18	72	60	90	55	80	90	73	76	4	76
322	CLOTHING	87	67	87	39	54	39	28	60	28	82	19	82
323	LEATHER PRODUCTS	96	94	72	39	44	18	31	41	24	93	17	79
324	FOOTWEAR	50	96	50	41	43	41	62	44	62	28	12	28
331	WOOD AND WOOD PRODUCTS	27	45	27	84	36	84	99	45	99	95	19	95
332	FURNITURE	45	24	45	16	77	16	14	80	14	59	3	59
341	PAPER AND PAPER PRODUCTS	64	50	60	81	19	80	95	20	82	66	3	29
342	PRINTING AND PUBLISHING	40	58	40	12	74	12	15	84	15	15	4	15
351-35	CHEMICAL PRODUCTS	49	35	48	51	10	49	66	10	62	55	36	50
355	RUBBER PRODUCTS	96	56	91	72	64	85	62	66	87	62	9	79
356	PLASTIC PRODUCTS	51	46	51	22	19	22	31	22	31	39	10	39
361	POTTERY, CHINA AND EARTHENWARE	39	34	39	17	14	17	26	18	26	49	6	49
362	GLASS AND GLASS PRODUCTS	39	34	39	4	3	4	7	5	7	35	10	35
369	OTHER NON-METALLIC MINERAL PRODUCTS	41	36	41	38	34	38	60	43	60	74	7	74
371	IRON AND STEEL BASIC INDUSTRIES	81	88	71	43	38	43	67	49	47	95	13	50
372	NON-FERROUS METAL BASIC INDUSTRIES	99	92	99	31	35	31	25	35	25	22	4	22
381	METAL PRODUCTS	83	90	83	23	26	23	19	28	19	27	4	27
382	MACHINERY	75	68	75	34	31	34	51	36	51	75	10	71
383	ELECTRICAL MACHINERY	29	25	29	12	11	12	18	12	18	27	13	27
384	MOTOR VEHICLES AND PARTS	25	22	25	11	9	11	16	11	16	28	10	28
385	OTHER TRANSPORT EQUIPMENT	13	11	12	13	11	13	22	15	22	57	3	57
390	OTHER MANUFACTURING INDUSTRIES	40	35	40	25	22	25	35	24	35	69	9	63
	AVERAGE	55	54	53	41	40	38	47	43	44	59	11	54

SOURCE: OWN COMPTATIONS FROM IDC (1996).

NOTE: THESE RESULTS WERE OBTAINED FROM USING THE GRUBEL-LLOYD (1975) Bi, AQUINO (1978) Qi AND GREENAWAY AND MILNER (1983) Cj INDICES.

TABLE:A-7

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND ROW (PERCENTAGES) FOR 1988-94 AT CURRENT RANDS-THREE DIGIT LEVEL.

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	Aver.(88-94)	ABS.CHANGE	% CHANGE
	RAW MATERIALS(PRIMARY COMMODITIES)										
1110	AGRICULTURE	40	25	36	46	84	64	37		-3	-6
2	MINING	12	10	10	10	9	8	11		-1	-5
	AVERAGE	26	17	23	28	46	36	24			
	MANUFACTURES										
311-312	FOOD	87	97	93	86	99	99	81	92	-5	-6
313	BEVERAGES	46	52	72	99	95	85	74	75	28	61
314	TOBACCO PRODUCTS	25	30	34	69	87	87	88	60	62	249
321	TEXTILES	75	72	71	71	72	69	60	70	-15	-20
322	CLOTHING	64	72	89	99	83	76	92	82	28	44
323	LEATHER PRODUCTS	60	65	76	84	92	97	98	82	38	63
324	FOOTWEAR	16	19	17	15	26	23	27	21	11	69
331	WOOD AND WOOD PRODUCTS	69	73	81	74	71	76	76	74	7	10
332	FURNITURE	43	41	41	36	36	33	46	39	3	6
341	PAPER AND PAPER PRODUCTS	67	60	71	73	71	74	77	70	10	14
342	PRINTING AND PUBLISHING	16	15	22	21	16	22	43	22	28	179
351-354	CHEMICAL PRODUCTS	52	55	54	60	70	64	71	61	19	38
355	RUBBER PRODUCTS	33	29	29	40	39	50	46	38	13	40
356	PLASTIC PRODUCTS	23	26	30	32	41	45	46	35	23	102
361	POTTERY, CHINA AND EARTHENWARE	18	26	28	34	35	27	30	28	12	69
362	GLASS AND GLASS PRODUCTS	80	87	81	73	76	80	65	78	-14	-18
369	OTHER NON-METALLIC MINERAL PRODUCTS	36	40	51	67	69	75	76	59	40	113
371	IRON AND STEEL BASIC INDUSTRIES	18	19	17	17	19	18	22	19	3	18
372	NON-FERROUS METAL BASIC INDUSTRIES	19	23	23	21	21	30	40	25	21	110
381	METAL PRODUCTS	56	71	81	85	71	78	88	76	32	57
382	MACHINERY	15	15	19	22	26	29	23	21	9	59
383	ELECTRICAL MACHINERY	10	13	19	18	20	26	18	18	7	74
384	MOTOR VEHICLES AND PARTS	13	15	27	28	44	39	38	29	25	189
385	OTHER TRANSPORT EQUIPMENT	13	13	20	14	15	16	17	15	3	23
390	OTHER MANUFACTURING INDUSTRIES	35	29	28	26	25	33	44	31	9	26
9999	UNCLASSIFIED	33	36	38	34	40	36	28	35	-5	-14
	TOTAL	89	86	84	85	88	88	92		3	3
	MANUFACTURING	70	78	82	82	85	85	76		6	9
	AVERAGE-MANUFACTURING	40	43	48	51	54	55	55		15	38
	AVERAGE-MANUFAC-RAW MATERIALS	38	40	45	48	52	52	52		14	36

SOURCE: OWN COMPUTATIONS FROM IDC (1996)

NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) B/ INDEX.

TABLE:A-8

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND ROW (PERCENTAGES) FOR 1988 95 AT CURRENT RANDS:FOUR-DIGIT LEVEL.

ISIC	DESCRIPTION	1988	1989	1990	1991	1992	1993	1994	1995
PRIMARY COMMODITIES (RAW MATERIALS)									
1	Agriculture	47	32	46	57	95	75	66	62
2	Mining	15	12	14	13	11	10	10	99
	AVERAGE	**31**	**22**	**30**	**35**	**53**	**42**	**38**	**81**
MANUFACTUTRES									
3111	Slaughtering	41	73	91	99	77	92	70	51
3112	Dairy products	34	54	89	83	70	93	94	98
3113	Fruit & vegetable canning	15	11	14	12	16	16	14	25
3114	Fish canning	66	36	38	54	59	76	81	65
3115	Veg & animal oils	73	61	61	91	56	45	48	29
3116	Grain mill products	26	55	49	45	42	47	54	55
3117	Bakery products	52	83	97	74	85	88	64	90
3118	Sugar refining	14	2	7	10	11	45	8	32
3119	Confectionary	60	64	78	96	96	94	52	83
3121	Food products nec	39	44	54	55	53	57	74	79
3122	Prepared animal feed	61	96	97	56	62	55	95	38
3131	Distilling industries	20	26	26	26	32	61	96	86
3132	Wine industries	57	51	37	25	27	17	15	10
3133	Malt & malt liquors	23	23	52	94	92	86	85	95
3134	Soft drinks & water	28	30	13	4	5	7	4	14
3140	Tobacco mfg	21	24	26	56	99	99	93	62
3211	Spinning & weaving	79	71	63	61	68	61	69	69
3212	Textile goods	24	35	29	21	38	42	43	52
3213	Knitting mills	36	39	58	74	68	79	67	69
3214	Carpets & rugs	41	47	76	75	77	70	86	99
3215	Cord & rope industries	92	76	66	67	64	77	61	62
3219	Textiles nec	16	18	17	15	19	21	21	21
3220	Wearing apparel	55	60	73	84	95	88	99	90
3231	Tanneries	60	58	70	84	95	91	63	82
3232	Fur dressing & dyeing	86	58	47	17	15	13	6	12
3233	Leather products	17	22	16	18	33	42	68	58
3240	Footwear	13	14	12	11	21	19	36	22
3311	Sawmills	65	66	72	64	63	64	90	66
3312	Wooden containers	8	15	19	18	28	66	97	76
3319	Wood & cork prods nec	32	34	39	52	59	75	74	29
3320	Wooden furn & fixtrs	52	51	52	46	43	40	35	42
3411	Pulp, paper, paperboard	41	33	44	45	40	47	32	31
3412	Paper containers	36	35	51	34	32	38	9	20
3419	Paper products nec	11	9	10	13	13	10	21	19
3420	Printing and publishing	13	12	16	16	13	18	42	42
3511	Industrial chemicals	57	58	53	62	82	73	98	96
3513	Synthetic products	20	25	29	34	46	32	49	49
3512	Fertilizers	92	78	91	92	96	99	79	64
3521	Paints & varnishes	48	50	59	60	48	42	67	75
3522	Drugs & medicines	13	14	11	10	13	13	17	15
3523	Cosmetics	41	45	51	65	75	69	75	92
3529	Chemicals nec	21	22	24	23	26	26	38	41
3530	Petroleum refineries	92	70	70	78	87	82	90	39
3540	Petroleum & coal prods	69	92	61	73	98	69	58	75
3551	Tyre & tube industries	48	31	30	45	48	59	73	76
3559	Rubber products nec	15	16	15	18	17	22	25	28
3560	Plastic products nec	19	20	22	25	34	37	55	50
3610	Pottery & china	14	20	21	26	28	22	31	33
3620	Glass & glass prods	69	74	66	60	66	69	69	54
3691	Structural clay prods	29	26	23	24	26	24	27	26
3692	Cement, lime, plaster	18	40	47	60	66	80	87	81
3699	Nonmetallics nec	32	38	61	85	90	95	90	93
3710	Iron & steel B-Met ind	22	25	22	22	23	22	18	21

SOURCE: OWN COMPUTATIONS FROM IDC(1996).

NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) B_i INDEX.

