THE IMPACT OF TARIFF LIBERALISATION ON THE COMPETITIVENESS OF THE SOUTH AFRICAN MANUFACTURING SECTOR DURING THE 1990s

by

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PREFACE

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To Lorraine, Lucretia and Lynton

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ABBREVIATIONS

ANC	African National Congress
BTT	Board of Tariffs and Trade
CITA	Commission for International Trade Administration
DTI	Department of Trade and Industry
EC	European Commission
EU	European Union
FDI	Foreign direct investment
GATT	General Agreement on Tariff and Trade
GEIS	General Export Incentive Scheme
ICTs	Information and Communication Technologies
IDC	Industrial Development Corporation
ILO	International Labour Organisation
IMF	International Monetary Fund
MIDP	Motor Industry Development Programme
MNCs	Multinational Corporations
Nedlac	National Economic Development and Labour Council
NEF	National Economic Forum
NTBs	Non Tariff Barriers
R&D	Research and Development
RDP	Reconstruction and Development Programme
REER	Real effective exchange rate
SACU	South African Customs Union
SADC	Southern African Development Community
TIPS	Trade and Industrial Policy Strategies
ULC	Unit labour cost
WTO	World Trade Organisation

Abstract

During the 1990s, South Africa's trade policy was drastically reformed. This mainly entailed rapid tariff liberalisation agreed to under the General Agreement on Tariffs and Trade (GATT) in 1994, and implemented from 1995 onwards under the auspices of the World Trade Organisation (WTO). South Africa's trade policy reform was premised on the assumption that tariff liberalization would increase the competitiveness of domestic manufacturing industries. The thesis attempts to ascertain if this did in fact materialise by critically appraises the impact of trade policy reform on the production of the South African manufacturing sector. The results indicate that tariff liberalisation has not been successful in securing improved competitiveness. The thesis argues that improved competitiveness goes beyond trade policy reform — government polices should also be directed at issues relating to efficiency in production, distortions in factor markets and institutional development. The desired or appropriate level of openness does not necessarily entail completely free markets for trade and investment. In the light of market and institutional failures the role of government in securing the appropriate industrial outcomes should not be underestimated.

Keywords: trade policy, tariffs, effective rate of protection, industrial policy

CHAPTER ONE

INTRODUCTION AND JUSTIFICATION FOR THE STUDY

1.1 Background

Various arguments have been advanced in favour of trade liberalisation. The Heckscher-Ohlin theory maintains that free trade encourages specialisation in the production of goods in which a country has a comparative advantage. Specialisation in the production of goods in which a country has a comparative advantage promotes efficiency in the allocation and use of resources which in turn facilitates trade and improved welfare. Even factors of production used in the production of tradeable goods are said to benefit from trade through the equalisation of factor prices internationally (Samuelson, 1948).

The belief that an outward oriented trade policy is superior to an inward-looking or protectionist stance has been vociferously argued in the economic growth literature (Krueger, 1998; Dollar, 1992; Sachs and Warner, 1995). Wang and Winters (1998) argue that this is also the case for Africa. While the notion that export production is conducive for economic growth is well established, the path to export production has been contested in the economic literature. The East Asian experience has shown that the path to export production may indeed be via import substitution (Amsden, 1989; Wade, 1992; Ocampo and Taylor, 1998). Further, new trade theory with its emphasis on imperfect competition, economies of scale and more recently on geographic influences on trade patterns, has shown that comparative advantage may not be solely dependent on factor endowments. Strategic interventions may be required to secure comparative advantage in the production of certain goods and services. The belief that trade liberalisation is desirable is based on the notion that it promotes efficiency gains in the allocation and use of factor resources.

However, the link between trade liberalisation and economic growth has been questioned (Rodriguez and Rodrik, 1999; Hanson, 1998).[1] The consensus in the academic literature is that when protection is justified, empirical evidence (as in the case of the East Asian experience) and theoretical considerations (e.g. new trade theory) dictate the use of selective rather than "across the board" protection.[2] It could be argued that this is, and has always been the case in practice. The policy of protection is almost always selectively applied in the sense that differing rates or forms of protection are accorded to industries.[3]

Even, liberalisation within the context of the rules of the World Trade Organisation (WTO) is usually not uniform across industries or sectors, which in some sense, confirms the use of the selectivity criterion in the application of the policy of protection. If selective intervention has been the characteristic of trade policy then why has it not been successful? The answer lies in the selection of industries that are protected, the policy instruments used and the magnitude of the protective measures implemented. In addition the impact of policy depends on prevailing market conditions. Hence, it is imperative that the impact of policy is evaluated in order to ensure that the perceived benefits have been realised. This study attempts to do this. It analyses whether a specific objective of South Africa's trade liberalisation during the 1990s, namely, to promote competitiveness, has been realised.

1.2 The rationale for trade liberalisation in South Africa

Since the early 1970s there has been an emphasis on export-oriented industrialisation in South Africa. The policy during the 1970s and 1980s was to promote export production mainly through the granting of export incentives. The Reynders Commission, for example, while recommending a diversification of the export base away from gold exports did not view import liberalisation as a necessary condition for non-gold export production (Bell,

[1] However, the main critique rests on the tests undertaken in the study rather than on the proof that trade liberalisation does not lead to economic growth.
[2] Although, Krugman (1987) argues that free trade should be preferred as a rule of thumb since the scope for strategic policy is very limited.
[3] The issue boils down to getting the selection right, which is the crux of economic policy.

1996: 71). In 1972, a tax allowance for export marketing expenses was one of the first direct export incentives introduced by the government. This was followed by a new system of export incentives introduced in September 1980.

By the beginning of the 1990s, the official policy stance was one of export-oriented industrialisation. The General Export Incentive Scheme (GEIS) was introduced on 1 April 1990 with the objective of encouraging the production of value added exports. However, while export subsidies were used to reduce the anti export bias in the economy, the view that the path to export production should entail trade (and more specifically tariff) liberalisation began to gain ground. This is evident in the recommendations made by an official investigation into South Africa's tariff protection policy.

> *"The reduction of import tariffs is therefore an integral part of a process of progress towards export orientation" (IDC, 1990: i–ii).*[4]

With the transition to democracy in South Africa, the policy of an export oriented trade strategy underpinned by tariff liberalisation was firmly entrenched. This is clearly borne out in the Growth, Employment and Redistribution (GEAR) strategy, which asserts that:

> *"…sustained growth on a higher plane requires a transformation towards a competitive outward-oriented economy" (*RSA, 1996: 3)*.*

South Africa's growth prospects depended on:

> *"…strengthening the competitive capacity of the economy in the long term"* (RSA, 1996: 7).

In this regard trade policy was important. More specifically, trade policy was to be characterised by:

[4] The minister of trade, industry and tourism commissioned the Industrial Development Corporation, in collaboration with the Board of Trade and Industry, to *"…investigate the efficacy of the existing tariff protection policy" (IDC, 1990: ii).*

*"…a reduction in tariffs to contain input prices" (*RSA, 1996*: 4).*[5]

The stated intention of government's trade policy during the 1990s is elegantly summarised in a recent policy document in which it is asserted that:

> *"…significant trade reforms took place in order to open the economy and create opportunities for growth and improved competitiveness…In general, the tendency was towards a lowering and simplification of tariffs. This process took place from 1995 and was largely completed in 2002" (DTI, 2002: 11-12).*

From the above analysis, it is apparent that the justification for South Africa's liberalisation policy was based on the notion that protection (e.g. tariffs) resulted in price distorting effects, which adversely impact on competitiveness. Viewed in this way, tariff liberalisation is meant to ensure price or cost competitiveness. Given South Africa's re-entry into the global arena with the ending of sanctions in 1990 and the wide ranging tariff liberalisation programme agreed to under the WTO agreement, South Africa's liberalisation programme of the 1990s provide fertile ground for an analysis of whether tariff liberalisation did in fact result in improved competitiveness.

1.3 A brief review of the empirical work on the effects of tariff liberalisation during the 1990s

Historically, the development of the manufacturing sector was based on a policy of import-substitution for infant industry (Holden, 1992, 1995). Empirical evidence reveals that there has not always been a robust positive relationship between foreign trade and economic growth in South Africa (Strydom, 1995a).[6] This is especially the case for the period 1981-91 (Strydom and

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[5] It is interesting to note that the objective of striving for international competitiveness is not meant to be isolated from social objectives. In fact one of the stated intentions of economic policy is *"to support a competitive and more labour-intensive growth path"* (RSA, 1996: 7).

[6] For a review of South Africa's earlier trade policy stance see *inter-alia* Scheepers (1982); Holden (1992); Bell (1993, 1997) and Belli et al (1993).

Fiser, 1995) when South Africa's international competitiveness deteriorated quite significantly relative to earlier periods (Holden, 1993).

Trade liberalisation has been a characteristic of trade policy since the early 1970s with the reduction of quantitative restrictions being the main policy instrument as far as imports were concerned (Bell, 1997). By the early 1990s there was strong support for South Africa's industrial strategy being spearheaded by comprehensive tariff reductions (IDC, 1990; Levy, 1992). Bell (1993) contends that this support was motivated by political economy considerations given that it was a foregone conclusion that there was going to be a change in the political regime.[7] However, the extent to which political economy considerations influenced the tariff liberalisation process is difficult to determine given the strong presence of the African National Congress (ANC) within the National Economic Forum (NEF) which was tasked with determining the offer to the General Agreement on Tariff and Trade (GATT).

South Africa's tariff liberalisation began in earnest with the offer to the GATT in 1994 and implementation in 1995. In terms of this offer there was a concerted effort to rationalise the tariff schedule (IMF, 1998,) from one that was amongst the most complex in the world (Belli et al, 1993) to one that *"…substantially liberalized the economy through import tariff reform"* (Tsikata, 1999: 1). There was a firm belief that the GATT offer promoting import liberalisation through tariff reductions was conducive to the promotion of the manufacturing sector and the economy as an whole (Joffe et al 1995; DTI, 1995).

It has been argued that despite a large increase in import penetration with trade liberalisation there is no evidence of de-industrialisation (Fedderke and Vaze, 2001; Tsikata, 1999). Trade liberalisation is also credited with having promoted efficiency in the manufacturing sector production (IMF, 1998: 48). However the IMF study acknowledges that while there exists a strong positive

[7] Bell (1993) cites Michaely et al (1991) who found that a trade liberalisation programme is usually implemented with a change in political regime in developing countries.

correlation between trade openness and productivity growth in South Africa, total factor productivity of the manufacturing sector has lagged behind that for the economy as a whole, mainly due to the high levels of effective protection in the manufacturing sector (IMF, 1998: 50). Tsikata (1999: 19) asserts that trade liberalisation caused a shift in relative prices and incentives with a result that "…exports of manufactures have expanded rapidly and become more diversified".[8]

It has also been found that export oriented sectors have achieved higher levels of output and productivity gains than import-competing sectors, thus suggesting that tariff liberalisation was beneficial (ILO, 1998). This study also claims that since employment was in decline before 1995, employment losses cannot be mainly attributed to trade liberalisation. Using firm level data on applications made to the Board on Tariffs and Trade (BTT), Holden and Casale (2000) find that the BTT, in granting protection during the period 1990-98, was sensitive to the adverse effects of the tariff liberalisation process, particularly with regard to employment considerations.

However, the benefits of tariff liberalisation have been contested. Roberts (2000) argues that tariff liberalisation failed to promote economic growth, improve trade performance and create employment. Although export-oriented companies have increased their investment rates, the contribution of rising exports to the growth trajectory during the 1990s, particularly in terms of output and employment, has been disappointing (Holden, 2001b). The government (DTI, 2002: 24) has also confirmed that the industrial policies have not had the desired impact on the growth rate and employment creation. From 1990 to 2000, manufacturing value added (MVA) increased at an average rate of 1.5 percent, significantly lower than the overall economy (2.2 percent) and the services sector (2.8 percent) (TIPS, 2002). MVA remained fairly constant for this period, while there was a steady increase for the services sector since 1995. In addition, contrary to expectations, exports were

[8] Tsikata (1999: iv) cites that the food, textiles, clothing and footwear were the exceptions. These sectors experienced declines in exports.

not unskilled labour intensive (Tsikata, 1999; Lewis, 2001). This is taken to mean that *"South Africa is not taking full advantage of its comparatively abundant labour supply"* (Tsikata, 1999: v). However, if a distinction is drawn between South African trade flows to developed and developing or emerging countries, then this contradiction does not exist. Exports are unskilled labour intensive to developed countries, but skill intensive to developing or emerging countries (IMF, 2000). In addition, the limited employment creation that has resulted during the 1990s, has been biased towards skilled workers, suggesting that the full potential from expanding trade has not been realized (Lewis, 2001).[9] Fedderke (2001) and Edwards (2001) argue that trade has had a positive impact on employment creation, but technological factors have offset some of the gains from trade.

Analysis of changes in South Africa's competitiveness has been done on the basis of international cost and price comparisons. The empirical work has concentrated on international competitiveness by analysing movements in the real effective exchange rate (REER) or labour cost comparisons. Declines in the REER have served to increase the competitiveness of South African exports (Fallon and De Silva,1994; Tsikata, 1999; Golub, 2000).[10] Unit labour cost (ULC) comparisons show that South African labour costs are competitive relative to developed countries, but uncompetitive relative to developing countries (Golub, 2000).[11] In addition, cost competitiveness is found to be a strong determinant of manufacturing export volumes (Golub and Ceglowski, 2002). While relative unit labour cost and REER comparisons are common in the analysis of competitiveness, it is important to realise that they are highly sensitive to exchange rate changes and as such may mask the effects of trade policy on competitiveness. Also, an aggregate competitiveness indicator (like the REER and ULC) may not accurately depict competitiveness at the sectoral level, particularly for countries like South Africa where production

[9] Bhorat (2000) has found similar results for the period 1970-1995.

[10] For a review of the methodological issues relating to the calculation of the REER for South Africa see (Kahn, 1998; Walters and de Beer, 1999).

[11] The study found that while South Africa's labour productivity was lower than that of developed countries, the labour costs were relatively much lower with a result that South African labour costs were competitive *vis-à-vis* developed countries.

may be commodity intensive (Wood, 1995; Bell et al, 1999). The empirical analysis to date on the South African economy has also not specifically analysed the impact of trade liberalisation on the REER and ULC.

To date the empirical work on South African trade policy has produced mixed results. Hence *"…the impact of trade policy reform on the South African economy remains a contentious issue"* (TIPS, 2002: 55). Against this background, empirical work on the effects of trade policy reform will be of particular relevance for policy makers and academics in the foreseeable future.

1.4 The main and sub hypotheses of the study

As highlighted above, significant trade (tariff) liberalisation has been undertaken during the 1990s in order to promote competitiveness. However, the role of tariff liberalisation in promoting competitiveness has not been explicitly analysed. In fact, government has recently stated that:

> *"…there is a need for a thorough review of the role of tariffs in competitiveness"* (DTI, 2002: 33).

This study attempts to do just that. The main hypothesis that will be analysed in this study is:

> South Africa's tariff liberalisation policy in the 1990s has contributed to improved competitiveness of the South African manufacturing sector.

This will be accomplished through a critical appraisal of the following sub-hypotheses:

- The trade incentives of the 1990s created a significant anti-export bias in manufacturing production.
- Tariff liberalisation gave rise to the anticipated price effects as measured by the real exchange rate (RER).

- Tariff liberalisation had a significant positive impact on price competitiveness in South Africa.

1.5 Research Methodology

The methodological and analytical basis for this study is drawn from the empirical literature focusing on trade liberalization and economic growth. An extensive review of the theoretical and empirical literature underpins the analysis for the South African manufacturing sector. Descriptive statistics and econometric techniques are used to derive the results in this study. An econometric model is constructed which forms the basis of the test of the main hypothesis. The methods and analytical techniques employed in the study are highlighted in each of the chapters in which they are used and their limitations are also clearly spelt out. Graphic illustrations and tables also support the results obtained in this study. The policy implications of the results and areas that warrant further research are highlighted in the last chapter.

1.6 Structure of the study

The study is structured as follows:

- Chapter 2 undertakes an analysis of trade theory and it's implications for competitiveness. This chapter highlights the policy implications for competitiveness of the different trade theories.

- Chapter 3 provides a critical appraisal of the theory of protection and it's implication for competitiveness. This chapter considers the empirical evidence on the links between tariff liberalisation and competitiveness and also provides a definition of the concept of competitiveness that underpins the empirical analysis in this study.

- Theory stipulates that the extent of tariff liberalisation will influence competitiveness. Recently it has been asserted that *"…more of South Africa's output is protected by tariffs in 1998 than in 1988"* (Fedderke and Vaze, 2001:447). Chapter 4 critically analyses the extent of tariff liberalisation during the 1990s in the light of this assertion.

- Within a two sector model (tradables and non tradables) the price raising effects of import protection serve as a disincentive to export (anti-export bias). Chapter 5 evaluates the conventional measure of anti-export bias within a three sector model (importables, exportables and non-tradables) for South Africa during 1990s. In this chapter a test of the hypothesis of whether the trade incentives of the 1990s created a significant anti-export bias in manufacturing production is undertaken.

- Chapter 6 considers whether tariff liberalisation effects have fed through to the prices of domestic producers. The hypothesis that tariff liberalisation gave rise to the anticipated price effects as measured by the real exchange rate (RER) is tested in this chapter. The results of this chapter provide the first tentative indications of the impact of tariff liberalisation on price competitiveness.

- Chapter 7 extends the analysis of the previous chapter by considering a more rigorous econometric analysis of the impact of tariff liberalisation on prices and competitiveness. Panel data evidence for the manufacturing sector for the 1990s is considered. The methodology employed incorporates recent developments in the application of unit roots and cointegration in panel data estimation. This chapter tests the hypothesis that tariff liberalisation had a significant positive impact on price competitiveness in South Africa.

- Improved competitiveness could entail a change in the composition of products produced (e.g. production of higher technology or higher value added products). Chapter 8 attempts to ascertain if the production of the trade liberalising sectors displays any characteristics of improved competitiveness.

- Finally, some conclusions and policy recommendations are made in chapter 9.

CHAPTER TWO
TRADE THEORY AND ITS IMPLICATIONS FOR COMPETITIVENESS

2.1 Introduction

International competitiveness, within the context of trade in goods and services, refers to a nation's trade advantage *vis-à-vis* the rest of the world. In this regard, trade advantage occurs whenever the economic welfare of a nation improves as a result of trade (Coldwell, 2000: 418). Trade theory asserts that economic welfare is dependent on the production of goods and services that a country has comparative advantage in. This in effect means that international competitiveness is secured when production is in line with a country's comparative advantage situation. This is the point of departure for this chapter. What does trade theory have to say about comparative advantage and hence international competitiveness? In summary, trade theory advocates that international competitiveness (comparative advantage) is *inter alia* determined by factor endowments, increased savings and investments, innovations in products and production processes and intensity of entrepreneurial activity. This chapter considers these issues in more detail.

2.2 Brief overview of traditional trade theory

For analytical convenience, trade theory can be classified into two categories namely, traditional theory (which has a neoclassical foundation) and new trade theories. Traditional trade theory incorporates the principles of perfect competition, homogenous goods and constant returns to scale in production. This would include the trade theories of Smith, Ricardo, Heckscher and Ohlin and the modifications or extensions of the Heckscher-Ohlin theory.[1] The new theories of international trade on the other hand would include theories

[1] The extension of the Heckscher-Ohlin theorem would in the main include the factor price equalisation theorem, Stolper-Samuelson Theorem, Specific factors theorem and Rybczynski theorem. For a good review of these theories, see inter alia, Chacholiades (1990).

characterised by product differentials, imperfect competition and increasing returns to scale.

Trade theories have *inter alia,* attempted to explain three issues:

- The pattern of trade where the emphasis has been on explaining the basis of trading relations;
- The sources of gain from trade where the emphasis has been on explaining how the gains from trade are distributed among trading partners; and
- The structure of production and returns to factors of production where the emphasis has been on explaining the implications of trade for the structure of production and returns to factors of production within each trading country.

Some of the basic assumptions underlying conventional trade theories include:

- Trading relations are restricted to two countries each having a fixed stock of factors of production;
- Factors of production are perfectly mobile among industries within a country but completely immobile internationally;
- There are no transport costs in trade;
- All traded products are final products;
- Both factor and product markets are characterised by perfect competition with producers maximising profits and factor returns at a level that ensures full employment of all factors;
- Technology is such that production is characterised by constant returns to scale; and
- Consumers everywhere have identical homothetic utility functions.

Given these assumptions the following predictions emanate from conventional trade theory:

- *Adam Smith's theory of absolute advantage:* For Smith, trade facilitates a more intense application of the division of labour in the production process, which, in turn provides the main underlying condition for economic growth. Hence, economies of scale in production is the main facilitator of trade.[2] According to the theory of absolute advantage, a country specialises in the production of those goods in which it has an absolute advantage and trades these for goods in which it does not have an absolute advantage. In an ideal Smithian world, there is an efficient allocation of resources with *"laissez-faire"* policies and production is specialised in the *single* product in which the country has an absolute advantage.
- *Ricardian model of comparative advantage:* In a Ricardian world, trade is determined by relative and not absolute efficiency in production. Unlike the theory of absolute advantage, it can be shown that it will be in the interests of every country to engage in trade since every country will find a product in which it has a comparative advantage. Once again specialisation in production would occur and because trading countries face the same relative prices, specialisation would occur in different goods, thus facilitating exchange between the two trading countries. *Laissez faire* policies would ensure production in goods in which the country has a comparative advantage. It is differences in technology that determine the goods in which the country has a comparative advantage.
- *Heckscher-Ohlin (H-O) model:* The assumption that technologies are identical across countries is basic to the H-O model and is a major point of departure from the Ricardian model. In the theories of absolute and comparative advantage, there is an implicit assumption of one factor of production, thus, leaving the question of the effects of trade on a country's factoral distribution of income unanswered. According to the

[2] While Adam Smith acknowledged the importance of economies of scale as a motivation for trade between countries, his use and analysis of the concept was very rudimentary and lacked the rigor and comprehensiveness of the new trade theorists.

Hechscher-Ohlin model the country exports those goods which intensively uses it's abundant factor and imports those goods which are intensive in its scarce factor. This result emanates from the assumption that factor supplies determine factor prices - however, in the real world the relationship between factor supply and price may not be so simplistic.[3]

The following theorems following from the H-O model:

- *Factor price equalisation theorem*: Trade equalises factor prices internationally. Given identical technologies of production throughout the world, the equalisation of the domestic product price ratio with the international free trade price ratio will tend to equalize factor prices across trading countries.
- *Stolpher-Samuelson theorem:* A small increase in the relative price of the capital-intensive product increases (reduces) the return to capital (labour) in terms of both products.
- At constant relative prices, small increases (reduction) in an economy's capital/labour endowment ratio will increase (reduce) the output of the relatively capital (labour) intensive good, relative to both factors. This is known as *Rybczynski's theorem* which attempts to highlight the link between changes in factor endowments and changes in the compositon of output at given product prices.

2.2.1 Criticisms of Traditional (neoclassical) trade theories

[3] It is possible, for example, that rigidities in the labour market (e.g strong trade union presence) or government policies (e.g. large depreciation allowances) designed to favour capital expenditures could call into question the factor endowment theorem for a labour abundant country.

The underlying assumptions supporting conventional trade theories have been called into question. In this section these assumptions are listed and then a brief overview of the criticisms is provided.

- Resources are country specific and constant in quality and in full employment across countries.
- Technology is either fixed (classical model) or similar and freely available (factor endowment model) to all nations.
- Perfect competition prevails. Factors of production are perfectly mobile between different production activities.
- Governments play no role in international economic relations so that trade is strictly carried out among anonymous producers who have as their sole motive the minimisation of costs and maximisation of profits. International prices are the result of the interaction of supply and demand.

Some of the criticisms emanating from these assumptions are elaborated on below.

- Factor resources

Conventional trade theory assumes that factor resources are fixed in quantity, constant in quality across nations, fully employed and not mobile across countries. As far as the mobility of factor resources is concerned, it is well recognised that one major phenomenon of production in the nineteenth and twentieth century relates to the mobility of factor resources. The proliferation of multi-national corporations (MNCs) over the last century has manifested itself in the transfer of capital, skilled labour and technology across nations. Trade has been one of the main determinants of unequal growth of productive resources in different nations. This is especially the case for resources such as physical capital, entrepreneurial abilities, scientific capacities and upgrading of technological skills of the labour force. Thus, factor endowments and comparative costs are subject to a state of change.

- Fixed technology

Rapid technological change is an important characteristic of our modern world economy. The development of synthetic substitutes (rubber, wool, cotton, sisal, jute, hides and skins) for example, by the developed countries have had a profound effect on third world economies. Hence the strict adherence to the principle of fixed technology would mean that the third world countries would continue producing primary goods for which world demand has decreased.