TABLE:A-8

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND ROW (PERCENTAGES) FOR 1988 95 AT CURRENT RANDS:FOUR-DIGIT LEVEL.

ISIC	DESCRIPTION	1988	1989	1990	1991	1992	1993	1994	1995
3720	Nonferrous metal ind	23	29	30	28	26	36	34	37
3811	Cutlery & hand tools	25	43	30	28	38	37	46	48
3812	Metal furn & fixtrs	19	23	29	33	41	49	47	39
3813	Structural metal prods	37	60	71	94	88	54	61	26
3819	Metal products nec	62	67	80	88	65	71	73	78
3821	Engines & turbines	7	14	17	17	16	26	23	29
3822	Agr machinery	21	31	41	28	32	23	41	27
3823	Metal & woodwkg mach	14	13	12	18	15	14	24	23
3824	Industrisial machinery	12	11	14	18	25	27	35	35
3825	Office machinery	5	6	9	9	10	10	13	12
3829	Machinery nec	17	13	15	20	25	31	35	47
3831	Elec industrial mach	9	10	16	13	16	19	26	29
3832	Radio, TV & comm eqpmt	5	7	8	12	14	20	21	16
3833	Electrical appliances	4	9	9	11	16	18	22	20
3839	Elec machinery nec	22	29	37	29	33	38	62	33
3841	Ship building	13	34	94	56	84	82	46	71
3842	Railroad equipment	51	53	65	51	52	45	52	54
3843	Motor vehicles	9	11	17	24	37	31	40	27
3844	Motorcycles	10	26	26	15	27	22	28	31
3845	Mfg of aircraft	18	10	19	9	16	18	40	39
3849	Transport eqpmt nec	9	5	5	4	5	5	17	10
3851	Scientific equipment	14	11	18	13	14	15	22	23
3852	Photo & optical eqpmt	6	6	8	6	10	9	18	16
3853	Watches & clocks	1	2	2	2	3	3	8	11
3901	Jewelry	22	22	20	15	13	30	8	24
3902	Musical instruments	19	19	23	16	10	23	47	54
3903	Sporting goods	15	19	20	22	29	28	31	21
3909	Mfg Industries nec	38	55	66	64	80	87	99	100
9999	Unclassified	40	45	49	57	48	43	34	4
	AVERAGE	33	36	40	41	44	46	50	47

SOURCE: OWN COMPUTATIONS FROM IDC(1996).

NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) B*i* INDEX.

TABLE:A-9

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND ROW (PERCENTAGES) AT CURRENT RANDS FOR 1988-1995:THREE DIGIT LEVEL

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994		ABS CHA	%CHANG
	RAW MATERIALS(PRIMARY COOMODITIES)										
1110	AGRICULTURE	40	25	36	46	84	64	37		-3	-65
2	MINING	12	10	10	8	9	8	11		-1	16
	AVERAGE	**26**	**17**	**23**	**27**	**46**	**36**	**24**		**-2**	**-24**
	MANUFACTURING										
311-312	FOOD	48	53	56	50	55	60	46	53	-2	-71
313	BEVERAGES	28	32	41	38	48	59	62	44	34	-49
314	TOBACCO PRODUCTS	25	30	34	58	87	87	88	58	62	-44
321	TEXTILES	75	72	71	64	72	69	59	69	-16	-81
322	CLOTHING	37	31	71	97	79	65	78	65	41	-62
323	LEATHER PRODUCTS	83	89	88	84	86	87	92	87	9	-83
324	FOOTWEAR	16	19	17	30	26	23	27	23	11	-13
331	WOOD AND WOOD PRODUCTS	69	73	81	71	71	76	75	74	6	-80
332	FURNITURE	43	41	41	7	36	33	46	35	3	-68
341	PAPER AND PAPER PRODUCTS	30	23	29	29	29	33	36	30	7	-53
342	PRINTING AND PUBLISHING	16	15	22	10	16	22	43	21	28	-10
351-354	CHEMICAL PRODUCTS	51	55	53	51	69	62	67	58	16	-73
355	RUBBER PRODUCTS	33	29	29	30	39	50	46	36	13	-57
356	PLASTIC PRODUCTS	11	26	30	23	41	45	46	32	35	23
361	POTTERY, CHINA AND EARTHENWARE	18	26	28	15	35	27	30	25	12	-21
362	GLASS AND GLASS PRODUCTS	80	87	81	70	76	80	65	77	-14	-82
369	OTHER NON-METALLIC MINERAL PRODUC	36	40	51	64	67	68	68	56	32	-61
371	IRON AND STEEL BASIC INDUSTRIES	18	19	17	14	19	18	22	18	3	-23
372	NON-FERROUS METAL BASIC INDUSTRIES	19	23	23	10	21	30	40	24	21	-26
381	METAL PRODUCTS	56	71	81	79	66	67	60	68	3	-75
382	MACHINERY	15	15	19	19	26	29	23	21	9	-4
383	ELECTRICAL MACHINERY	10	12	13	13	32	43	64	27	54	38
384	MOTOR VEHICLES AND PARTS	45	55	51	51	63	71	76	59	31	-69
385	OTHER TRANSPORT EQUIPMENT	20	13	20	2	15	16	17	15	-4	-31
390	OTHER MANUFACTURING INDUSTRIES	21	21	21	20	20	31	41	25	20	-32
9999	UNCLASSIFIED	33	36	38	33	40	36	28	35	-5	-57
	AVERAGE(MANUFACTURING)	**36**	**39**	**42**	**40**	**47**	**49**	**52**		**16**	**-45**
	AVERAGE(MANUFACT+RM)	**35**	**37**	**41**	**39**	**47**	**48**	**50**		**14**	**-43**

SOURCE: OWN COMPUATITIONS FROM IDC (1996).

NOTE: THESE RESULTS WERE OBTAINED USING THE GREENAWAY AND MILNER (1983) C*j* INDEX

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND COUNTRIES IN THE SOUTHERN AFRICAN REGION (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-10

SACU VS ANGOLA

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE	0	0	0	0	1	0	0	4
02100	COAL MINING			0	0	0	2	0	0
311-312	FOOD	0	0	0	0	0	0	0	0
313	BEVERAGES	0	0	0	0	0	0	0	0
314	TOBACCO PRODUCTS	0	0	0	0	0	0	0	0
321	TEXTILES	0	85	0	0	0	0	0	0
322	CLOTHING	0	0	0	0	0	0	1	0
323	LEATHER PRODUCTS		0	0	0	1	0	0	0
324	FOOTWEAR	0	0	0	0	0	0	0	0
331	WOOD AND WOOD PRODUCTS	0	0	0	0	0	0	0	0
332	FURNITURE	0	0	0	0	0	0	0	0
341	PAPER AND PAPER PRODUCTS	0	3	0	0	0	0	0	0
342	PRINTING AND PUBLISHING	0	19	24	0	0	0	0	0
351-354	CHEMICAL PRODUCTS	0	23	0	0	0	0	3	0
355	RUBBER PRODUCTS	0	0	0	0	0	0	0	0
356	PLASTIC PRODUCTS	0	1	0	0	0	0	0	0
361	POTTERY, CHINA AND EARTHENWARE	0	0	0	0	0	0	0	0
362	GLASS AND GLASS PRODUCTS	0	0	0	0	0	0	0	0
369	OTHER NON-METALLIC MINERAL PRO	0	0	0	0	0	0	0	0
371	IRON AND STEEL BASIC INDUSTRIE	0	0	0	0	0	0	0	0
372	NON-FERROUS METAL BASIC INDUST	0	0	0	0	0	0	96	92
381	METAL PRODUCTS	0	2	0	0	0	0	2	0
382	MACHINERY	0	3	0	0	0	0	2	0
383	ELECTRICAL MACHINERY	0	60	0	1	0	6	1	0
384	MOTOR VEHICLES AND PARTS	0	10	0	0	1	4	12	1
385	OTHER TRANSPORT EQUIPMENT	0	85	71	0	1	0	0	0
390	OTHER MANUFACTURING INDUSTRIES	0	1	0	0	39	9	15	86
99999	UNCLASSIFIED	0	70	0	2	79	47	1	2
	TOTAL	0	70	0	0	0	4	11	2
AVERAGE IIT IN MANUFACTURES		0	14	4	0	5	3	5	7

SOURCE: OWN COMPUTATIONS FROM IDC (1996).

NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) Bi INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND COUNTRIES IN THE SOUTHERN AFRICAN REGION (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-11

SACU VS MALAWI

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE	15	50	30	14	4	9	37	56
02100	COAL MINING	0	0	0	0	0	1	0	0
311-312	FOOD	83	71	93	55	60	62	79	63
313	BEVERAGES	0	0	0	1	1	2	2	1
314	TOBACCO PRODUCTS	0	41	0	0	1	0	6	0
321	TEXTILES	4	23	27	53	53	97	49	37
322	CLOTHING	1	3	24	72	75	54	38	26
323	LEATHER PRODUCTS	1	21	56	0	24	0	0	0
324	FOOTWEAR	1	3	7	2	0	2	0	0
331	WOOD AND WOOD PRODUCTS	30	90	33	78	59	32	27	52
332	FURNITURE	29	3	2	4	10	12	1	20
341	PAPER AND PAPER PRODUCTS	0	0	3	0	0	0	1	0
342	PRINTING AND PUBLISHING	1	2	0	0	0	1	0	0
351-354	CHEMICAL PRODUCTS	3	4	3	2	2	2	3	1
355	RUBBER PRODUCTS	0	0	0	0	0	0	0	0
356	PLASTIC PRODUCTS	0	1	4	1	11	1	2	1
361	POTTERY, CHINA AND EARTHENWARE	0	1	0	2	0	1	0	2
362	GLASS AND GLASS PRODUCTS	0	0	0	0	0	0	0	0
369	OTHER NON-METALLIC MINERAL PRODUCTS	0	0	0	0	0	0	1	1
371	IRON AND STEEL BASIC INDUSTRIES	0	0	0	0	0	0	1	9
372	NON-FERROUS METAL BASIC INDUSTRIES	7	1	10	6	16	38	16	26
381	METAL PRODUCTS	0	2	2	1	1	4	7	3
382	MACHINERY	1	1	2	0	1	1	2	1
383	ELECTRICAL MACHINERY	4	2	1	3	22	81	76	23
384	MOTOR VEHICLES AND PARTS	5	2	0	1	3	2	2	5
385	OTHER TRANSPORT EQUIPMENT	11	5	5	4	3	1	2	3
390	OTHER MANUFACTURING INDUSTRIES	78	81	45	1	1	21	12	1
99999	UNCLASSIFIED	72	79	66	49	55	4	7	46
	TOTAL	45	26	36	29	32	39	48	47
AVERAGE IIT IN MANUFACTURES		13	17	15	13	15	16	13	12

SOURCE: OWN COMPUTATIONS FROM IDC (1996).

NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) Bi INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND COUNTRIES IN THE SOUTHERN AFRICAN REGION (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-12

SACU VS MAURITIUS

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE	4	2	6	1	2	6	1	1
02100	COAL MINING	0	0	0	0	0	0	0	0
311-312	FOOD	10	9	9	3	5	32	10	3
313	BEVERAGES	10	5	3	8	2	3	0	3
314	TOBACCO PRODUCTS								0
321	TEXTILES	7	34	19	30	33	29	23	47
322	CLOTHING	92	100	71	87	37	7	100	96
323	LEATHER PRODUCTS	49	64	53	61	68	1	1	1
324	FOOTWEAR	0	0	0	29	0	2	71	81
331	WOOD AND WOOD PRODUCTS	6	6	35	4	0	6	7	4
332	FURNITURE	0	1	1	1	1	0	1	0
341	PAPER AND PAPER PRODUCTS	0	1	2	2	1	0	0	2
342	PRINTING AND PUBLISHING	57	19	55	26	17	9	60	5
351-354	CHEMICAL PRODUCTS	5	0	1	2	3	0	1	1
355	RUBBER PRODUCTS	0	3	32	2	1	1	0	1
356	PLASTIC PRODUCTS	1	3	4	1	1	1	1	1
362	GLASS AND GLASS PRODUCTS	0	0	0	0	1	0	0	0
369	OTHER NON-METALLIC MINERAL PRODUCTS	0	0	4	2	3	2	0	0
371	IRON AND STEEL BASIC INDUSTRIES	0	0	0	0	0	0	0	0
372	NON-FERROUS METAL BASIC INDUSTRIES	12	19	13	20	5	3	27	58
381	METAL PRODUCTS	1	3	6	2	4	1	1	0
382	MACHINERY	12	7	4	9	8	5	14	5
383	ELECTRICAL MACHINERY	7	41	25	18	10	25	4	5
384	MOTOR VEHICLES AND PARTS	50	49	99	23	14	3	16	20
385	OTHER TRANSPORT EQUIPMENT	46	44	13	27	17	36	42	24
390	OTHER MANUFACTURING INDUSTRIES	93	11	14	42	20	15	40	38
99999	UNCLASSIFIED?	22	32	33	17	43	1	1	17
	TOTAL	8	8	9	7	7	7	5	11
AVERAGE IIT IN MANUFACTURES		20	19	21	17	12	8	18	16

SOURCE: OWN COMPUTATIONS FROM IDC (1996).

NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) Bi INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND COUNTRIES IN THE SOUTHERN AFRICAN REGION (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-13

SACU VS MOZAMBIQUE

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE	56	45	79	89	74	80	87	95
02100	COAL MINING	0	0	0	0	0	0	0	0
311-312	FOOD	10	12	11	5	8	11	12	10
313	BEVERAGES	0	0	0	0	0	0	0	0
314	TOBACCO PRODUCTS	0	0	13	0	0	0	0	0
321	TEXTILES	0	0	2	4	12	3	11	2
322	CLOTHING	0	3	0	1	7	32	91	26
323	LEATHER PRODUCTS	0	3	0	8	0	0	0	0
324	FOOTWEAR	0	0	0	0	0	0	0	0
331	WOOD AND WOOD PRODUCTS	46	54	60	24	31	8	16	15
332	FURNITURE	0	0	0	0	0	0	0	0
341	PAPER AND PAPER PRODUCTS	0	0	0	0	0	0	0	0
342	PRINTING AND PUBLISHING	71	4	0	5	0	0	0	0
351-354	CHEMICAL PRODUCTS	40	5	2	0	1	3	3	0
355	RUBBER PRODUCTS	5	3	100	96	81	59	78	65
356	PLASTIC PRODUCTS	0	0	0	0	0	0	0	0
361	POTTERY, CHINA AND EARTHENWARE	0	0	0	0	0	0	0	0
362	GLASS AND GLASS PRODUCTS	0	0	4	0	0	0	1	0
369	OTHER NON-METALLIC MINERAL PRODUCTS	0	0	0	0	0	0	0	0
371	IRON AND STEEL BASIC INDUSTRIES	4	2	10	0	0	0	4	16
372	NON-FERROUS METAL BASIC INDUSTRIES	0	11	7	10	1	0	1	47
381	METAL PRODUCTS	3	5	3	1	1	1	1	0
382	MACHINERY	4	1	1	0	2	0	6	4
383	ELECTRICAL MACHINERY	0	2	0	1	3	0	0	0
384	MOTOR VEHICLES AND PARTS	4	1	1	0	12	2	2	4
385	OTHER TRANSPORT EQUIPMENT	0	3	0	0	7	2	0	2
390	OTHER MANUFACTURING INDUSTRIES	6	1	4	14	0	4	8	5
99999	UNCLASSIFIED	9	13	10	30	25	0	0	2
	TOTAL	13	9	13	11	13	9	11	13
AVERAGE IIT IN MANUFACTURES		8	5	9	8	7	5	9	8

SOURCE: OWN COMPUTATIONS FROM IDC (1996).

NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) Bi INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND COUNTRIES IN THE SOUTHERN AFRICAN REGION (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-14

SACU vs TANZANIA

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE	2	63	4	1	0	4	43	48
02100	COAL MINING		0			3	0	0	1
311-312	FOOD	0	0	58	11	33	11	33	19
313	BEVERAGES		0	0	0	0	0	0	0
314	TOBACCO PRODUCTS							0	0
321	TEXTILES	0		0	0	35	2	1	4
322	CLOTHING	0	0	0	0	1	58	5	0
323	LEATHER PRODUCTS	18		0	0	0	0	5	0
324	FOOTWEAR	0	0			0	0	16	1
331	WOOD AND WOOD PRODUCTS	39	43	68	0	0	3	46	4
332	FURNITURE		33	0	0	1	1	0	1
341	PAPER AND PAPER PRODUCTS	0	0	0	17	0	0	0	0
342	PRINTING AND PUBLISHING	0	1	1	0	14	0	8	46
351-354	CHEMICAL PRODUCTS	0	0	0	0	1	0	0	0
355	RUBBER PRODUCTS			0	0		0	0	0
356	PLASTIC PRODUCTS	0	0	0		90	0	0	0
361	POTTERY, CHINA AND EARTHENWARE		0	0			0	0	0
362	GLASS AND GLASS PRODUCTS	0	0	0	0		0	0	0
369	OTHER NON-METALLIC MINERAL PRODUCTS		0	0	0	0	0	0	0
371	IRON AND STEEL BASIC INDUSTRIES			0	0	0	0	0	0
372	NON-FERROUS METAL BASIC INDUSTR					0	0	0	0
381	METAL PRODUCTS	7	0	0	0	3	1	0	0
382	MACHINERY	82	10	0	0	5	0	5	1
383	ELECTRICAL MACHINERY	18	0	0	18	21	2	10	1
384	MOTOR VEHICLES AND PARTS	0	65	9	67	39	3	88	2
385	OTHER TRANSPORT EQUIPMENT			0	0	15	27	15	8
390	OTHER MANUFACTU INDUS	0	1	0	59	28	2	77	3
99999	UNCLASSIFIED	90	57	47	85	87	0	1	1
	TOTAL	13	78	40	20	58	35	10	6
AVERAGE IIT IN MANUFACTURES		15	11	8	12	17	4	12	4

SOURCE: OWN COMPUTATIONS FROM IDC (1996).

NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) Bi INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND COUNTRIES IN THE SOUTHERN AFRICAN REGION (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-15

SACU VS ZAMBIA

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE	24	11	7	62	38	18	44	29
02100	COAL MINING	12	7	26	1	0	0	4	1
311-312	FOOD	7	2	1	1	3	10	11	8
313	BEVERAGES	8	0	0	0	0	1	1	0
314	TOBACCO PRODUCTS	0	0	0	0	0	0	0	26
321	TEXTILES	8	6	1	11	24	11	37	24
322	CLOTHING	17	22	11	25	4	10	62	1
323	LEATHER PRODUCTS	22	22	8	29	22	54	14	56
324	FOOTWEAR	0	0	0	0	0	5	5	0
331	WOOD AND WOOD PRODUCTS	77	69	51	81	81	39	56	98
332	FURNITURE	0	0	1	0	0	0	0	0
341	PAPER AND PAPER PRODUCTS	0	0	0	0	1	27	10	1
342	PRINTING AND PUBLISHING	73	49	37	0	1	0	0	0
351-354	CHEMICAL PRODUCTS	1	0	0	0	1	1	2	1
355	RUBBER PRODUCTS	3	0	0	0	0	0	0	1
356	PLASTIC PRODUCTS	0	0	0	0	0	1	0	0
361	POTTERY, CHINA AND EARTH	0	0	0	0	0	0	0	0
362	GLASS AND GLASS PRODUCTS	0	0	0	0	0	0	0	1
369	OTHER NON-METALLIC MIN PROD	7	2	5	2	26	28	35	24
371	IRON AND STEEL BASIC INDUSTRI	0	0	1	1	2	5	19	24
372	NON-FERROUS MET BASIC IND	73	70	32	72	98	61	36	30
381	METAL PRODUCTS	1	1	0	0	1	1	1	1
382	MACHINERY	1	1	0	1	1	1	4	2
383	ELECTRICAL MACHINERY	2	1	1	1	1	3	28	38
384	MOTOR VEHICLES AND PARTS	4	2	2	3	9	4	9	4
385	OTHER TRANSPORT EQUIPMENT	1	2	0	5	6	1	9	4
390	OTHER MANUFAC INDUS	38	25	29	22	21	31	20	10
99999	UNCLASSIFIED	90	96	87	86	45	4	7	14
	TOTAL	12	3	3	5	7	11	21	14
AVERAGE IIT IN MANUFACTURES		17	14	10	13	13	12	14	14

SOURCE: OWN COMPUTATIONS FROM IDC (1996).

NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) Bi INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND COUNTRIES IN THE SOUTHERN AFRICAN REGION (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-16

SACU ZIMBABWE

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE	19	9	13	11	51	35	29	73
02100	COAL MINING	78	60	46	49	93	91	41	42
311-312	FOOD	63	93	96	99	75	66	65	79
313	BEVERAGES	13	29	46	66	92	88	75	89
314	TOBACCO PRODUCTS	10	11	4	25	86	52	17	96
321	TEXTILES	89	85	67	50	88	95	92	78
322	CLOTHING	77	63	71	76	26	29	38	99
323	LEATHER PRODUCTS	12	27	14	14	14	20	5	19
324	FOOTWEAR	3	3	2	5	5	25	23	28
331	WOOD AND WOOD PRODUCTS	17	21	25	40	22	36	31	25
332	FURNITURE	32	15	15	63	26	23	27	41
341	PAPER AND PAPER PRODUCTS	24	8	18	9	21	11	19	25
342	PRINTING AND PUBLISHING	70	65	72	78	83	50	30	26
351-354	CHEMICAL PRODUCTS	6	13	4	5	10	11	11	7
355	RUBBER PRODUCTS	65	51	65	10	61	40	30	14
356	PLASTIC PRODUCTS	40	33	32	20	42	31	13	13
361	POTTERY, CHINA AND EARTH	99	78	93	31	92	86	42	14
362	GLASS AND GLASS PRODUCTS	4	4	16	2	11	21	40	28
369	OTHER NON-METALLIC MIN PROD	97	93	71	73	97	94	92	86
371	IRON AND STEEL BASIC INDUSTRIES	37	35	31	17	29	41	32	9
372	NON-FERROUS MET BASIC INDUS	7	16	20	27	33	32	42	20
381	METAL PRODUCTS	97	83	77	53	100	71	77	54
382	MACHINERY	10	11	10	7	10	6	16	8
383	ELECTRICAL MACHINERY	82	69	63	46	57	38	28	17
384	MOTOR VEHICLES AND PARTS	54	65	34	8	15	8	19	11
385	OTHER TRANSPORT EQUIPMENT	22	28	32	26	13	18	16	16
390	OTHER MANUFAC INDUSTRIES	58	48	76	61	64	68	69	14
99999	UNCLASSIFIED	70	68	87	54	59	20	20	44
	TOTAL	72	69	59	49	69	53	62	38
AVERAGE IIT IN MANUFACTURES		45	43	44	37	47	42	37	37

SOURCE: OWN COMPUTATIONS FROM IDC (1996).

NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) Bi INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND COUNTRIES IN THE SOUTHERN AFRICAN REGION (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-17

SACU VS THE REST OF SADC

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE	57	60	67	48	81	65	69	99
02100	COAL MINING	89	80	83	88	27	25	99	48
311-312	FOOD	93	52	44	24	37	45	50	43
313	BEVERAGES	37	16	7	6	4	7	7	11
314	TOBACCO PRODUCTS	60	32	32	4	6	4	5	2
321	TEXTILES	56	61	52	41	78	68	87	85
322	CLOTHING	95	89	85	57	68	73	55	77
323	LEATHER PRODUCTS	20	38	26	27	41	37	16	31
324	FOOTWEAR	58	53	58	57	54	58	53	61
331	WOOD AND WOOD PRODUCTS	66	67	53	87	58	86	88	93
332	FURNITURE	72	52	36	28	37	48	65	64
341	PAPER AND PAPER PRODUCTS	9	3	7	3	8	9	6	12
342	PRINTING AND PUBLISHING	68	72	33	29	27	16	7	10
351-354	CHEMICAL PRODUCTS	7	7	3	3	5	6	7	3
355	RUBBER PRODUCTS	17	13	33	19	81	18	29	19
356	PLASTIC PRODUCTS	14	11	11	7	16	12	8	6
361	POTTERY, CHINA AND EARTHEN	28	20	26	9	36	29	16	5
362	GLASS AND GLASS PRODUCTS	2	2	8	1	3	9	13	15
369	OTHER NON-METALLIC MINPROD	64	48	43	42	58	48	53	45
371	IRON AND STEEL BASIC INDUSTRIES	18	16	16	8	14	19	17	10
372	NON-FERROUS MET BASIC INDUS	7	17	20	28	35	32	68	55
381	METAL PRODUCTS	48	37	34	23	46	26	34	26
382	MACHINERY	7	5	5	4	5	3	10	6
383	ELECTRICAL MACHINERY	44	35	33	22	29	36	30	17
384	MOTOR VEHICLES AND PARTS	32	33	15	5	10	5	14	8
385	OTHER TRANSPORT EQUIPMENT	22	21	16	15	10	11	11	13
390	OTHER MANU INDUSTRIES	93	57	41	33	29	35	85	50
99999	UNCLASSIFIED	88	83	81	55	55	5	3	21
	TOTAL	47	40	35	29	36	28	36	26
AVERAGE IIT IN MANUFACTURES		43	36	31	25	33	29	32	30

SOURCE: OWN COMPUTATIONS FROM IDC (1996).

NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) Bi INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND REGIONS OF THE WORLD (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-18

SACU AND AUSTRALIA AND NEW ZEALAND

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE	12	4	13	14	2	38	35	38
02100	OTHER MINING	65	86	58	55	77	40	48	21
311-312	FOOD	6	5	21	9	5	7	12	16
313	BEVERAGES	37	45	18	17	39	51	15	28
314	TOBACCO PRODUCTS							0	
321	TEXTILES	40	33	48	52	51	64	63	57
322	CLOTHING	92	77	69	100	71	87	76	87
323	LEATHER PRODUCTS	57	46	68	7	14	11	14	21
324	FOOTWEAR	10		22	6	71	41	21	79
331	WOOD AND WOOD PRODUCTS	46	33	43	29	88	50	36	95
332	FURNITURE	50	75	0	11	6	18	19	18
341	PAPER AND PAPER PRODUCTS	19	46	26	49	4	5	11	7
342	PRINTING AND PUBLISHING	62	69	58	81	41	40	56	73
351-354	CHEMICAL PRODUCTS	63	46	64	67	92	69	79	69
355	RUBBER PRODUCTS	33	45	85	80	63	96	75	99
356	PLASTIC PRODUCTS	86	52	65	40	39	49	73	79
361	POTTERY, CHINA AND EARTHENWARE	38	22	30	27	90	92	51	84
362	GLASS AND GLASS PRODUCTS	62	43	63	93	82	59	66	82
369	OTHER NON-METALLIC MINERAL PRODUCT	55	20	31	33	31	14	24	41
371	IRON AND STEEL BASIC INDUSTRIES	17	2	6	4	8	8	5	14
372	NON-FERROUS METAL BASIC INDUSTRIES	54	25	15	13	24	30	24	40
381	METAL PRODUCTS	82	54	52	57	65	59	63	55
382	MACHINERY	42	64	57	82	56	86	64	54
383	ELECTRICAL MACHINERY	48	61	75	62	79	82	37	35
384	MOTOR VEHICLES AND PARTS	93	63	85	60	80	83	68	90
385	OTHER TRANSPORT EQUIPMENT	17	17	11	17	29	31	34	43
390	OTHER MANUFACTURING INDUSTRIES	79	93	99	72	90	91	80	95
	AVERAGE IIT- MAUFACTURING	49	45	46	45	51	51	43	57

SOURCE: OWN COMPUTATIONS FROM IDC (1996)

NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) Bi INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND REGIONS OF THE WORLD (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-19
SACU AND BRAZIL

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE	5	12	14	6	0	18	44	6
02100	OTHER MINING	20	24	22	4	7	10	2	3
311-312	FOOD	2	8	16	5	9	23	30	19
313	BEVERAGES	3	19	74	3	78	3	0	0
314	TOBACCO PRODUCTS								
321	TEXTILES	2	8		7	0	38	48	79
322	CLOTHING				55	1		59	1
323	LEATHER PRODUCTS	0	3	7	0		1	0	0
324	FOOTWEAR			0				9	0
331	WOOD AND WOOD PRODUCTS			5	13	35	5	2	12
332	FURNITURE							40	15
341	PAPER AND PAPER PRODUCTS	72	37	64	70	89	86	82	65
342	PRINTING AND PUBLISHING	4	5	9	71	7	32	23	28
351-354	CHEMICAL PRODUCTS	87	89	61	83	98	98	99	96
355	RUBBER PRODUCTS	0		1			47	9	21
356	PLASTIC PRODUCTS	0	14	9	6	31	96	85	38
361	POTTERY, CHINA AND EARTHENWARE				1	2		5	
362	GLASS AND GLASS PRODUCTS		0			52	25	18	0
369	OTHER NON-METALLIC MINERAL PRODUCTS		0	1		12	44	27	25
371	IRON AND STEEL BASIC INDUSTRIES	53	50	73	98	95	75	88	66
372	NON-FERROUS METAL BASIC INDUSTRIES	66	89	95	65	48	97	45	83
381	METAL PRODUCTS	1	2	7	15	29	37	46	70
382	MACHINERY	4	1	3	10	12	11	25	51
383	ELECTRICAL MACHINERY	19	6	7	11	5	21	26	7
384	MOTOR VEHICLES AND PARTS	3	0	1	3	27	44	6	15
385	OTHER TRANSPORT EQUIPMENT	1	8	4	5	51	22	35	34
390	OTHER MANUFACTURING INDUSTRIES	0	85	13	2	67	21	15	97
	AVERAGE IIT- MAUFACTURING	19	24	24	28	38	41	34	36

SOURCE: OWN COMPUTATIONS FROM IDC (1996)
NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) Bi INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND REGIONS OF THE WORLD (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-20