- Assumption of perfect competition.

Resource allocation between production activities is not instantaneous and costless as traditional theory would lead us to believe. Increasing returns to scale is a common feature of the production process. Similarly, monopolistic and oligopolistic market control of internationally traded commodities mean that large individual corporations are able to manipulate world prices and supplies. Thus, joint producer activities and oligopolistic bargaining among giant buyers and sellers are important determinants of price and quantity on the international market.

Also, the exclusion of risk under perfect competition is unrealistic. If developing countries, for example, were to specialise in primary commodities (goods in which they have a comparative advantage) then the risks associated with adverse movements in the terms of trade also has to be borne by them.

- Role of governments

It is because of the non-existence of perfect competition and instantaneous adjustment of product and factor markets that governments play an increasingly important role in international economic relations. The optimum tariff argument suggests that a country having a dominant role on the international market (in terms of manipulation of prices) may find it

advantageous to impose tariffs. As pointed out earlier, unemployment may also justify government intervention. It should also be noted that the benefits of trade may not be equitably distributed. Whether trade is beneficial or not depends on the nature of the export sector, the distribution of its benefits and its linkages with the rest of the economy. Hence government intervention may not only be justified, but also necessary to secure the benefits from trade. The existence of imperfect competition (a characteristic of the modern world) necessitates an increasingly important role for government in international economic relations (the nature of this intervention will be explored in more detail in the next chapter).

2.2.2 Relaxing some of the common assumptions

Relaxing some of the common assumptions give rise to the following:

- *Factor intensity reversals*: With factor intensity reversals (i.e. a product is relatively capital intensive at some factor price ratios and relatively labour intensive at others), the H-O theorem is violated since depending on factor returns, a labour intensive country could be exporting capital intensive goods at certain factor price ratios.
- *Differences in tastes:* If a labour abundant country has a large taste bias towards relatively labour intensive goods, then trade will be opposite to that predicted by the H-O theorem.
- *Differences in technological capabilities:* As pointed out earlier, the H-O model is based on the restrictive assumption of identical technology across countries. However, the influence of technological differences on the pattern of trade is well documented in the economic literature.[4] Technology differences can be divided into two major categories (Falvey, 1994)[5]:
    - *Product augmenting* technology differences exist when increased output can be produced from a given factor input

[4] See Markusen and Svensson (1985) for a survey of the literature.
[5] It may very difficult distinguishing between the two in practice.

in some sector(s). The effects in this case are similar to changes in product prices.

- *Factor augmenting* differences exist where a factor(s) in one country is more productive than the same factor(s) in another country - this is independent of the sector in which the factor is employed. Factor augmenting technical changes act very much like factor endowment changes.

If technology differences are purely factor augmenting, the trade pattern could be explained in terms of "effective" factor endowments by adjusting units of measurement to take account of the effects of technology differences on factor productivity (Falvey, 1994). However, in the case of factor augmenting effects, the underlying motivation for trade may have more to do with technological differences than factor endowments.

- *Transport costs* could give rise to intra-industry trade (trade in similar products).
- The existence of *intermediate products* introduces the possibility of international trade in inputs (Ethier, 1979; Chacholiades, 1979) which is ignored in the traditional trade models.[6]

2.2.3 Implications of traditional theory for competitiveness

Conventional theory advocates that trade is an important stimulant for economic growth. It enlarges a country's consumption capacities and provides access to scarce resources and world markets, which in turn facilitates growth. There are potential gains to be derived from trade as long as the terms of trade differ from autarky relative prices.

The distribution of the gains from trade will depend on the pattern of factor use in production as well as the pattern of factor ownership. According to the

specific factors model (where one factor is sector specific and the other is mobile across sectors), an increase in the relative price of a product increases the real return to the factor specific to that sector and reduces the real return to the factor specific to the other sector. In essence this means that relative price changes result in a winner and loser (in terms of factor returns). The implication here is that a country can influence (through subsidies, tariffs, depreciation allowances, etc.) the pattern of income distribution by influencing the relative prices of goods. The alternative scenario is where trade is promoted but distributional mechanisms (e.g. tax policy) are set in place to ensure a fair and equitable distribution of the benefits.

Trade volumes will be positively correlated with differences in factor endowments (measured either in price or quantity terms as in the H-O model). Here it is asserted (H-O model) that the trade pattern will reflect differences in endowments on average. What this implies is that if a labour abundant country is not exporting labour intensive goods then it's trade policy is distorted. This distortion is due to restrictive trade practices. Stated differently, factor endowment theory would lead one to believe that free trade policies result in factor endowments being the main determinant of comparative advantage. International trade (international prices and costs of production) determines a country's trade pattern. Free trade (i.e. market forces) establishes a country's comparative advantage.

Thus, an outward looking international policy is required for economic growth. Self-reliance and autarky are asserted to be economically inferior to participation in a world of free trade. Trade promotes international and domestic equality by equalizing factor prices, raising real incomes (raising relative wages in labour-abundant countries and lowering them in labour

[6] Thus, since factors are used in production both directly (in value added) and indirectly (through intermediate inputs) there are two measures of "factor intensity" direct (value added only) and total factor intensity (direct plus indirect).

scarce countries) of trading countries and promotes the efficient use of the country's resources. Thus, in essence, traditional trade theory advocates a *"laissez faire"* policy – market forces or free trade is the best determinant of trade patterns.

In summary, the lessons of the conventional theories of international trade are that the specialisation in products of comparative advantage, accumulation of resources, innovation of productive processes and the intensity of entrepreneurial activity, determine a country's international competitiveness. In addition, the conventional models advocate free trade as the main proponent of improved competitiveness.

2.3 New trade theories

Comparative advantage justifications for international trade imply a strong tendency for trade between countries with large differences in technology or factor endowments. However, it has been shown that this is not always the case – in many cases trade flows are greatest between countries with similar technological capabilities or factor endowments (Smith, 1994).[7] A large part of international trade is conducted between the countries of Western Europe, North America and Japan. The principle of comparative advantage (as advocated by conventional trade theory) does not allow for a country having both a comparative advantage and comparative disadvantage in the same goods. Even if one allows for statistical classifications (where dissimilar goods may be aggregated for statistical convenience) it is still not possible to dismiss the existence of intra industry trade with any degree of confidence (Smith, 1994: 44).

The last two decades have witnessed enormous growth in the literature on international trade. This recent literature has shifted the focus away from the conventional or traditional models based on the assumptions of perfect

[7] This relates to the issue of intra- industry trade.

competition and constant returns in production to the implications of imperfect competition and economies of scale for international trade. The set of ideas contained in the recent literature of international trade has been termed the "new trade theory" and has been pioneered by Dixit and Norman (1980), Lancaster (1980), Krugman (1979b, 1980, 1981), Helpman (1981) and Ethier (1982). One of the main points of disagreements between new trade theories and conventional trade theory relates to the policy recommendations needed for industrial development. According to the new trade theory neutral incentives and *laissez faire* policies are not always conducive to industrial development as advocated by conventional trade theory.

The new trade theories have challenged three underlying assumptions of the conventional trade models. These includes:

- the assumption of perfect competition which is replaced by imperfect competition;
- constant returns (non increasing returns) to scale which is replaced by increasing returns to scale; and
- the definition of an industry in terms of homogeneous goods which is replaced by product differentiation.

However, it should be pointed out that these three assumptions are interrelated. Increasing returns to scale can explain the existence of specialisation and trade even in the absence of differences in technology (Ricardian model) or factor endowments (H-O model). Increasing returns to scale could mean that the domestic market may not be large enough to accommodate an industry's output and hence the world market (trade) provides the necessary demand for the industry's supply. In fact, the existence of increasing returns could be the motivation for specialisation or

even specialisation the motivation for increasing returns.[8] New trade theory has highlighted the existence of specialisation due to increasing returns by locating it in models of imperfect competition (Harris, 1992).

2.3.1 Imperfect competition

New trade theories are based on monopolistic and oligolopolistic competition models rather than perfect competition models as is the case in traditional trade theory. Under models of imperfect competition, firms are not simply price takers and do not face a horizontal demand curve. Part of the reason for firms not facing horizontal demand curves, is due to product differentiation. The Spence-Dixit-Stiglitz formulation of product differentiation (Spence, 1976; Dixit and Stiglitz, 1977) has formed the basis for models of monopolistic competition on trade. According to this model, each firm can costlessly differentiate its product from other firms, with each of these differentiated products entering symmetrically into the utility function of each consumer. This utility function is characterised by constant elasticity of substitution, and, if the number of products actually produced is sufficiently large, the demand for each product has a constant price elasticity. In this case, since product varieties enter utility functions symmetrically, the firm faces the same elasticity of demand no matter which product it produces, but as long as fewer products are being produced than the number that can potentially be produced, the firm would prefer to produce a new product rather than compete with firms producing existing products. Hence, the firm does not necessarily have to take the prevailaing market price as given, it can choose to produce another variety at some other price (which it can determine).

Also, with trade and monopolistic competition, the increased market size (because of trade) induces specialisation. A gain from trade in this case is

[8] The link between increasing returns and international specialisation was recognised early in the economic literature (Graham, 1923).

that with specialisation more varieties will be produced, and hence consumed, with a result that welfare (utility) is increased. The concept of specialisation is an illusive one. Very often specialisation of production in practice means specialisation in a particular product variety rather than in a particular product category.[9] Hence, production may be in a product category with more than one variety being produced. Hence, with competition the pattern of production can change with different varieties being produced.[10]

2.3.2 Economies of scale

In the real world, economies of scale are mainly internal to firms. However, perfect competition models can only accommodate pure technological external economies since internal economies of scale imply imperfect competition. Beginning with the work of Dixit and Stiglitz (1977), formal models of increasing-returns that did not require assuming purely external economies were developed.

Following Helpman and Krugman (1985), economies of scale can be classified in the following ways:

- static intra-firm technological economies of scale;
- static external economies; and
- dynamic economies of scale.

The implications of each for international trade will be considered.

(a) Static intra-firm technological economies of scale

[9] Product category in this case refers to the categorisation of a number of varieties into one category whereas a product would refer to a specific variety. For example, cars would be a product category wherease brand names like Toyota or Volkswagen would refer to specific products. However, depending on the level of categorisation, one could go even further to consider a particular model (e.g. Toyota Camry) as the specific product variety.

[10] This point will be explored in more detail under the section on economies of scale.

This can be divided into “traditional economies of scale” and “economies of specialisation” (Ocampo, 1993). The former involves a decrease in the average cost of production with increases in production without there being any increase in fixed costs (e.g plant or machinery). Economies of scale emphasize the degree of specialisation that characterises the production process. In this case, the degree of specialisation rather than a large plant, gives rise to increasing returns.

Like factor endowments and disparities in technological abilities, traditional economies of scale give rise to inter-industry trade which is the focus of conventional trade models (Ocampo, 1993: 124). However, the focus of attention of the new trade models has been on economies of specialisation and its influence on intra-industry trade (Dixit and Norman, 1980; Ethier, 1982; Krugman, 1990; Lancaster, 1980). The new trade theory suggests that the gains from intra-industry trade is due to economies of scale in the production of particular designs rather than to specialisation in a particular product category. One source of inefficiency in production under protective conditions is due to the abundance of different designs which are the results of short production runs (Pack, 1988). It may be the case that there is a need for local or domestic designs to be adapted to suit specifications and tastes abroad in order to increase export levels. Sometimes, the cost associated with these modifications influence the structure of export production (Keesing and Lall, 1992, Ocampo,1993: 125).

(b) External economies

In this case, scale economies are generated by input-output relationships manifested through either backward or forward linkages. Thus, a firm's access to inputs, its ability to take advantage of technological transfers and access to vital information may influence economies of scale in production.

Some of these scale economies may be of a macroeconomic nature or specific to certain industries. If the factors influencing economies of scale (e.g. access to inputs, technology and information) are specific to particular industries, then according to new trade theory, *"industrial complexes"* arise (Helpman and Krugman, 1989). This is also referred to as "clustering" (Richardson, 1969). These processes may encompass one or more industries, depending on the relative magnitude of the sectoral or macro economies. Due to the influence of external economies, differences in the initial level of development will tend to increase with development. This is referred to as *"uneven development"* in the new literature on trade (Krugman, 1990). If the economies are macroeconomic (sectoral) in nature this would be reflected in the development of the economy (sector).