SACU AND THE THE CARIBBEAN

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE	51	53	92	42	53	61	71	18
311-312	FOOD	15	70	45	25	86	68	58	28
313	BEVERAGES			1	20	55	73	26	33
321	TEXTILES	24	28	39	14	22	76	87	59
323	LEATHER PRODUCTS			32	59	15			1
324	FOOTWEAR								26
331	WOOD AND WOOD PRODUCTS			88	18	79	13	14	0
332	FURNITURE			0					0
341	PAPER AND PAPER PRODUCTS	12	14	2	0	3	84	51	78
342	PRINTING AND PUBLISHING					3	8	0	8
351-354	CHEMICAL PRODUCTS	9	4	10	23	58	82	85	61
355	RUBBER PRODUCTS			2			9	11	66
356	PLASTIC PRODUCTS					17	2	82	94
361	POTTERY, CHINA AND EARTHENWARE			99		1		61	1
362	GLASS AND GLASS PRODUCTS			70			51		12
369	OTHER NON-METALLIC MINERAL PRODUCTS				11	88		33	16
371	IRON AND STEEL BASIC INDUSTRIES	0			22		0		0
372	NON-FERROUS METAL BASIC INDUSTRIES	4	25				32	2	23
381	METAL PRODUCTS	44	18	3	49	1	5	2	1
382	MACHINERY	22	0	12	18	45	15	17	87
383	ELECTRICAL MACHINERY	1	2	7	1	20	5	18	39
384	MOTOR VEHICLES AND PARTS	54	3	0	6	21	3	32	61
385	OTHER TRANSPORT EQUIPMENT	62	49	54	48	94	44	7	71
390	OTHER MANUFACTURING INDUSTRIES	19	24	3	17	69	25	59	86
	AVERAGE IIT- MAUFACTURING	22	22	27	22	40	33	36	37

SOURCE: OWN COMPUTATIONS FROM IDC (1996)

NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) Bi INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND REGIONS OF THE WORLD (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-21
SACU AND CENTRAL AMERICA

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
1100	AGRICULTURE			1	2		66	10	5
02100	OTHER MINING								
311-312	FOOD	3		1			0	8	16
314	TOBACCO PRODUCTS								
321	TEXTILES	3		68	44	12	33	89	63
322	CLOTHING		7	28		54	16	92	5
323	LEATHER PRODUCTS								0
331	WOOD AND WOOD PRODUCTS								
341	PAPER AND PAPER PRODUCTS		29	1	92	27			
351-354	CHEMICAL PRODUCTS	94	51	36	85	43	90	28	81
355	RUBBER PRODUCTS					5			
356	PLASTIC PRODUCTS	-	-	100	90	38	13		74
361	POTTERY, CHINA AND EARTHENWARE								
362	GLASS AND GLASS PRODUCTS	3	1			2	23		0
369	OTHER NON-METALLIC MINERAL PRODUCTS								1
371	IRON AND STEEL BASIC INDUSTRIES								
372	NON-FERROUS METAL BASIC INDUSTRIES				2				4
381	METAL PRODUCTS	4	3	0	0	0	5	2	3
382	MACHINERY	85	15	11	29	21	10	71	36
383	ELECTRICAL MACHINERY					5		19	3
384	MOTOR VEHICLES AND PARTS	23				32	54	39	1
385	OTHER TRANSPORT EQUIPMENT	54	19	55	74	3	13	8	33
390	OTHER MANUFACTURING INDUSTRIES	96	4	84	-	68	50	17	79
	AVERAGE IIT- MAUFACTURING	37	14	38	46	24	28	37	27

SOURCE: OWN COMPUTATIONS FROM IDC (1996)
NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) Bi INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND REGIONS OF THE WORLD (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-22
SACU AND CHINA AND MACAU

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE	21	2	63	51	69	58	37	91
02100	OTHER MINING	35	34	23	20	15	13	14	23
311-312	FOOD	3	4	28	4	0	1	5	3
313	BEVERAGES				39	1	12	4	30
314	TOBACCO PRODUCTS					0			4
322	CLOTHING						0		1
324	FOOTWEAR						0		0
332	FURNITURE	0							3
341	PAPER AND PAPER PRODUCTS		3	6	9	26	9	13	24
342	PRINTING AND PUBLISHING				0		7	9	0
351-354	CHEMICAL PRODUCTS	57	3	9	55	40	28	37	50
356	PLASTIC PRODUCTS			4		2	0	0	0
362	GLASS AND GLASS PRODUCTS	23					0	0	
371	IRON AND STEEL BASIC INDUSTRIES	97	15	4	12	26	12	73	95
372	NON-FERROUS METAL BASIC INDUSTRIES	3	5	8	13	10	42	68	33
381	METAL PRODUCTS	14	41	7	9	95	20	26	32
382	MACHINERY	40	1	2	3	4	5	9	7
383	ELECTRICAL MACHINERY		0		1	3	1	1	1
384	MOTOR VEHICLES AND PARTS			3	1	11	27	33	31
385	OTHER TRANSPORT EQUIPMENT		19				1	1	3
390	OTHER MANUFACTURING INDUSTRIES	0	3		0	1	12	0	4
	AVERAGE IIT- MAUFACTURING	26	10	8	12	17	10	19	18

SOURCE: OWN COMPUTATIONS FROM IDC (1996)
NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) Bi INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND REGIONS OF THE WORLD (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-23
SACU AND EAST ASIA

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE	61	29	55	68	99	98	55	77
02100	OTHER MINING	1	2	2	2	2	2	1	14
311-312	FOOD	55	58	61	58	48	48	44	36
313	BEVERAGES	0	1	1	22	3	6	1	3
314	TOBACCO PRODUCTS	96	48	97	15	0	1	39	0
321	TEXTILES	55	43	41	45	46	44	32	34
322	CLOTHING	2	14	55	91	98	78	8	9
323	LEATHER PRODUCTS	15	20	18	20	37	43	55	84
324	FOOTWEAR	0	0	0	0	3	1	1	2
331	WOOD AND WOOD PRODUCTS	23	20	26	24	26	40	39	36
332	FURNITURE	8	32	26	13	21	47	59	50
341	PAPER AND PAPER PRODUCTS	5	6	9	21	8	9	9	8
351-354	CHEMICAL PRODUCTS	95	100	91	95	88	96	89	93
356	PLASTIC PRODUCTS	4	3	5	4	11	8	13	14
362	GLASS AND GLASS PRODUCTS	83	67	66	25	33	25	16	7
369	OTHER NON-METALLIC MINERAL PRODUCT	21	39	54	88	73	52	61	62
372	NON-FERROUS METAL BASIC INDUSTRIES	4	11	6	8	12	9	10	8
382	MACHINERY	3	9	7	5	10	10	9	26
384	MOTOR VEHICLES AND PARTS	6	8	87	68	60	18	10	27
390	OTHER MANUFACTURING INDUSTRIES	89	99	96	92	99	93	81	66
	AVERAGE IIT- MAUFACTURING	31	32	41	38	38	35	32	31

SOURCE: OWN COMPUTATIONS FROM IDC (1996)
NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) Bi INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND REGIONS OF THE WORLD (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-24
SACU AND EASTERN EUROPE

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE	93	63	73	84	63	51	99	67
02100	OTHER MINING	3	0	28	18	10	2	0	0
311-312	FOOD	2	0	72	53	23	77	53	25
313	BEVERAGES	4	2	5	17	58	19	35	14
314	TOBACCO PRODUCTS			0	61	21	0	6	2
321	TEXTILES		13	57	16	65	89	48	55
322	CLOTHING	4		32	40	2	5	97	24
323	LEATHER PRODUCTS	16			35	88	64	32	16
324	FOOTWEAR				28	95	77	7	49
331	WOOD AND WOOD PRODUCTS	0	0	0	1	39	9	58	3
332	FURNITURE		81	21	77	91	72	38	17
341	PAPER AND PAPER PRODUCTS		85	47	86	41	32	23	28
342	PRINTING AND PUBLISHING		36	3	28	37	10	34	55
351-354	CHEMICAL PRODUCTS	3	7	4	5	40	32	20	39
355	RUBBER PRODUCTS	18				10	7	23	42
356	PLASTIC PRODUCTS	5	67	4	44	11	21	69	68
361	POTTERY, CHINA AND EARTHENWARE					0	1	0	0
369	OTHER NON-METALLIC MINERAL PRODUCTS			3		22	98	80	52
372	NON-FERROUS METAL BASIC INDUSTRIES	11	14	18	3	36	22	8	0
382	MACHINERY	0	3	3	77	38	28	6	19
383	ELECTRICAL MACHINERY	1	0	85	56	87	68	51	31
384	MOTOR VEHICLES AND PARTS	17	1	2	15	17	38	86	15
385	OTHER TRANSPORT EQUIPMENT	19		9	15	44	8	5	31
	AVERAGE IIT- MAUFACTURING	8	24	21	36	41	37	37	28

SOURCE: OWN COMPUTATIONS FROM IDC (1996)
NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) B_i INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND REGIONS OF THE WORLD (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-25
SACU AND JAPAN

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE	1	1	1	1	2	3	1	1
02100	OTHER MINING	1	0	0	0	0	1	0	1
311-312	FOOD	23	37	33	23	13	13	3	3
313	BEVERAGES	7	3	17	16	21	26	5	2
314	TOBACCO PRODUCTS			25		4			
321	TEXTILES	85	78	94	86	84	80	73	90
322	CLOTHING	3	3	10	1	2	7	3	4
323	LEATHER PRODUCTS	17	21	40	13	9	6	3	2
324	FOOTWEAR	8			1	18	42	100	58
331	WOOD AND WOOD PRODUCTS	6	10	6	11	8	13	15	39
332	FURNITURE	32	97	42	52	58	88	17	3
341	PAPER AND PAPER PRODUCTS	46	39	38	43	50	32	25	18
342	PRINTING AND PUBLISHING	0	1	3	1	0	2	9	1
351-354	CHEMICAL PRODUCTS	76	90	83	89	77	56	71	82
355	RUBBER PRODUCTS	0	0	0	0	0	0	0	0
356	PLASTIC PRODUCTS	1	0	2	1	4	1	1	2
361	POTTERY, CHINA AND EARTHENWARE		0		0	1	1	0	5
362	GLASS AND GLASS PRODUCTS	87	78	81	91	60	62	64	17
369	OTHER NON-METALLIC MINERAL PRODUCT	3	3	59	98	85	89	86	77
371	IRON AND STEEL BASIC INDUSTRIES	33	28	29	28	32	31	28	21
372	NON-FERROUS METAL BASIC INDUSTRIES	7	11	12	9	15	9	9	2
381	METAL PRODUCTS	5	4	15	26	21	32	51	66
382	MACHINERY	0	0	0	2	2	1	1	1
384	MOTOR VEHICLES AND PARTS	3	3	4	1	0	1	1	1
	AVERAGE IIT- MAUFACTURING	22	25	30	28	26	28	27	24

SOURCE: OWN COMPUTATIONS FROM IDC (1996)
NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) Bi INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND REGIONS OF THE WORLD (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-26

SACU AND MERCOSUR EXCLUDING BRAZIL

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
11100	AGRICULTURE	40	11	5	16	1	7	11	3
02100	OTHER MINING								
311-312	FOOD	1	2	4	17	15	36	11	9
313	BEVERAGES	37	23	39					17
314	TOBACCO PRODUCTS	3	-						
321	TEXTILES	95	71	39	2	80	28	18	7
322	CLOTHING	94	26	72	86	22	2	22	50
323	LEATHER PRODUCTS	-	-	4	1		11		3
324	FOOTWEAR	-	-	36	9			1	84
331	WOOD AND WOOD PRODUCTS		-	1	1	1	9	26	17
332	FURNITURE		3			30		6	
341	PAPER AND PAPER PRODUCTS	4	-	42	2			16	35
342	PRINTING AND PUBLISHING	89	-		64	78	2	4	9
351-354	CHEMICAL PRODUCTS	67	69	32	71	99	60	76	94
355	RUBBER PRODUCTS	84	90	14	44	23	14	21	16
356	PLASTIC PRODUCTS	17	49	21	1	1		6	10
361	POTTERY, CHINA AND EARTHENWARE		-				42	10	1
362	GLASS AND GLASS PRODUCTS	90	1	6	79	68	70	64	18
369	OTHER NON-METALLIC MINERAL PRODUCT	2	-		6	5	24	50	65
371	IRON AND STEEL BASIC INDUSTRIES		-				1	1	9
372	NON-FERROUS METAL BASIC INDUSTRIES		2						24
381	METAL PRODUCTS	56	57	98	50	41	57	91	90
382	MACHINERY	16	28	32	53	100	39	34	26
383	ELECTRICAL MACHINERY	9	3	3	61	78	82	50	24
384	MOTOR VEHICLES AND PARTS	1	1		2	9	36	97	100
385	OTHER TRANSPORT EQUIPMENT	81	2	28	13	31	20	29	22
390	OTHER MANUFACTURING INDUSTRIES	96	65	24	13	8	2	16	6
	AVERAGE IIT- MAUFACTURING	42	20	29	30	41	30	31	32

SOURCE: OWN COMPUTATIONS FROM IDC (1996)

NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) B*i* INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND REGIONS OF THE WORLD (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-27
SACU AND MIDDLE EAST

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE	25	17	10	31	14	20	4	23
02100	OTHER MINING	5	6	9	2	7	3	8	15
311-312	FOOD	45	20	22	26	47	59	75	48
313	BEVERAGES	95	98	57	17	7	9	34	36
314	TOBACCO PRODUCTS					0	0	32	
321	TEXTILES	29	31	27	20	33	55	47	67
322	CLOTHING	56	50	25	79	59	40	48	90
323	LEATHER PRODUCTS	25	54	69	98	54	55	40	31
324	FOOTWEAR	1		7		6	1	31	63
331	WOOD AND WOOD PRODUCTS	47	55	39	18	7	20	35	93
332	FURNITURE	21	31	97	3	15	4	12	28
341	PAPER AND PAPER PRODUCTS	5	7	5	8	5	5	13	42
342	PRINTING AND PUBLISHING	4	66	36	47	25	16	69	72
351-354	CHEMICAL PRODUCTS	99	80	87	78	86	72	73	77
355	RUBBER PRODUCTS	59	85	43	68	29	34	17	68
356	PLASTIC PRODUCTS	26	25	21	11	48	32	43	49
361	POTTERY, CHINA AND EARTHENWARE	24	66	15	4	33	24	7	10
362	GLASS AND GLASS PRODUCTS	84	59	57	59	52	80	65	47
369	OTHER NON-METALLIC MINERAL PRODUCT	39	99	48	64	80	84	38	44
371	IRON AND STEEL BASIC INDUSTRIES	0	0	0	0	0	0	3	2
372	NON-FERROUS METAL BASIC INDUSTRIES	4	5	8	4	4	7	27	14
381	METAL PRODUCTS	21	63	36	38	53	62	86	82
382	MACHINERY	59	19	32	41	48	64	44	52
383	ELECTRICAL MACHINERY	46	16	30	35	71	49	76	47
384	MOTOR VEHICLES AND PARTS	3	24	74	83	4	78	23	49
385	OTHER TRANSPORT EQUIPMENT	7	8	12	16	25	23	36	35
390	OTHER MANUFACTURING INDUSTRIES	85	97	63	40	34	54	58	17
	AVERAGE IIT- MAUFACTURING	37	46	38	37	33	37	41	48

SOURCE: OWN COMPUTATIONS FROM IDC (1996)
NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) Bi INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND REGIONS OF THE WORLD (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-28
SACU AND NORTH AFRICA

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE	34	87	68	1	17	3	1	86
02100	OTHER MINING						28		19
311-312	FOOD	53	59	9	1	63	55	88	72
313	BEVERAGES						7	6	21
314	TOBACCO PRODUCTS								0
321	TEXTILES	78	11	7	20	46	40	13	28
322	CLOTHING	3	33	1			84	8	6
323	LEATHER PRODUCTS			14			3	39	21
324	FOOTWEAR								33
331	WOOD AND WOOD PRODUCTS	7		6	0	0	11		65
332	FURNITURE						62	6	60
341	PAPER AND PAPER PRODUCTS	0		0	1	0		1	17
342	PRINTING AND PUBLISHING			40	74	48	7	53	25
351-354	CHEMICAL PRODUCTS	1	12	10	73	94	49	84	65
355	RUBBER PRODUCTS		39		0	13	-	25	29
356	PLASTIC PRODUCTS		100	6		7	84	22	10
361	POTTERY, CHINA AND EARTHENWARE							23	9
362	GLASS AND GLASS PRODUCTS						13	89	35
369	OTHER NON-METALLIC MINERAL PRODUCTS					0		4	41
371	IRON AND STEEL BASIC INDUSTRIES							0	0
372	NON-FERROUS METAL BASIC INDUSTRIES								
381	METAL PRODUCTS	1	56	4	6	22	10	68	51
382	MACHINERY		25	25	0	61	16	4	36
383	ELECTRICAL MACHINERY	8	2		32	96	62	54	66
384	MOTOR VEHICLES AND PARTS	12	3			77	45	17	8
385	OTHER TRANSPORT EQUIPMENT					50	91	23	73
390	OTHER MANUFACTURING INDUSTRIES			16		32	99	36	29
	AVERAGE IIT- MAUFACTURING	18	34	12	21	41	41	32	33

SOURCE: OWN COMPUTATIONS FROM IDC (1996)
NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) Bi INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND REGIONS OF THE WORLD (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-29
SACU AND NORTH AMERICA

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE	52	83	32	55	20	32	92	49
02100	OTHER MINING	76	57	89	89	99	73	93	91
311-312	FOOD	7	11	22	18	34	50	47	32
313	BEVERAGES	9	6	6	15	68	89	76	93
314	TOBACCO PRODUCTS				6	0	1	-	0
321	TEXTILES	57	60	45	52	89	88	82	86
322	CLOTHING	38	41	62	83	58	29	21	24
323	LEATHER PRODUCTS	81	67	96	96	43	19	19	27
324	FOOTWEAR	7	11	5	26	23	41	62	17
331	WOOD AND WOOD PRODUCTS	19	18	13	7	9	14	73	32
332	FURNITURE	59	79	70	28	84	11	19	31
341	PAPER AND PAPER PRODUCTS	95	89	85	77	77	54	72	71
342	PRINTING AND PUBLISHING	4	4	5	3	2	3	4	5
351-354	CHEMICAL PRODUCTS	38	26	35	46	86	74	79	74
355	RUBBER PRODUCTS	2	3	1	7	28	46	49	65
356	PLASTIC PRODUCTS	6	5	7	11	9	13	11	11
361	POTTERY, CHINA AND EARTHENWARE	17	8	12	4	5	37	31	51
362	GLASS AND GLASS PRODUCTS	35	26	28	46	49	46	66	87
369	OTHER NON-METALLIC MINERAL PRODUCT	30	27	52	63	54	60	48	36
371	IRON AND STEEL BASIC INDUSTRIES	5	12	12	19	20	5	10	9
372	NON-FERROUS METAL BASIC INDUSTRIES	19	28	27	34	20	33	27	10
381	METAL PRODUCTS	62	55	52	33	59	71	87	70
382	MACHINERY	9	11	14	11	17	19	12	17
383	ELECTRICAL MACHINERY	4	1	4	5	6	6	5	6
384	MOTOR VEHICLES AND PARTS	6	5	7	4	17	23	15	25
385	OTHER TRANSPORT EQUIPMENT	5	2	2	2	11	12	5	13
390	OTHER MANUFACTURING INDUSTRIES	50	49	49	43	43	33	80	59
	AVERAGE IIT- MAUFACTURING	28	27	30	29	36	35	40	38

SOURCE: OWN COMPUTATIONS FROM IDC (1996)
NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) Bi INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND REGIONS OF THE WORLD (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-30