The implications of uneven development for economic policy are that neutrality of incentives and *laissez-fairre* industrial policy may not be the most desirable. Some degree of selectivity may be necessary which may include protection and active state involvement in the promotion of investment in some sectors. This has more to do with "creating winners" through the implementation of selective policy rather than "picking winners" as has been the conventional interpretation of the East Asian Experience (Stewart and Ghani, 1992: 147).

(c) Dynamic economies of scale

These economies are associated with the accumulation of knowledge and "human capital". The process whereby these economies manifest themself is through "learning by doing" and a conscious effort to educate and gain knowledge (Ocampo, 1993). According to the new models of trade, dynamic economies of scale have an impact on international trade because knowledge is not perfectly mobile across countries. Products are associated with some given technology, and hence, it may be the case that with trade, technological transfers may occur. The extent to which dynamic economies

manifest themself depends on how much technology is transferred with trade in products, as well as the extent to which this technology can be further developed to suit local conditions. Dynamic economies of scale could thus provide a justification for infant industry protection, promotion of trade or even subsidies for the production of certain products.

One of the fundamental statements of new trade theory is that trade is increasingly a result of increasing returns in production rather than to comparative advantage. The pattern of specialisation and trade is due to a combination of history, accident and past government policies rather than solely to the underlying differences in national resources and aptitudes (Krugman, 1992: 245).

It should be pointed out that the suggestion that increasing returns (rather than comparative advantage) may be an explanation for international trade could be found in the writings of Adam Smith and Ohlin. However, new trade theorists introduced three new dimensions to the analysis of the concept of increasing returns, which helped to dispel some of the limitations that existed previously. These included:

- an analysis of economies of scale under conditions of imperfect competition;
- the acceptance of scale economies *and* factor proportions theory being plausible explanations for trade; and
- provision of a clearer analysis of the concept of external economies.

2.3.3 Product differentiation

Traditional trade theory with its convex production possibility frontier was the result of differences in factor intensities. However, with increasing returns, the convexity of the production possibility frontier is called into question and depending on the magnitude of economy of scales, even a concavity of the frontier is possible. While it is doubtful that scale economies are strong

enough to result in a concave production possibility frontier, but as Krugman (1992) notes, as long as one operates within a two sector by two factor model, comparative advantage (rather than increasing returns) will be the most plausible explanation of trade.

The new trade models do not restrict the choice between comparative advantage *or* increasing returns as the underlying causes for trade. Early models of intra-industry trade assumed that products could be grouped into "industries" where, at the aggregate level, factor proportions or comparative advantage explanations were responsible for "inter-industry" trade while "intra-industry" trade, which was due to specialisation within industries, was primarily driven by economies of scale in production. In this way, new trade theory offered a kind of synergy between comparative advantage and increasing returns.

2.3.4 New trade theory: Some implications for the role of government

New trade theory has elegantly proven that government intervention can secure efficient industrialisation. Some of the reasons for this will be explored below.

(a) Rent extracting and rent shifting

In their model, Brander and Spence (1984) consider a sole foreign owned monopolist operating in a market without any domestic competition. In this case, a tariff could be partly absorbed by the monopolist rather than passed onto domestic consumers. As long as the foreign seller is charging a price above marginal cost, and as long as s/he is able to discriminate between the domestic market and other markets, it will be possible for a tariff to lower prices. This would suggest a terms-of-trade justification for tariffs similar to the traditional optimum tariff argument with the difference being that the tariff imposing country need not be large relative to world markets (Krugman, 1994: 254). Rent shifting also reinforces rent extraction (Brander and

Spence, 1984). In other words, in the absence of domestic competitors, a tariff would be partly absorbed by foreign firms. The presence of domestic competitors will reinforce the case for a tariff.

(b) Reducing marginal cost

Protection of the domestic market can serve as a form of export promotion (Krugman, 1984). In this model, two competing firms with downward sloping marginal cost (rather than constant marginal cost) curves are considered. With protection, the domestic firm is able to increase it's sales, and thus reduce its marginal cost relative to it's foreign competitor's marginal cost. This could also lead to increased domestic firm's sales in unprotected third markets - that is, increased exports.

(c) Protection promotes additional entry and may lead to price decreases.

Venables (1991) considers a model with constant marginal cost curves and free entry and exit of firms into the industry. This would raise the profitability of domestic producers *vis-a-vis* foreign producers. Depending on the competitive pressures of the domestic markets, additional producers could enter the market which could reduce the price of the good (if a large number of new domestic producers enter into the production of the good).

(d) New trade theory – does it justify protection?

While new trade theory has proved that free trade may not lead to optimal resource allocation, the policy recommendations surrounding the issue of protection has been mixed. Some (Venables and Smith, 1986; Harris and Cox, 1984) have used new trade theory as a basis for the justification for free trade areas in Europe and North America.

Krugman (1992) advocates "very low tariff or subsidy rates" (10-20 percent) for strategic industries or industries subject to economies of scale.[11] Krugman (1992: 435) and others (Baldwin and Krugman, 1988; Cox and Harris, 1985; Dixit, 1988; Smith and Venables, 1988; Venables, 1991) have argued that while strategic trade policy appears to promote exports, the welfare conclusions are not very radical. One of the main concerns against strategic trade policy relates to the problems of identifying strategic sectors or industries. In Krugman's (1992: 434) words: "…*a strategic policy for one (industry) is an anti-strategic policy for others, and only a very smart government could be sure of raising the average".* This is so since "strategic industries" by their very definition require large outlays of capital and technology – resources that are scarce in developing countries.

The justification for protection on the basis of external economies is more forceful. *"What new (trade) theory tells us is that meaningful externalities occur not only when there are direct technological spillovers, but in any situation in which there are increasing returns and market size matters. That means almost everywhere…Now of course we do not know very well which are the good activities and which are the bad, nor do we have a good idea at*

[11] The suggested rate is for a developed economy which raises the question of what the rate should be for less developed economies given the infrastructural and other constraints that are likely to confront the industrialist in a developing country. The level and scope of support that should be accorded to industries depends on the degree to which dynamic comparative advantage can be realised - note the emphasis on dynamic comparative advantage rather than the neoclassical notion of static comparative advantage. The economic environment may be such that there is a need for strong support (high level of protection) for the realisation of scale economies. The degree of support has to be at such a level so as to promote/encourage the production of the good in question. However, the question remains whether import protection (tariff) or some other form of support (training subsidy, R&D funding etc) should be given to the industry. The answer to this question is simply that the form and scale of support should provide the necessary incentive for domestic producers to increase production of the good(s) in question. Very often restricting the domestic market for domestic producers is more effective since training subsidies and R&D expenditures take some time before the benefits can be realised. This is not to suggest that tariff protection is always superior to other forms of intervention and should be favoured over other forms of support. It is very likely that there may be a need for tariff protection and other forms of intervention (training subsidies, R&D expenditures) to complement each other. In many instances the impetus that is needed to spur domestic production is a guarantee of a market for the output produced - this is particularly the case if the domestic market is large.

all of how large external economies really are. We often imagine that this uncertainty is an argument against any action. But it is not clear why, at least on pure economic grounds. If I am not sure whether a dollar's worth of resources in an industry yields $1.10 or $2.00 of benefits, it does not improve matters to throw up my hands and offer the industry no subsidy at all. If a benevolent dictator were setting economic policy, she would make her best guess and establish a set of taxes and subsidies based on that guess; my guess is that her guess would typically involve subsidies at the rate of 20 percent or so for favoured sectors. And she would, of course, institute a major and lavishly funded program of economic research in order to improve that industrial policy." (Krugman, 1992: 434-435).

The view that there are difficulties in implementing effective trade (protection) policies is mainly due to the belief that protection (tariffs) reduces domestic demand and output and hence the negative effect on economies of scale in production. However, if tariffs were to increase domestic demand, then the introduction of new products will be stimulated and the gains from protection will be much larger than new trade theorists suggest (Kitson and Michie, 1995: 637). Kitson and Michie (1995) argue that where protection is viewed as a demand management tool under conditions of unemployment and slow growth rather than, as an industrial policy tool under conditions of full employment, then it is not necessary to identify strategic sectors but rather competitive imports *vis-a-vis* complementary imports.[12] In addition, if domestic demand were to increase with protection, employment, income and economic growth will be positively influenced.

[12] The intention being to reduce competitive imports and not to intentionally reduce the actual volume of imports. Devaluation is not recommended since it raises the price of all imports not just competitive imports. For an analysis of British post-war economic policies see Kaldor (1971).

2.3.5 New Trade theory: some policy implications

One of the central tenets of the new trade theory is that the assertion that free trade is an optimum policy is not so straightforward. On the one hand, the existence of imperfect competition may call for increased competition (trade) to force a decrease in profit margins.[13] On the other hand, the potential of realising economies of scale in production may justify government intervention. The argument here is that without deliberate government intervention, there would be under-investment in production activities subject to high degrees of external economies relative to production activities with fewer external economies.

Brander and Spence (1985) produced a model in which they show that strategic intervention by governments through, for example, the granting of export subsidies, results in the profitable use of excess capacity to increase output produced, and hence, increase the domestic producer's share of the international market. In this way, local firms (production) are favoured (promoted) *vis-a-vis* foreign competition. However, the Brander and Spence (1995) model was based on Cournot competition, where each firm sets its output, taking it's competitor's output as given. Relaxing this assumption leads to different results. If firms, for example, compete in prices rather than output, then the optimal policy is an export tax (Eaton and Grossman, 1986). However, of crucial importance is whether there exists enough excess capacity in production to justify strategic trade policy intervention (Horstmann and Markusen, 1986). There is also the possibility that strategic trade policy could result in retaliatory action by foreign governments, which if it spirals out of control, could result in trade wars. In this case, there is a prisoners' dilemma where two countries protecting the same sector subject to external economies, could fragment the market and possibly result in both being worse off (Krugman, 1990). In the real world, industries have to compete for scarce resources, and hence, a strategic policy for one industry could mean

[13] See Venables and Smith (1986) and Harris and Cox (1984).

less governmental resources or support for another (Dixit and Grossman, 1986). However, a country may have a dynamic comparative advantage in an industry (because of dynamic externalities) but be uncompetitive according to static comparative advantage calculations. In this case, intervention (e.g. through granting of a subsidy, imposition of a tariff, etc.) may be justified.

The new trade theories do not advocate across-the-board protectionism nor neutral incentives and *laissez-faire* industrial policy. Instead, the new theories corroborate the wisdom of maintaining some selectivity in terms of sectors and markets and state support for certain activities that are subject to significant economies of scale (Stewart and Ghani, 1992).[14]

According to new trade theory, comparative advantage is not solely dependent on factor endowments. The policy implication is that a country can, through selective interventions, influence the pattern of comparative advantage. New trade theory recognises that history, random events (wars, oil crisis, sanctions, etc) and past government policies are important factors shaping a country's trade pattern. A variety of factors (other than comparative advantage) could influence a country's industrial capability. The formulation (and implementation) of industrial policy has to take cognisance of these factors.

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[14] Once a case for government intervention becomes obvious, it then becomes necessary to determine the intensity of government support that would be accorded to the industry. *Mild* support may involve the granting of a 5 percent subsidy or tariff equivalent level of protection (Stewart and Ghani, 1992: 144). Higher level of protection would depict *strong* intervention. As mentioned earlier, the level of protection depends on the degree and extent to which dynamic comparative advantage is expected to be realised, for example, the economic environment may be such that there is a need for strong intervention (i.e. high level of protection) for the realisation of economies of scale. Strong intervention could be justified on the grounds of either expediting the realisation of economies of scale or the importance of the industry in terms of its linkage to other industries or potential for securing increased employment, export earnings, etc.

According to traditional trade theory, liberalisation (free trade) secures an efficient allocation of resources. However with imperfect competition, gains from liberalisation would only result if the liberalisation measures impart growth impulses to industries that are subject to economies of scale and a reduction in the profit margins of these industries. However, if liberalisation leads to the contraction of the industries subject to economies of scale, then the economic benefits would be reduced. Also, even if liberalisation places pressure on imperfect competitive forces in the economy, there is no guarantee that the economy is better off. In a situation of monopolistic competition for example, the reduction of profit margins (through liberalisation) may force the closure of firms whose production designs are geared for a particular segment of the domestic market (e.g. low income consumers). In this case, the liberalisation measures could have large distributive effects (especially if the industry employed a large number of workers as well).