SACU AND OCEANIA EXCLUDING AUSTRALIA AND NEW ZEALAND

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE		11	14	42			43	8
02100	OTHER MINING	1					1		
311-312	FOOD		0			28	36	73	94
313	BEVERAGES							3	
314	TOBACCO PRODUCTS								
321	TEXTILES		78				47	42	18
322	CLOTHING			20		16			1
323	LEATHER PRODUCTS		96					14	
324	FOOTWEAR								
331	WOOD AND WOOD PRODUCTS								1
332	FURNITURE								
341	PAPER AND PAPER PRODUCTS		2			33	-	94	1
342	PRINTING AND PUBLISHING								4
351-354	CHEMICAL PRODUCTS	99	53	8	77	16	77	28	85
355	RUBBER PRODUCTS						19		0
356	PLASTIC PRODUCTS	66	70	3			12		8
361	POTTERY, CHINA AND EARTHENWARE								
362	GLASS AND GLASS PRODUCTS								
369	OTHER NON-METALLIC MINERAL PRODUCTS						26	75	50
371	IRON AND STEEL BASIC INDUSTRIES							25	5
372	NON-FERROUS METAL BASIC INDUSTRIES				1		32		51
381	METAL PRODUCTS	41	17	82	92	17	11	19	59
382	MACHINERY	64	2	33	8	33	61	75	22
383	ELECTRICAL MACHINERY					34	97	29	15
384	MOTOR VEHICLES AND PARTS			98		4		4	90
385	OTHER TRANSPORT EQUIPMENT				23	35	5	81	62
390	OTHER MANUFACTURING INDUSTRIES	10		0	36	68	5	48	80
	AVERAGE IIT- MAUFACTURING	56	40	35	39	29	33	43	36

SOURCE: OWN COMPUTATIONS FROM IDC (1996)

NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) Bi INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND REGIONS OF THE WORLD (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-31

SACU AND SOUTH AMERICA EXCLUDING MERCOSUR

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE	19	48	94	9	30	24	3	14
02100	OTHER MINING	82	90	3	88	35	84	99	22
311-312	FOOD	9	4	4	5	12	11	3	4
313	BEVERAGES								
314	TOBACCO PRODUCTS								
321	TEXTILES	1	5	9	7	7	11	10	11
322	CLOTHING	1	2		2	21	3	2	19
323	LEATHER PRODUCTS	88	12	45	14	46	12	4	6
324	FOOTWEAR					1	86		
331	WOOD AND WOOD PRODUCTS			2	79	40	18	48	2
332	FURNITURE			32	40	1		1	1
341	PAPER AND PAPER PRODUCTS						7	95	90
342	PRINTING AND PUBLISHING	1		54	5	33	9	45	45
351-354	CHEMICAL PRODUCTS	41	57	60	56	65	61	90	91
355	RUBBER PRODUCTS				2	3	20	88	99
356	PLASTIC PRODUCTS	33	23		18		2	40	57
361	POTTERY, CHINA AND EARTHENWARE	42	27		34	88	10	13	
362	GLASS AND GLASS PRODUCTS				38	83	51	5	62
369	OTHER NON-METALLIC MINERAL PRODUCTS		3	9	3	1	2	7	2
371	IRON AND STEEL BASIC INDUSTRIES	2	7	3	1	1		4	9
372	NON-FERROUS METAL BASIC INDUSTRIES	88	82		9	39	3	2	12
381	METAL PRODUCTS	3	1	3	4	1	2	6	6
382	6	6	4	6	3	1	11	10	9
383	ELECTRICAL MACHINERY	1	1	1	20	49	2	7	2
384	MOTOR VEHICLES AND PARTS	42	16	4	16	11	3	23	57
385	OTHER TRANSPORT EQUIPMENT	64	81	84	7	31	14	34	18
390	OTHER MANUFACTURING INDUSTRIES	48	1	12	3	20	2	3	16
	AVERAGE IIT- MAUFACTURING	29	20	22	17	26	16	25	29

SOURCE: OWN COMPUTATIONS FROM IDC (1996)

NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) Bi INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND REGIONS OF THE WORLD (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-32
SACU AND SOUTH ASIA

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE	30	40	43	65	84	67	95	90
02100	OTHER MINING	17	9	43	4	5	5	6	16
311-312	FOOD	14	99	67	94	54	6	11	5
313	BEVERAGES		0	0			0	0	7
314	TOBACCO PRODUCTS								
321	TEXTILES	10	7	15	29	6	14	16	20
322	CLOTHING			0	0	0	0		0
323	LEATHER PRODUCTS	0		0		0	1	2	0
324	FOOTWEAR			4			0		1
331	WOOD AND WOOD PRODUCTS		1			79	17	26	49
332	FURNITURE		47			22		65	30
341	PAPER AND PAPER PRODUCTS	0	0	0	0	0	0	1	7
342	PRINTING AND PUBLISHING		0	1	2	0	62	16	16
351-354	CHEMICAL PRODUCTS	72	66	66	70	61	72	41	42
355	RUBBER PRODUCTS	83	67	22	25	18	47	15	18
356	PLASTIC PRODUCTS	66	86	86	74	36	35	25	20
361	POTTERY, CHINA AND EARTHENWARE			4	3	2	3		0
362	GLASS AND GLASS PRODUCTS	92	9	21	80	86	72	68	1
369	OTHER NON-METALLIC MINERAL PRODUCT	10	65	63	4	29	36	43	27
371	IRON AND STEEL BASIC INDUSTRIES	0	0	0	1	1	4	6	11
372	NON-FERROUS METAL BASIC INDUSTRIES	1	0	0	0	0	1	6	16
381	METAL PRODUCTS	48	53	54	48	91	90	63	61
382	MACHINERY	15	84	22	81	72	56	49	62
383	ELECTRICAL MACHINERY	15	98	28	81	54	47	66	42
384	MOTOR VEHICLES AND PARTS	33	22	89	24	16	67	31	95
385	OTHER TRANSPORT EQUIPMENT		5	5	77	38	19	43	97
390	OTHER MANUFACTURING INDUSTRIES	1	0	0	3	8	88	23	24
	AVERAGE IIT- MAUFACTURING	29	36	25	37	31	32	29	27

SOURCE: OWN COMPUTATIONS FROM IDC (1996)
NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) *Bi* INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND REGIONS OF THE WORLD (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS:THREE-DIGIT LEVEL.

TABLE:A-33

SACU AND SUB-SAHARAN AFRICA EXCLUDING SADC

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE	89	77	62	90	93	77	42	49
02100	OTHER MINING	57	91	97	81	81	91	32	55
311-312	FOOD	33	22	30	33	34	34	42	40
313	BEVERAGES	0	0	0	0	0	1	0	1
314	TOBACCO PRODUCTS				0		0		
321	TEXTILES	34	23	10	26	26	9	23	25
322	CLOTHING	3	3	2	4	5	4	12	3
323	LEATHER PRODUCTS	61	47	68	55	71	16	90	50
324	FOOTWEAR	2	0	0	3	6	3	2	33
331	WOOD AND WOOD PRODUCTS	74	53	63	44	34	39	60	66
332	FURNITURE	0	0	0	0	0	1	0	0
341	PAPER AND PAPER PRODUCTS	4	2	1	2	2	1	0	1
342	PRINTING AND PUBLISHING	19	2	35	43	8	26	12	4
351-354	CHEMICAL PRODUCTS	15	19	18	19	8	11	19	5
355	RUBBER PRODUCTS	0	0	0	0	0	1	6	2
356	PLASTIC PRODUCTS	1	1	3	1	1	0	1	1
361	POTTERY, CHINA AND EARTHENWARE	1	1	0	1	1	0	13	1
362	GLASS AND GLASS PRODUCTS	0	2	1	0	0	0	1	6
369	OTHER NON-METALLIC MINERAL PRODUCT	2	1	2	0	1	2	2	2
371	IRON AND STEEL BASIC INDUSTRIES	1	0	0	0	0	0	0	0
372	NON-FERROUS METAL BASIC INDUSTRIES	56	86	67	75	45	99	56	85
381	METAL PRODUCTS	1	12	1	2	3	4	1	1
382	MACHINERY	5	3	2	7	10	13	8	7
383	ELECTRICAL MACHINERY	2	4	1	14	8	11	11	4
384	MOTOR VEHICLES AND PARTS	6	16	1	6	47	33	2	3
385	OTHER TRANSPORT EQUIPMENT	10	99	16	75	28	34	17	23
390	OTHER MANUFACTURING INDUSTRIES	23	57	27	63	43	6	3	7
	AVERAGE IIT- MAUFACTURING	15	19	15	19	16	14	16	15

SOURCE: OWN COMPUTATIONS FROM IDC (1996)

NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) Bi INDEX.

INDICES OF INTRA-INDUSTRY TRADE BETWEEN SACU AND REGIONS OF THE WORLD (PERCENTAGES) FOR 1988-95 AT CURRENT RANDS: THREE-DIGIT LEVEL.

TABLE: A-34
SACU AND WESTERN EUROPE

ISIC	SECTOR	1988	1989	1990	1991	1992	1993	1994	1995
01110	AGRICULTURE	11	6	7	10	16	10	12	17
02100	OTHER MINING	5	5	5	4	3	4	4	18
311-312	FOOD	90	65	59	53	65	77	95	94
313	BEVERAGES	17	18	27	35	49	55	58	74
314	TOBACCO PRODUCTS	48	7	30	91	37	36	34	80
321	TEXTILES	77	79	80	78	80	79	61	73
322	CLOTHING	84	81	64	57	45	26	60	51
323	LEATHER PRODUCTS	74	70	95	86	75	58	59	58
324	FOOTWEAR	32	35	35	46	71	72	57	67
331	WOOD AND WOOD PRODUCTS	79	69	65	76	85	70	96	84
332	FURNITURE	34	32	32	25	22	18	29	23
341	PAPER AND PAPER PRODUCTS	91	89	99	97	96	93	91	76
342	PRINTING AND PUBLISHING	5	9	17	15	10	9	20	26
351-354	CHEMICAL PRODUCTS	26	31	26	29	34	29	33	44
355	RUBBER PRODUCTS	21	15	15	18	24	26	23	33
356	PLASTIC PRODUCTS	11	15	17	18	24	35	25	35
361	POTTERY, CHINA AND EARTHENWARE	3	4	5	10	23	6	5	25
362	GLASS AND GLASS PRODUCTS	12	19	21	27	37	40	37	31
369	OTHER NON-METALLIC MINERAL PRODUCT	12	16	22	37	39	38	39	41
371	IRON AND STEEL BASIC INDUSTRIES	37	34	37	42	47	51	60	50
372	NON-FERROUS METAL BASIC INDUSTRIES	21	19	21	21	16	27	42	60
381	METAL PRODUCTS	35	54	60	69	42	38	75	99
382	MACHINERY	8	4	6	10	17	18	10	16
383	ELECTRICAL MACHINERY	5	7	7	10	15	20	10	18
384	MOTOR VEHICLES AND PARTS	7	9	18	22	38	44	22	24
385	OTHER TRANSPORT EQUIPMENT	8	6	14	5	12	14	7	14
390	OTHER MANUFACTURING INDUSTRIES	19	45	42	23	15	24	30	26
	AVERAGE IIT- MAUFACTURING	34	33	37	40	41	40	43	49

SOURCE: OWN COMPUTATIONS FROM IDC (1996)
NOTE: THESE RESULTS WERE OBTAINED USING THE GRUBEL-LLOYD (1975) B_i INDEX.