2.4 Conclusion

If production according to a country's comparative advantage situation is needed to secure international competitiveness, then trade policy should facilitate such production. The fundamental policy issue is then the role of government in this process. It is widely accepted that the fundamental role of government is to "create an enabling environment". The appropriate role of trade policy in the industrialisation process has been the subject of much debate in the economic literature. Much of this debate has centred on the causes of international trade and its implications for trade policy. In this chapter, theories that advocate free trade as a basis for securing comparative advantage are surveyed. However, it was also shown that economies of scale, externalities and imperfect competition do not rule out the possibility of using interventionist strategies as a means of promoting comparative advantage. This in effect means that free trade may not necessarily be the optimum policy choice. Given this status quo, what is the

role of Government in influencing the structure and extent of industrial production? A critical appraisal of the implications of protection for production according to a country's comparative advantage situation, and hence, competitiveness, provides a convenient analytical context to appraise government's role in international trade. This is the focus of the next chapter.

CHAPTER THREE

PROTECTION AND ITS IMPLICATION FOR COMPETITIVENESS

3.1 Introduction

It is widely accepted that industrial development should be one of the core objectives of government policy. Industrial development is seen as a vital pillar of economic growth. It is necessary for, inter alia, the creation of employment, meeting the basic needs of the population and diversification of the economy. One of the fundamental objectives of industrial policy is to ensure efficiency in production. Export-oriented strategies (rather than import substituting strategies) have been advocated as the best means of achieving rapid, efficient and sustainable industrial development (Bhagwati, 1990; Little, Scitovsky and Scott, 1970; World Bank, 1987). Export production, it is argued, facilitates an efficient allocation of resources. The discipline of the (world) market promotes constant productivity improvements, which in turn, is taken to be one of the main pillars of economic growth (Bhagwati, 1990).[1] Stated very simply, the policy implication is that domestic producers should be subjected to international competition since reduced protection increases competitiveness, which in turn facilitates efficient industrialisation.

However, four points can be made about the argument in the preceding paragraph. Firstly, the conventional divide between the export orientated trade strategy and import substituting trade strategy has been called into question. Liang (1992) has shown that in a three-sector model, five mutually exclusive trade strategies can be identified.[2] Secondly, while there is little dispute that export production can make a meaningful contribution to foreign exchange earnings, employment creation and efficiency in the allocation of resources, the causal relationship between exports and economic growth has not been emphatically established. Thirdly, the East Asian experience has shown that

[1] This discipline works itself through the price mechanism since international prices are assumed to reflect a situation where marginal costs equal marginal revenue. This is based on the notion of perfect competition, and as such, monopoly and oligopoly situations are rules out.

[2] This is explored in more detail in chapter five.

the path to export production may indeed be via the route of import substitution which in turn may mean that protection may not only be desirable but also necessary for export production. Fourthly, industrialisation is today considered to be a multi-dimensional phenomenon. It is taken to imply more than just an increase in physical capacity or output. It involves the efficient utilisation of the increased capacity, the growth being characterised by increases in productivity and an increasing quantity of domestic resources (both human and non-human) being used in the production of the output (Lall: 1990: 121). In addition, modern management theorists stress the social, cultural and political aspects of intra-firm strategic resource allocation as an important element in successful industrialisation. As far as the organisation of production is concerned, for example, industrialisation should entail greater worker participation in the design, execution of work and share in the gains of a job well done (Bowles and Gintis, 1990: 174).

Chapter two has already highlighted that the relationship between reduced protection and improved competitiveness may not be as straightforward as is sometimes advocated in the economic literature. What is the implication of this for government policy? This question informs the analysis in this chapter. A critical analysis of some theoretical aspects and empirical evidence of trade policy is considered in sections 3.2 and 3.3 respectively. Section 3.4 considers the empirical relationship between tariff protection and economic growth. The penultimate section reviews the concept of competitiveness while the last section concludes.

3.2 Trade incentives and industrialisation: Some theoretical considerations

For the neoclassical economist, the competitive position of a product on the international market provides *the* indicator of whether production is efficient or not. In summary, the competitive position of a product is determined by the price of that product relative to its competitors or substitutes on the international

market.[3] Thus, for orthodox economics, one of the primary objectives of industrial policy is “getting prices right” with world prices being the “right prices”. Allocative efficiency is thus achieved by getting domestic prices to equal world prices - which in turn is best achieved through free trade.[4] International prices reflect the international marginal rate of transformation in a competitive international economy and as such provide the benchmark for efficiency in the allocation of resources (Berg and Krueger, 2003). In addition, it is expected that free trade will lead to the specialisation in goods in which the country has a comparative advantage.[5] The "infant industry" argument has been presented as one of the main - and some would probably argue, the only - justifiable reason for protection.[6] However, traditional models based on the assumptions of perfect competition and full employment in essence means that industries that should be protected during their infant stages should in essence be Heckscher-Ohlin type industries. Thus, trade is driven by the principles of comparative advantage. However, as was shown in chapter two, new trade theory incorporating assumptions of external economies of scale and imperfect competition have questioned the assumption that international trade is driven solely by comparative advantage.

Is free trade the panacea for trade policy problems and challenges? Three pertinent points, *inter alia,* can be made in this regard. Firstly, "free trade" is an illusive concept usually taken to mean "freer trade" defined from a developed country perspective. With the reduction in tariffs in developed countries there

[3] Such an approach does not give due recognition to other important determinants of competitiveness, for example, quality of product, brand names, marketing techniques, tastes, etc.

[4] For the neoclassicist, free trade also results in an improvement in welfare. This is so since trade makes available consumption possibilities that are outside the production possibility frontier. There are only two justfiable reasons for intervention in international trade, namely, the optimum tariff argument and the infant industry argument. Most standard texts on international economics would include an explanation of these two aspects.

[5] This is captured in the famous Heckscher-Ohlin theorem.

[6] The essence of the argument is that short-term production welfare losses will be offset by long-term gains. One of the early proponents of the infant industry argument was List (1856). However, Baldwin (2003) mentions that Alexander Hamilton made reference to the concept as early as in 1791. Prebisch (1950) argued that the decline in the prices of primary products (of the developing countries) relative to the prices of manufactured goods (of the developed countries) and the low elasticity of demand for primary products warranted the use of infant industry production to expand manufacturing production in developing countries.

has been a proliferation of non-tariff barriers.[7] Secondly, the justification for free trade is based on the assumption of a perfectly competitive market structure. Perfect competition is for all intents and purposes a theoretical ideal, which very rarely exists in practice.[8] This leads to the third point, namely, that new trade theory has shown that, under conditions of imperfect competition, government intervention is not only justifiable, but may also be necessary for successful export production.[9] On the issue of government intervention, two pertinent points can be made. Firstly, there is no firm evidence that proves that less government leads to faster economic growth (Rapley: 1994: 501). Secondly, more government does not necessarily mean less market. Government interventions could be market enhancing rather than market repressing.[10] Thus, it is not so much the size of the state but the quality and nature of the intervention by the state that is important. [11]

Two conventional arguments that have been advanced in favour of trade liberalisation relate to the reduction in *"static"* inefficiencies and an increase in "*dynamic"* efficiency. The former is based on the Ricardian view that trade is beneficial (i.e. welfare enhancing) even within a comparative advantage context. In the case of static efficiency gains, the distinction is between "technical" and "allocative" efficiency. The former refers to the case where maximum output is produced from the available inputs, while the latter concerns the optimal allocation of resources. *"Dynamic"* efficiency gains, on the other hand, refer to an increase in the growth potential, usually achieved through improvements in technology, productivity gains and economies of scale in production. In this case, there is an increase in production with a given quantity of inputs. The impact of protection on *"dynamic"* and *"static"* efficiency

[7] It is mainly the developed countries that have been leading the call for free trade. Two issues are important here; one relates to the increase in the use of non-trade barriers (mainly involving environmental legislation, labelling restrictions, health considerations) and secondly, many of the countries that are leading the call for free trade have themselves used high levels of protection to reach their present stage of development.

[8] The assumption of perfect competition is usually made for statistical and analytical convenience. However, new trade theory provides a rich set of models, which circumvent some of the measurement problems associated with earlier trade models.

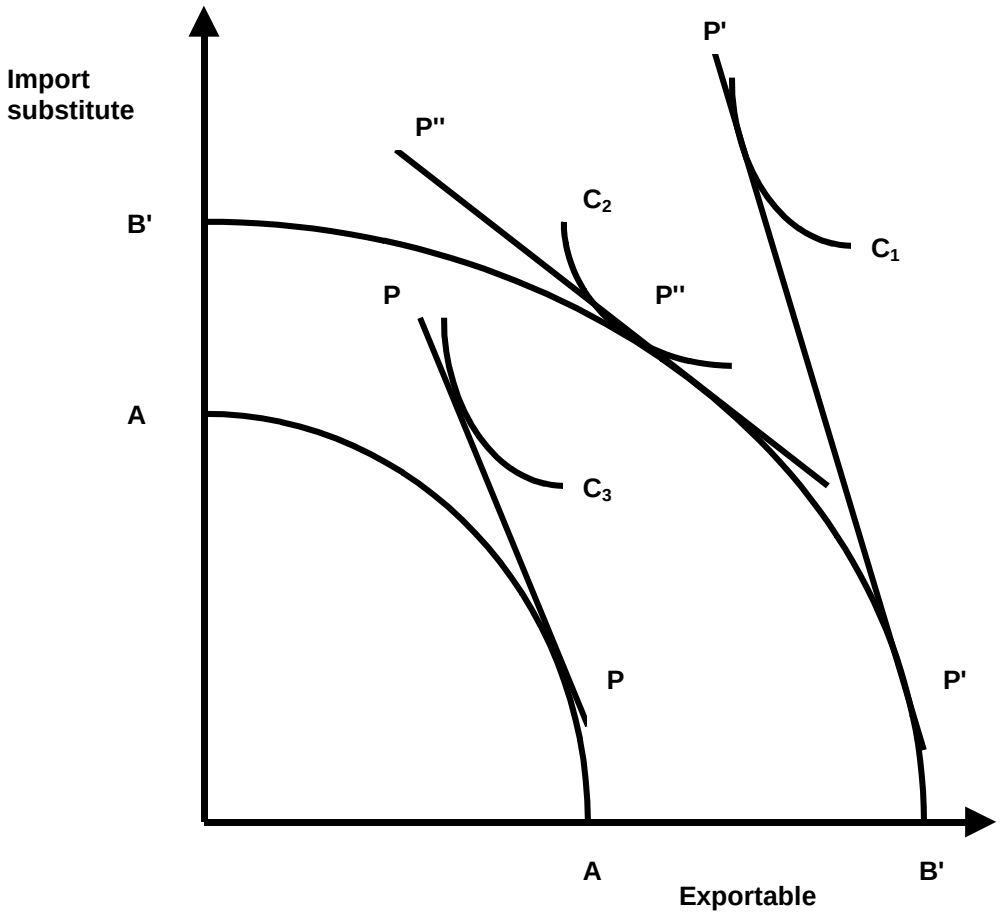
[9] This was discussed in the previous chapter.

[10] Many economists advocate such policies in practice (see Lall, 1990: 60; Killick, 1993; Garnaut, 1991).

can be conveniently represented with the aid of the conventional production possibility frontier and indifference curves as indicated in figure 1.

B'B' represents the production possibility curve depicting potential output (i.e. the maximum quantitities of exportable and import-substitutes) that can be produced under conditions of free trade. Under conditions of free trade (perfect competition) *"static"* and *"dynamic"* efficiencies are optimised; production is specialised in exportables (the good in which the country has a comparative advantage) at say P', and welfare is maximised with consumption on indifference curve C_1. In addition, the relative price is given by P'P'.[12]

Figure 1: Impact of protection on production and resource allocation



[11] Even the World Bank has moved away from its earlier radical free market approach. See World Bank (1991) in which an increased role for the state is advocated.

With protection (say tariffs) on import-substitutes, the relative price of import substitute (depicted by P''P'') increases attracting resources from the production of exportables into import-substitutes. This leads to a reduction in the production of exportables, the good in which a country has a comparative advantage. The net result is that welfare decreases since consumption is on a lower indifference curve C_2.[13] It is important to realise that under these conditions, that while production is still efficient (still on the production frontier), it is not optimal since production is not specialised in the production of goods (exportable goods) in which the country has a comparative advantage. Hence, any price (such as P''P'') that makes the relative price of import-substitutes greater than exportables will not result in "optimal" production.

However, the common effect of protection is to reduce potential output because of rent-seeking behaviour or trade incentives inducing x-inefficiency (Sharma, 2000: 7). This causes the production possibility frontier to move inwards to AA. In this case, welfare is further reduced (consumption is now on C_3) even if the country engages in some trade. With the inward movement of the production possibility frontier, production is neither efficient nor optimal.

The basic point that emerges from the analysis is that under conditions of perfect competition, free trade promotes *"static"* and *"dynamic"* efficiency. Firstly, considering the issue of *"static"* efficiency, it is argued that protection creates a bias against export production in favour of import-substituting production (Krueger, 1978; Bhagwati, 1988a, 1988b). However, this view is based on a two-sector framework (importables and exportables) and does not necessarily hold in a three-sector framework; import-substitution and export-promotion need not be viewed as alternatives but as complementary strategies (Liang, 1992).[14] Under conditions of imperfect competition, trade liberalisation may result in an excessive volume of imports, which does not promote an

[12] The shape of the production possibility frontier indicates that the country has a comparative advantage in exportables.
[13] In the example, it is assumed that protection leads to autarky. However, even if protection did not prevent trade completely then consumption will still be on a lower indifference curve.
[14] This aspect will be considered in more detail in chapter five.

efficient allocation of resources (Levy and Nolan, 1992: 56). In addition, increases in export production may be more difficult to accomplish in practice given the low elasticities of supply in developing countries (Mosley, 1993), which are primarily due to skills shortages and technological and institutional constraints (Lall, 1991).

Within the neoclassical framework, protection is said to adversely influence *"dynamic"* efficiency through its impact on productivity improvements. Protection reduces external competition and restricted access to imported technology (Srinivasan and Bhagwati, 1999). However, there are strong theoretical (Rodik, 1992a, 1992b) and empirical evidence (Tybout et al, 1991; Young, 1995; Deraniyagala and Fine, 2001) that contests the strong positive relationship between reduced protection and productivity improvements.[15] In addition, the impact of liberalisation on import penetration is ambiguous. On the one hand, liberalisation could result in increased imports. On the other hand, increased competition and access to imported technology could improve the competitiveness of domestic industry with the result that import penetration may decrease (Sharma, 2000).[16]

On the basis of the brief review presented thus far, it is not unreasonable to assume that *"…the importance of openness for growth is therefore an empirical question"* (Berg and Krueger, 2003: 7). The next section is devoted to a review of the empirical evidence relating to trade liberalisation and growth.

3.3 Trade policy and economic growth: The empirical evidence

One of the issues that has dominated the international economics literature has centred on the relationship between trade policy and economic growth. More specifically, empirical analysis has focussed on identifying a link between trade policies and long-run performance – measured in either per capita or productivity growth. Over time, the availability of better data and more sophisticated econometric techniques has resulted in numerous studies

[15] See Hobday (1995) for a good summary of the empirical literature.
[16] The decrease in import-penetration will not occur instantaneously but over time.

analysing the impact of government policy on economic growth.[17] However, based on the evidence to date, it is fair to say that there is still much disagreement on the empirical relationship between trade policies and economic growth (Baldwin: 2003: 1). Given the voluminous literature on the subject, this section provides a very selective review with the emphasis being on developments during the 1990s.

The early 1900s was characterised by the extensive use of protectionist polices (especially tariffs) to foster inward-oriented industrialisation. Germany, France, United States and Japan made extensive use of protectionist policies to foster their industrialisation process (O'Rouke, 2000; Clemens and Williamson, 2001). The success of the Soviet Union in the 1920s and 1930s, and China after 1949, gave credence to the use of protectionist policies as the basis for industrial policy. The experience of these countries served to inspire similar policy in countries that gained independence from their colonial powers after World War II (Baldwin, 2003: 4). It was these developments that gave prominence to the infant industry argument.[18] According to Baldwin (2003: 4), the extension of the infant industry argument to the entire manufacturing sector adversely influenced macroeconomic variables such as exchange rates, aggregate exports and imports and fiscal and monetary policy. By the late 1960s, a policy shift towards export-oriented industrialisation began to gain popularity.

A critical appraisal of import-substituting industrialisation began to emerge. Firstly, Little et al (1970) and Balassa (1971) used effective rate of protection measures to show that protection had highly distortionary effects on manufacturing value added in developing countries. The empirical work then increasingly shifted towards testing the relationship between trade and growth. The policy prescription emanating from influential studies of the time advocated outward-oriented industrialisation (Krueger, 1978; Bhagwati, 1978), which in essence entailed trade liberalisation (Balassa, 1971).

[17] Government policy has been proxied by the openness or bias of the trade regime.

Developments in endogenous growth theory during the 1980's (Romer, 1990; Lucas, 1988; Grossman and Helpman, 1991) and availability of better data and developments in statistical techniques gave renewed impetus to the investigation of the relationship between trade policy and growth during the 1990s. As pointed out in chapter two, while new trade theory questions the optimality of free trade policy under certain conditions, it does not necessarily justify protection. In fact, the new growth literature establishes cases where openness is positively correlated with long-run growth.[19]

In the remainder of this section a brief review of some of the influential trade policy analysis undertaken during the 1990s, is provided. Much of the empirical work during this period focussed on the relationship between exports and growth rather than on trade policy and growth. In a review of the literature Edwards (1993: 1389) asserts that:

> *"The theoretical frameworks used have been increasingly simplistic, failing to address important questions such as the exact mechanism through which export expansion affects GDP growth, and ignoring potential determinants of growth such as educational attainment…All of this has resulted, in many cases, in unconvincing results whose fragility has been exposed in subsequent work."*

However, despite these reservations multilateral institutions have been vociferous in arguing that:

> *"…more open and outward-oriented economies outperform countries with restrictive trade and investment regimes"* (OECD, 1998: 36).

This view has been premised on the belief that:

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[18] Baldwin (2003) argues that the foreign exchange shortage emanating from increased pressures to import capital goods (and also consumer goods) for reconstruction purposes after the war in some respects forced countries into adopting import-substituting policies.

[19] Edwards (1998) argues that technological change is a positive function of a country's openness and the technology gap *vis-a-vis* the rest of the world. Coe and Helpman (1995) argue that the recent models of economic growth imply a positive relationship between openness and total factor productivity growth. Their argument is that openness to trade allows for both the importation of new imports and quicker domestic production of these inputs, which in turn, positively impact on total productivity growth.

> *"Policies toward foreign trade are among the more important factors promoting economic growth and convergence in developing countries"* (IMF: 1997: 84).

One of the recent studies to emphatically question the alleged positive relationship beween openness and economic growth is Levine and Renelt (1992). They use different measures of trade policies, yet find no positive relationship between openness to trade and economic growth in the long-run. However, their work does find a positive correlation between investment and trade shares, thus leading them to the conclusion that the benefits of trade reform may be enhanced resource accumulation rather than a more efficient allocation of resources.

Dollar (1992) analyses the relationship between outward orientation and economic growth for 95 countries. His argument is that outward orientation is conducive to economic growth. Much of the criticism of the empirical work on trade policy has centred on the narrow definition of the trade restriction measure. Ben-David (1993) has found that trade liberalisation promotes convergence among integrating countries.[20] Economic integration led by trade relations promotes convergence among countries. Sachs and Warner (1995) construct an openness measure for 79 countries by considering five factors; namely, tariff barriers, non-tariff barriers, the economic system of the country, whether there is state monopoly control over exports and the parallel market premium on the exchange rate.[21] The Sachs and Warner (1995) study find a positive relationship between the growth rate of per capita GDP and the openness measure. Edwards (1998) considers nine measures of openness and finds that six of these measures are significant determinants of total factor productivity growth. However, all of these studies have been meticulously criticised by Rodriguez and Rodik (1999, 2001). They prove that these studies have methodological, conceptual and statistical deficiencies, which lead to doubts about their main result, namely, the existence of a strong positive

[20] For Ben-David (1993, 1996) trade liberalisation is the main factor promoting convergence among integrating countries.

relationship between trade openness and growth.[22] More specifically they assert that;

> *"Our bottom line is that the nature of the relationship between trade policy and economic growth remains very much an open question. The issue is far from having been settled on empirical grounds. We are in fact sceptical that there is a general, unambiguous relationship between trade openness and growth waiting to be discovered. We suspect that the relationship is a contingent one, dependent on a host of country and external characteristics"* (Rodriguez and Rodik, 1999: 4).

In addition, Slaughter (1997) has shown that convergence in income can occur because of a convergence of capital-labour ratios rather than factor prices.[23] In addition, there is no firm evidence to show that trade liberalisation leads to faster convergence among countries that liberalised trade as compared to those that did not liberalise their trade (Slaughter, 2001).

Frankel and Romer (1999) attempt to avoid the controversy in choosing an appropriate openness measure by considering geographic factors and the use of instrumental variable techniques to analyse the relationship between trade and income. Their results confirm some of the earlier results, namely, that trade does influence income growth. However, Rodriquez and Rodrik (1999) have argued that the geographical measures used by Frankel and Dollar as instrumental variables may not be valid (cited by Baldwin, 2003: 25).

The basic point to emerge from the empirical analyses undertaken during the 1990s is that the debate on whether trade openness promotes growth is far from settled. Given the interplay between trade policy and other

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[21] The openness measure is a dummy variable and assumes a value of zero (closed economy) if any of the five factors fall below the benchmark criteria.

[22] Harrison and Hanson (1999) also review the work of Sachs and Warner (1995). They show that the Sachs and Warner index (which attempts to capture the influence of trade, exchange rate and institutional aspects) is significantly flawed as a measure of openness. As a result of this flaw, they argue that the Sachs and Warner index does not establish a robust link between more open trade policies and long run growth.

[23] On the issue of the convergence of product prices between trading countries, Knetter and Slaughter (1999) find little evidence of convergence toward common prices between Europe, US and UK. For Developing countries the evidence is mixed.

macroeconomic policies (e.g. monetary and fiscal policy), it is probably fair to argue that it is extremely difficult to construct models that give rise to robust relationships. It is therefore not surprising that the *"…links between the empirical and theoretical work have never been too strong"* (Rodrik, 1995: 1480). Probably, the problem has been that policy appraisal has relied too heavily on empirically testing the complex macroeconomic relationships between trade policy and economic growth.

The literature to date has emphasized that while there is a theoretical justification for a strong (or even a robust) relationship between open trade policy and economic growth, the empirical verifications have been unconvincing. In addition, since measures of economic growth (e.g. per capita GNP) usually (especially in developing countries) do not accurately reflect distributional and consumption effects, even if restrictive trade policies reduced economic growth, it does not follow that they necessarily reduce the level of welfare (Rodriguez and Rodrik, 1999: 4).

While a robust empirical relationship between open trade policy and economic growth has not been established, it is important to note that the converse is also true; namely, that there is no strong evidence to suggest that protection leads to economic growth.[24] Under conditions of perfect competition, efficient resource allocation requires a "levelling of the playing field" - however, economic reality (imperfect competition, economies of scale, etc) may mean that liberalisation has beneficial results only if it is done in a discriminating manner (Stewart, 1991, Lall, 1990). Subjecting producers to international competition can promote competitiveness, but it can also lead to the destruction of potentially competitive industries (Wade, 1990: 15-22; Adhikari et al, 1992: 7-8). In effect, this means that the impact of trade liberalisation is an empirical issue.

[24] Although, Chang (2002) notes that developed countries have all used protection to industrialise.

3.4 Tariffs and economic growth: A brief review of the empirical evidence

Recently, there has much empirical work explicitly exploring the link between tariffs and economic growth (Irwin,1998, 2000a, 2000b, 2001, 2003; Clemens and Williamson, 2001, 2002; Williamson, 2003; O'Rouke, 2000). This work follows on earlier work (Bairoch, 1972; Capie 1983; Eckes, 1995) which all found that tariffs were associated with higher growth rates before world war one - the so called tariff-growth paradox.[25] The same result was found for the period between the first and second world wars (Vamvakidis, 1997 cited in Clemens and Williamson, 2001).

Clemens and Williamson (2001) use a larger sample of countries and confirm the tariff-growth paradox for the period preceding 1950 but find that tariffs were associated with slow growth after 1950. In an attempt to explain the reversal of the tariff-growth correlation after 1950, Clemens and Williamson (2002) find that after accounting for the significant reduction in tariff barriers in all countries since World War II, there is no incompatibility between the results pre-1950 and post 1950. They argue that high tariffs need not necessarily impede growth and the benefits of openness are neither inherent nor irreversible but rather depend upon the state of the world (Clemens and Williamson, 2002: 25).