TABLE:A-35
SUMMARY INDICES (Bi, Ci AND Qi) : 1988 TO 1995

SACU AND COUNTRIES IN THE SOUTHERN AFRICAN REGION: THREE-DIGIT LEVEL

COUNTRY	Bi	Ci	Qi	AV	Bi	Ci	Qi	AV	Bi	Ci	Qi	AV	Bi	Ci	Qi	AV	Bi	Ci	Qi	AV	Bi	Ci	Qi	AV	Bi	Ci	Qi	AV	Bi	Ci	Qi	AV
YEAR				1988				1989				1990				1991				1992				1993				1994				1995
ANGOLA	0	100	16	0	8	9	84	13.9	0	100	46	4	0	100	47	0.1	0	100	47	5	1	100	44	3	2	12	59	5	1	78	40	7
MALAWI	13	77	18	12.8	14	95	25	16.8	16	81	21	14.8	11	95	22	12.9	12	92	28	15.3	25	87	26	16.1	20	52	20	12.9	16	41	20	12
MAURITIUS	8	95	47	20	8	99	40	18.8	9	99	41	20.7	8	97	44	17.3	7	100	54	12.2	8	100	37	8	6	100	53	17.6	7	59	22	16
MOZAMBIQUE	7	91	32	8	4	100	53	5	5	100	39	9	3	97	38	8	6	91	53	7	5	100	44	5	6	100	41	9.03	6	100	31	8
TANZANIA	2	23	2	15	7	8	6	11.1	13	41	9	7.97	4	41	23	12.2	9	94	31	17	2	10	5	4	14	98	29	11.9	2	100	27	4
ZAMBIA	6	56	22	16.8	2	89	35	14.2	2	72	27	10.3	3	90	35	13.2	5	95	35	13.4	5	96	46	11.5	10	57	35	14.1	8	59	28	14
ZIMBABWE	39	72	44	44.6	39	81	51	42.8	36	83	55	43.8	26	83	53	37.2	39	70	41	47.4	32	71	46	41.6	33	68	45	37.2	21	70	43	37
REST OF SADC EX ZIMBAWE	30	92	51	43.2	25	92	57	36.1	22	90	56	31.5	15	92	54	24.5	25	92	51	32.7	22	95	53	28.7	27	90	52	32.2	20	94	48	30
ROW	33	47	39	40.4	35	44	51	43.4	38	40	42	47.8	40	49	43	51.1	44	52	48	53.5	45	52	47	54.6	45	59	51	55.2	48	59	53	53

SACU AND COUNTRIES IN THE SOUTHERN AFRICAN REGION: FOUR-DIGIT LEVEL

COUNTRY	Bi	Ci	Qi	AV	Bi	Ci	Qi	AV	Bi	Ci	Qi	AV	Bi	Ci	Qi	AV	U	A	Qi	AV	Bi	Ci	Qi	AV	Bi	Ci	Qi	AV	Bi	Ci	Qi	AV
YEAR				1988				1989				1990				1991				1992				1993				1994				1995
ANGOLA	0.01	100	7.99	0	6	8	6	10	0	94.5	2	1	0	100	6	0	0	93.6	22	2	0.98	100	12	2	0.61	4.77	2	2	0.45	29.4	5	2
MALAWI	7.99	46.8	10	11	7	46.3	15.9	9	8	40.6	14.6	10	9	76.2	16.8	9	10	71.7	19	13	13	45.8	14.9	10	13	32.8	11.9	12	12	30	13.4	13
MAURITIUS	6	72	24.5	15	6	67	26	13	7	70	29.7	15	7	88	30.4	18	7	96	32.6	12	4	52	22.2	8	5	78	23.5	11	6	50	18	12
MOZAMBIQUE	6	80.3	12.7	6	4	100	26.1	4	5	88.2	18.8	6	3	76.5	15.9	4	5	71	21.4	5	5	100	21.1	4	6	100	24.8	7	6	100	30.2	6
TANZANIA	2	1	25	7	5	6	21	9	0	1	14	1	2	18.3	16	6	6	61.6	25	13	2	6.58	16	5	11	74.8	24	8	1	47.8	27	4
ZAMBIA	5	47.1	13.4	11	2	81.7	21.8	9	1	60.6	19.6	6	2	79.9	26.5	8	4	85.4	29	7	4	84.5	41.4	6	9	52.2	25.7	8	7	53.5	20.1	8
ZIMBABWE	29	54	34.6	30	31	65	42.1	33	29	68	41.9	31	20	64	41.6	27	30	53	35.4	36	26	58	39	33	28	56	39.4	32	19	63	35.8	33
SADC AS A WHOLE	33	100	39.3	31	27	100	47.1	28	24	100	45.8	27	17	100	44.3	21	27	100	55.3	25	23	100	45.5	25	30	100	42.8	28	21	100	42.5	25
ROW	28	40	34	33	30	38.6	35	36	33	41	37	40	36	43.3	39	41	38.9	45.8	42	44	39.6	46.6	43	46	38.8	50.9	42	50	40.2	49.7	43	47

SACU AND REGIONS OF THE WORLD: THREE-DIGIT LEVEL

REGIONS	Bi	Ci	Qi	AV	Bi	Ci	Qi	AV	Bi	Ci	Qi	AV	Bi	Ci	Qi	AV	Bi	Ci	Qi	AV	Bi	Ci	Qi	AV	Bi	Ci	Qi	AV	Bi	Ci	Qi	AV
YEAR				1988				1989				1990				1991				1992				1993				1994				1995
AUSTRALIA AND NEW ZEALAND	50	73	61	49	41	63	96	45	49	66	96	46	49	71	96	45	49	61	90	51	50	60	95	51	46	64	92	43	55	55	94	57
BRAZIL	44	94	52	19	32	64	36	24	33	69	43	24	44	74	51	28	61	99	62	38	55	73	57	41	49	58	42	34	62	62	55	36
CARIBBEAN	7	13	15	22	9	18	18	22	6	10	12	28	16	36	29	22	39	40	42	40	52	56	58	33	19	41	2	36	61	61	41	37
CENTRAL AMERICA	15	16	0	37	5	7	15	14	9	15	11	38	14	35	17	46	5	13	13	24	19	29	12	28	8	17	15	37	31	31	28	27
CHINA AND MACHAU	19	96	44	26	6	27	31	10	5	18	19	8	12	45	31	12	18	24	20	17	14	24	18	10	15	43	30	19	39	39	28	18
EAST ASIA	28	33	28	31	30	34	24	32	29	30	24	41	31	32	25	38	29	31	28	38	29	33	29	35	25	30	24	32	35	35	31	31
EASTERN EUROPE	3	12	19	8	13	47	36	24	22	33	28	21	35	44	41	36	39	49	42	41	43	70	50	37	30	72	45	37	52	52	35	28
JAPAN	14	35	24	22	16	33	38	25	18	35	24	30	18	36	23	28	16	35	24	26	11	32	20	28	12	33	25	27	24	24	18	24
MERCOSUR EXCLUDING BRAZIL	11	14	11	42	12	30	34	20	12	26	23	29	22	24	15	30	23	24	19	41	26	34	20	31	18	26	19	32	35	35	31	68
MIDDLE EAST	42	64	16	37	39	62	54	46	27	59	4	38	25	51	4	37	26	59	12	33	38	62	29	37	45	53	35	41	53	53	42	48
NORTH AFRICA	1	8	37	18	2	18	27	34	1	6	29	12	1	9	42	21	16	53	2	41	14	46	1	41	35	67	9	32	72	72	38	33
NORTH AMERICA	23	41	32	28	21	39	41	27	23	45	34	30	23	52	37	29	37	60	45	36	33	50	41	35	35	58	45	40	50	50	39	38
OCEANIA EXCLUD. AUST AND NZ	5	8	18	56	1	12	27	40	1	11	33	35	4	23	37	39	9	17	3	29	26	37	20	33	43	43	38	43	47	47	37	36
S.AMERIÇA EXCLUD. MERCOSUR	8	24	26	29	9	10	33	20	7	10	8	22	7	9	11	17	11	15	1	26	11	23	1	16	22	23	12	25	28	28	31	29
SOUTH ASIA	13	14	8	29	29	31	47	36	25	27	15	25	28	30	13	37	21	22	16	31	24	24	21	32	19	21	8	29	27	27	30	27
SUB-SARAH AFRICA	16	74	24	15	21	82	41	19	15	85	18	15	18	91	25	19	15	94	8	16	15	33	1	14	12	32	16	16	40	40	18	15
WESTERN EUROPE	24	37	27	34	26	44	45	33	28	49	35	37	29	43	33	40	30	39	33	41	32	39	34	40	31	47	36	43	54	54	41	49
SADC EXCLUDING ZIMBABWE	30	92	36	43	25	92	69	36	22	90	42	32	15	92	34	25	25	92	47	33	22	95	47	29	27	90	45	32	94	94	60	30

SOURCE: OWN COMPUTATIONS FROM IDC (1996)

BEL-LLOYD (1975) Bi AND Ci AND AQUINO (1978),QI INDICES.

AV= AVERAGE GRUBELLOYD (1975) INDICES.

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