Irwin (2001) has analysed the tariff-growth correlation of Argentina and Canada during the 19th century and argues that it was factor endowments (abundant land) coupled with sound institutions and policies that fostered growth - the tariff was used as a means of raising government revenues to fund institutional and infrastructural development conducive to economic growth. Chang (2002) argues that both Britain and the United States have relied extensively on protective tariffs to stimulate industrial development and having reached their objective, these countries are eager to kick away the "ladder" (protective tariffs) that helped them to industrialise in the first place. Irwin (2001), while conceding that there is a high correlation between tariffs and growth in late 19th century America, contests the hypothesis that high tariffs led to economic growth - non tradable sectors (namely utilities and services) were the main drivers of

[25] This paradox was also confirmed by O'Rouke (2000).

economic growth during this period. However, as mentioned earlier on, Rodriguez and Rodrik (1999, 2001) have shown that, when a variety of economic variables are taken into account, the results may be sensitive to the methodology and statistical measures used in empirical analysis.

Probably, the most important lesson to be learnt from the empirical analysis to date is that there is no robust relationship between tariffs and economic growth. If this is the case, then economists should strive, not only to identify the fundamentals driving tariff policy (Williamson, 2003: 38), but also to ascertain if these fundamentals (e.g. improved competitiveness) have been met. In the case of South Africa, tariff liberalisation during the 1990s was geared towards improving competitiveness. Thus the issue of importance is whether this did in fact materialise.

3.5 The concept of competitiveness

The term competitiveness is usually used in a comparative context to refer to an advantage over competitors in the domestic or international market.[26] Krugman (1994; 1996a; 1996b) argues for a distinction between the macro and micro dimension of competitiveness - competitiveness among nations is not a zero sum game, and hence, competiveness amongst firms cannot be likened to competitiveness amongst nations. Krugman (1994) and Helleiner (1989) have cautioned against the concept of economy-wide competitiveness arguing that a country cannot be competitive in all activities. In essence, the point to bear in mind is that if an economy-wide measure shows that there is an improvement (deterioration) in competitiveness, what does this mean in practice? Have all industries become more competitive (uncompetitive)? Hence, for policy purposes, it is imperative to analyse the impact at the sectoral or industry level.

The empirical literature to date has focused on both price and cost comparisons as indicators of competitiveness. Traditionally, real effective

[26] The World Economic Forum (WEF) defines competitiveness as a country's ability to achieve sustained high rates of growth in GDP per capita while the International Institute of Management Development (IMD) emphasizes a country's ability to provide an economic environment that sustains an industry's competitiveness.

exchange rate (REER) and unit labour costs (ULC) have been used to analyse competitiveness across countries. The analysis of South Africa's competitiveness on the basis of REER movements has also been undertaken recently (IMF, 1998; Kahn, 1998; Walters and De Beer, 1999; Tsikata, 1999, Golub, 2000). However, since the REER is an aggregate trade weighted index, its relevance for the analysis of competitiveness at the sectoral level is limited.[27]

Relative unit labour costs, on the other hand, are assumed to reflect international differences in labour costs and labour productivity (Turner and Golub, 1997; Turner and van't Dack, 1993). Analysis based on ULC measures make the implicit assumption that labour costs are the most important determinant of trade. Turner and Golub (1997), in a survey of the literature conclude that relative unit labour costs represent the best indicator of competitiveness. However, within the South African context, there are three major limitations associated with ULC comparisons. Firstly, reliable data on labour productivity and wages may not be available on a timeous basis. Secondly, there is an implicit assumption that labour is the only factor of production and any discrepancies across countries are due to labour costs.[28] Other costs of production (e.g. those related to intermediate goods and capital costs) are ignored. It is also possible that unit labour cost differences may be due to technological differences. In the standard unit labour cost analyses there is an implicit assumption that underlying structural factors are constant (Lall, 2001a; 2001b). Thirdly, ULC comparisons are strongly dependent on the assumption of perfect competition. By using unit labour cost as a proxy for competitiveness, it is assumed that profit margins vary in the same ratio as relative unit labour costs. This should be subjected to empirical verification rather than assumed.

Viewing competitiveness purely in terms of changes in exchange rates or wages does not give due recognition to the importance of other factors such as

[27] See Wood (1995) and Bell et al (1999) for an application to South Africa

[28] ULC analysis is based on a one factor Ricardian framework in which labour costs are the main determinant of export production.

learning or adjustment costs associated with imported technology (Wignaraja, 2001). Technological, productivity or institutional factors are important determinants of competitiveness (Boltho, 1996; Fagerberg, 1996; Lall, 1991, 2001b). In addition, factors such as levels of education, natural resource endowments and economic policies (e.g. tax rates) exert significant influences on the competitiveness of specific industries or sectors (Cockburn et al, 1998: 2). In addition, the aggregate measures do not reflect the influence of trade policy effects on competitiveness. Thus, in order to ascertain the impact of trade policy on competitiveness, one should undertake the analysis at the sectoral level.

Economic theory stipulates that prices are an important determinant of the direction and commodity composition of trade. Country X is deemed to be competitive in good A, if the price of good A (P_A) for country X is lower than the prices charged by its competitors in a common currency. Kravis and Lipsey (1971) undertook the pioneering study on price competitiveness. Using actual prices rather than unit values, international price competitiveness (IPC) is defined as:

$$IPC = \frac{P_i^*}{P_i} \quad \text{.....(1)}$$

where P_i = price of domestic product *i* in a common currency

P_i^* = foreign price of product *i* in a common currency

In terms of equation (1), an increase in IPC would indicate that the domestic product has become more internationally competitive (i.e. domestic prices have decreased relative to foreign prices). However, transport costs, packaging costs and other costs related to trade restrictions (e.g. tariffs) all influence price, and hence, can affect competitiveness. Any trade distorting measure (e.g. tariffs) affects price competitiveness (IPC) through it impact on domestic prices. Since prices reflect the effects of trade barriers (Bradford, 2003)[29], an analysis of the impact of tariff liberalisation on the prices (P_i) charged by domestic South African producers would indicate whether tariff liberalisation improved

competitiveness during the 1990s. In other words, *ceteris paribus*, one would expect tariff liberalisation to have led to a reduction in the prices of domestic producers (P_i). The reduction in P_i would positively impact on the competitiveness of domestic producers. Thus, by analysing the impact of tariff liberalisation on P_i, one could ascertain whether the tariff liberalisation implemented during the 1990s in South Africa promoted competitiveness. This can be done by estimating the pass-through elasticity of tariffs to domestic prices. This is the point of departure used in the analysis of price competitiveness in chapter seven of this study.

The neo-classical notion of export oriented industrialisation - usually taken to be a manifestation of price competitiveness - entails, trade liberalisation (usually low uniform tariffs), abolition of non-tariff barriers, real devaluation and the reduction of labour costs or increasing labour productivity through technological advances (Bajraj, 2001: 2). Within this context, the benefits of tariff liberalisation is its positive impact on competitiveness. Some additional indicators of the positive impact of tariff liberalisation on competitiveness would include the following:

- *"Static" efficiency effects:* Here one could consider two indicators. Firstly, a more efficient allocation and use of factor resources would mean that liberalising sectors would have grown faster than the non-liberalising sectors. Secondly, liberalisation should shift production away from import-competing to exporting sectors. Liberalising sectors should increase export production.
- *"Dynamic" efficiency effects:* In this regard there are four readily available indicators. Firstly, since liberalisation promotes technology transfers, then liberalising sectors should increase their share of higher valued added products in production as compared to non-liberalising sectors. Secondly, *"dynamic"* efficiency would also entail liberalising sectors increasing their share of higher valued added export products as compared to non-liberalising sectors. Thirdly, allocative efficiency entails production being in line with a country's factor endowments. In South

[29] This is premised on the assumption of perfect competition.

Africa's case, this could mean labour intensive production but dynamic efficiency gains would entail labour productivity increases in liberalising sectors outstripping those in non-liberalising sectors. So in effect, *"dynamic"* efficiency could entail increases in higher value added production and/or increases in labour productivity. Finally, liberalising sectors should be characterised by higher total factor productivity gains relative to non-liberalising sectors.

These indicators will form the basis of the analysis in chapter eight.[30]

3.6 Conclusion

In this chapter, the theory of protection was reviewed and it was found that the relationship between trade liberalisation and growth is ambiguous, both from a theoretical and empirical standpoint. In addition, the empirical evidence on the tariff-growth relationship yields similar results. This, in effect, means that trade policy effects are an empirical issue - the results could vary over time and across countries. This is particularly relevant for the objective of this study, namely, to ascertain the impact of tariff liberalisation on competitiveness.

The next chapter documents the tariff liberalisation undertaken during the 1990s with the primary objective of ascertaining the extent of tariff liberalisation undertaken during this period.

[30] This logic holds in a perfectly competitive world trading homogenous products and where qualitative factors (e.g. institutional influences) have no or little bearing on production outcomes. However, the effects of liberalisation on competitiveness may be vastly different under conditions of imperfect competition. This, in effect, means that the benefits of tariff liberalisation become an empirical issue.

CHAPTER FOUR

THE EXTENT OF TARIFF LIBERALISATION DURING THE 1990s[1]

4.1 Introduction

Import liberalisation is often seen as a means of encouraging export production. This motivation is underpinned by two factors. One is based on the view that increased competition (in the form of increased imports) will spur an efficient allocation of resources which in turn will increase competitiveness and hence exports. The other relates to Lerner's (1936) symmetry argument, where the removal of import protection is seen to be symmetrical to an export subsidy – the gist of the argument being that access to imported inputs at world prices is an important determinant of export production. South Africa's trade policy during the 1990s was premised on the belief that trade liberalisation was essential for export production. This is borne out in a recent policy document where it is argued that, *"…many of the manufacturing sub-sectors that experienced a rapid increase in their exports have benefited from substantial tariff reductions" (DTI, 2002: 15).*

On the basis of South Africa's tariff liberalisation schedule submitted under the GATT, it is widely acknowledged that there has been extensive tariff liberalisation during the 1990s (Tsikata, 1999; Roberts, 2000; van Seventer, 2001). However, recently it has been argued that the tariff liberalisation undertaken during the 1990s may not have matched up to initial expectations (Fedderke and Vaze, 2001). Before one could consider the effect of tariff liberalisation on competitiveness, one needs to ascertain if this recent evidence is true since tariff liberalisation has been one of the central tenets of government's trade policy in the 1990s. Thus, the primary objective of this chapter is to document the extent of tariff liberalisation in South Africa during the 1990s in the light of the recent evidence presented by Fedderke and Vaze (2001).

[1] I am grateful to an anonymous referee at the *South African Journal of Economics* for comments on a version of this chapter.

The next section provides a brief review of South Africa's policy of protection. In section 4.3 some theoretical issues relating to the effective rate of protection (ERP), which forms the basis of the analysis in this chapter, is highlighted. Section 4.4 uses ERP measures to analyse the extent of tariff liberalisation during the 1990s and some conclusions are drawn in the last section.

4.2 South Africa's protection policy[2]

There is consensus that South African industrialisation was founded on a policy of import substitution.[3] The path of the import substituting process in South Africa has been contested. McCarthy (1988), Fallon and de Silva (1994) and Joffee et al (1995) *inter alia*, have argued that South Africa followed the conventional industrialisation process - the industrialisation process began with the consumer goods industry and then moved on to "light" industry and finally the establishment of "heavy" industry. On the other hand, Fine and Rustomjee (1996) have contended that South Africa, engaged in the production of "heavy industry" before embarking on the production of consumer goods. There is, however, less debate on the instruments of trade policy used to support the industrialisation process in South Africa. Tariffs, quantitative restrictions and export incentives were the main trade incentives used to drive the industrialisation process. For Belli et al (1993), protection was granted selectively (during some periods to importers rather than on imports) and was premised on the infant industry argument (Fine and Rustomjee, 1996).

Export oriented industrialisation began to receive increasing attention in policy circles since the early 1970s.[4] The Reynders Commission recommended a diversification of the export base away from a reliance on gold exports. As Bell

[2] Since the focus of the study is on tariff reform during the 1990s only a brief review of protection prior to this period is provided. For a more thorough review see Bell (1993, 1997); McCarthy (1999) and Strydom (1995a)

[3] see, McCarthy (1988); Holden (1992) ; Bell (1993); Strydom (1995) and Fine and Rustomjee (1996) for a review and analysis of South Africa's industrialisation path.

[4] see Bell (1993, 1996) and TIPS (2002) for a review of the protective measures during 1970 to 2000.

(1996: 71) notes, the commission did not view import liberalisation as a necessary condition for non-gold export production. In 1972, a tax allowance for export marketing expenses was one of the first direct export incentives introduced by the government. A new system of export incentives was introduced in September 1980. By the beginning of the 1990s, the official policy stance was one of export-oriented industrialisation. The General Export Incentive Scheme (GEIS) was introduced on 1 April 1990 with the objective of encouraging the production of value added exports. However, while export subsidies were used to reduce the anti-export bias in the economy, the view that the path to export production should entail trade (and more specifically tariff) liberalisation began to gain ground. This is evident in the recommendations made by an official investigation into South Africa's tariff protection policy.

> *"Progress to greater export orientation, requires the responsible adjustment of the competitiveness of the existing industrial structure, which has been built up through import replacement, so as to enable it to deliver products at prices more in line with world prices. A generally accepted method of achieving this is to reduce tariffs and in addition, to follow a realistic exchange rate policy. The reduction of import tariffs is therefore an integral part of a process of progress towards export orientation" (IDC, 1990, i–ii).*[5]
>
> It is further argued in the same report that:
>
> *"the lowering of tariffs will, however, serve first and foremost to strengthen the export orientation of South Africa's trade policy"* (IDC, 1990: v)

There was thus a firm belief that the tariff protection policies (of the previous decades) created an anti-export bias and hence did not promote competitiveness and economic growth.

[5] The minister of trade, industry and tourism commissioned the Industrial Development Corporation, in collaboration with the Board of Trade and Industry, to *"…investigate the efficacy of the existing tariff protection policy"* (IDC, 1990: i).

At the beginning of 1990, the protection system consisted of quantitative restrictions, customs duties and import surcharges. In addition, the protection policy was subject to frequent changes, biased against exports and fairly complex (Fallon and De Silva, 1994: 81).[6] Table 1 captures the tariff protection prevailing at the beginning of the 1990s.[7]

Table 1: Nominal protection at the beginning of the 1990s

	Weighted mean	Unweighted mean	Minimum rate	Maximum rate	Coefficient of variation
Whole economy	28	29	0	1389	159.8
Agriculture	23	16	0	147	144.9
Mining	3	3	0	20	186.6
Manufacturing	28	30	0	1389	158.4
Consumer goods	60	48	0	1389	125.5
Intermed goods	17	18	0	1320	198.9
Capital goods	19	17	0	135	103.5

Source: Fallon and De Silva (1994: 83)

The overall statutory tariff, while not too high (approximately 28 percent) by international standards, had a wide dispersion. Within the manufacturing sector, consumer goods enjoyed the highest protection.

With the election of a democratic government in 1994, the economic policy bias towards exports as a major stimulant of economic growth was further entrenched. This is clearly borne out in the Growth, Employment and Redistribution (GEAR) strategy, which has since become a cornerstone of government policy. According to GEAR;

> *"…sustained growth on a higher plane requires a transformation towards a competitive outward-oriented economy" (RSA, 1996: 3).*

The challenge for economic policy was to create:

[6] The complexity was due to the variety of different tariff rates and exemptions granted on a firm-by-firm level rather than a product-by-product basis.

[7] The calculations were based on the 1989, 1990 and 1991 tariff schedules. In addition *advalorem* equivalent rates were calculated for formula duties and other specific duties.

> *"…a competitive platform for a powerful expansion by the tradable goods sector"* which is taken to mean, *"…accelerated growth of non-gold exports" (*RSA, 1996: 3)*.*

The growth employment and redistribution programme (GEAR) it is argued, is aimed at *"…strengthening the competitive capacity of the economy in the long term"* (RSA, 1996: 7).

Further, competitiveness in the tradable goods sector was to be achieved through, *"…a reduction in tariffs to contain input prices"* (RSA, 1996:: 4).[8]

It is quite apparent from the above that government policy was premised on the assumption that exports are vital for economic growth. In addition, export production acts as a disciplining mechanism forcing domestic producers to be efficient in order to succeed on the international market. Tariff liberalisation facilitates reduced input costs improved cost competitiveness, which in turn promotes export production.

By the mid 1990s, it was clearly evident that the government was committed towards abolishing GEIS partly as a result of its incompatibility with GATT rules and partly because of a policy shift that entailed tariff liberalisation as a means of reducing the anti-export bias in the economy. The government's tariff liberalisation policy culminated in South Africa's offer to the GATT in 1994 and implemented in January 1995 (see table 2).

[8] It is interesting to note that the objective of striving for international competitiveness is not meant to be isolated from social objectives. In fact one of the stated intentions of economic policy is *"…to support a competitive and more labour-intensive growth path"* (RSA, 1996: 7).

Table 2: South Africa's tariff phase-down under the WTO

ISIC		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
3	Textiles	30.1	33.8	31.8	24.9	23.4	21.9	20.3	18.7	17.3	17.3	17.3
4	Clothing,	73.7	73.6	68.2	54.6	50.5	46.4	42.4	37.7	33.2	33.2	33.2
5	Leather And leather products	14.9	14.8	14.1	16.5	15.7	14.8	14.8	14.8	14.8	14.8	14.8
6	Footwear	37.5	41.6	39.1	36.8	34.2	29.1	29.1	29.1	29.1	29.1	29.1
7	Wood and wood products	13.9	3.6	3.4	3.5	3.3	3.1	3.1	3.1	3.1	3.1	3.1
8	Paper And paper product	9.6	9.3	9.1	8.8	8.7	8.5	7.9	7.3	6.8	6.2	5.6
9	Printing And publishing	8.1	1.3	1.2	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0
10	Petroleum & petroleum products	1.6	-	-	-	-	-	-	-	-	-	-
11	Industrial chemicals	9.3	7.5	7.5	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.6
12	Other Chemical products	9.0	3.8	3.7	2.7	2.6	2.5	2.5	2.5	2.5	2.5	2.5
13	Rubber products	30.5	14.5	14.1	15.8	15.4	14.9	14.6	14.4	14.0	14.0	14.0
14	Plastic products	19.8	14.7	13.7	13.2	12.6	12.0	12.0	12.0	12.0	12.0	12.0
15	Glass and glass products	11.8	9.5	9.0	8.3	7.9	7.6	7.6	7.6	7.6	7.6	7.6
16	Non-metallic Mineral products	10.6	8.7	8.1	8.4	8.0	7.7	7.7	7.7	7.7	7.7	7.7
17	Basic iron and steel products	7.6	4.4	4.2	4.2	4.1	3.9	3.9	3.9	3.9	3.9	3.9
18	Non-ferrous Metal products	2.3	2.3	2.3	2.3	2.2	2.0	2.0	2.0	1.9	1.7	1.7
19	Metal products, excl mach	13.1	8.2	7.8	7.8	7.6	7.4	7.4	7.4	7.4	7.4	7.4
20	Non-electrical Machinery	6.5	1.4	1.3	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3
21	Electrical machinery	11.0	6.1	6.0	5.8	5.8	5.7	5.7	5.7	5.7	5.7	5.7
22	Radio, Television & comm	12.1	5.1	3.7	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3
23	Professional Equipment	7.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
24	Motor vehicles, parts and accessories	55.4	33.5	31.7	29.3	27.9	26.1	24.8	23.2	22.1	22.1	22.1
25	Other Transport equipment	1.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
26	Furniture	28.1	21.4	20.8	20.2	19.6	18.9	18.9	18.9	18.9	18.9	18.9
27	Other manufacturing	2.9	1.0	1.0	5.2	5.1	5.0	4.9	4.9	4.9	4.9	4.9
82	Mining	2.7	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Total		11.7	7.2	6.8	6.1	5.8	5.5	5.3	5.1	4.9	4.9	4.9

Source: Trade and Industrial Policy Strategies (TIPS). 2002. *The state of trade policy in South Africa.* Johannesburg, TIPS.

In terms of the GATT offer, South Africa agreed to bind 98 percent of all tariff lines and to cut tariffs by a third (Holden, 2001b). The offer to GATT clearly displayed a commitment to opening up the economy to foreign competition (TIPS, 2002).[9] In terms of the offer, industrial protection was to be reduced by more than half, from an average tariff of around 12 percent in 1994, to approximately 5 percent in 2001. The average import weighted tariff rates were to be reduced to lower rates even though it was well within the WTO bound rates - from 34 percent to 17 percent for consumption goods, 8 percent to 4 percent for intermediate goods and 11 percent to 5 percent for capital goods (TIPS, 2002: 11).[10]

South Africa's commitment to its liberalisation offer, is borne out by an analysis of the applied rates over the latter half of the 1990s. The average import weighted tariffs have been significantly reduced since the GATT offer. For agricultural products, the rate has been reduced from 9.23 percent (1996) to 1.4 percent (2000), while for industrial products it has been reduced from 11.4 (1996) percent to 8.6 percent (2000) (TIPS, 2002: 14). The average for the economy as a whole has seen applied rates come down from 11.3 percent in 1996 to 7.3 percent in 2000.

The extent of trade liberalisation during the 1990s is further illustrated by table 3. From Table 3 it is evident that import surcharges and export subsidies were abolished by 1998. Further, quantitative restrictions on agricultural and manufacturing imports were virtually eliminated by the end of the decade. In addition, the tariff schedule was rationalised to 7814 tariff lines in 1998, as compared to over 13000 in 1990.

The logical question that arises when one considers the tariff structure of any country, is how it compares with those of other countries. In tables 4 and 5, the tariff rate and non tariff barrier (NTB) coverage ratio imposed by a country

[9] This section is mainly based on information gleaned from TIPS (2002).
[10] The bound rates are 26 percent, 4 percent and 15 percent for consumption, intermediate and capital goods respectively.

Table 3: South Africa: Protection 1990 and 1998 (In percent, unless otherwise indicated)

Tariffs	1990	1998
Manufacturing		
Maximum tariff	1389	72
Average import-weighted tariff	28	10
Average unweighted tariff	30	14
Number of tariff bands	>200	72
Standard deviation	43	15
Number of tariff lines[1]	>13000	7814
Percent of tariff lines with non ad valorem duties[1]	28	26
Range of effective protection[2]	189 to –411	204 to –2
Average import-weighted surcharge[3]	6	0
Import surcharge bands	10, 15, and 40	eliminated
Agriculture		
Average tariff	25	2.2
Average import surcharge	8	0
Export subsidy[4]	17	eliminated
Export taxes		
Diamonds	15	15
Quantitative restrictions on imports[5] of which:	15	virtually eliminated
Agriculture	74	virtually eliminated
Manufacturing	14	virtually eliminated
Quantitative restrictions on exports; goods[3]	diamonds	Diamonds
	21 agric comm.	
Memorandum items:		
Trade tax revenue as share of total revenue	7.9	4.0
Import taxes as share of imports	10.8	4.1
Export subsidies as a share of GDP	0.3	0.0

1/ The figure for 1998 refers to June 1997.
2/ At ISIC three-digit level; excludes import surcharge.
3/ The figure for 1990 refers to 1992.
4/ Actual subsidy disbursements were 2.7 percent of exports in 1990/91.
5/ The figure for 1990 refers to 1992. As percent of total tariff lines (other than those mainted for health, security, and environmental reasons).

Source: IMF. 2000. South Africa: Selected issues. *IMF staff country report no. 00/42.* Washington, DC.: IMF.

on its imports is considered, as well as, the tariff rates and NTB coverage ratio imposed on a country's exports by her trading partners. These rates prevailed in 1994 and as such reflects the scenario prevailing before South Africa embarked on it's tariff liberalisation programme under the WTO offer.[11]

[11] Given the implementation of the WTO offer since 1995, the situation for SA would have improved quite drastically compared to the statistics reflected in table 4.3.

Table 4: Trade Protection Imposed by Each Importing Country in 1994

	Tariff		NTB's	
Country	**AVE (%)**	**COV**	**AVE (%)**	**COV**
Bangledesh	45,10	0,09	2,87	2,86
Algeria	21,85	0,84	15,60	1,99
Tunisia	21,72	0,57	6,84	2,66
India	19,09	0,72	10,58	1,23
Philippines	18,72	0,63	0,00	0,00
Kenya	18,65	0,89	0,00	0,00
Egypt	16,59	0,86	0,00	0,00
Jamaica	14,19	1,01	28,30	1,02
Mauritius	13,25	1,01	0,00	0,00
Sri Lanka	12,63	0,87	0,02	4,66
Poland	12,61	0,53	0,00	0,00
Madagascar	12,33	0,85	0,00	0,00
Hungary	12,09	1,13	0,00	0,00
China	12,00	0,81	2,21	2,49
Cameroon	11,50	0,79	0,00	0,00
Cote d'Ivoire	11,32	0,87	0,00	0,00
Mexico	11,26	0,67	17,11	1,39
Peru	11,16	0,53	5,88	2,88
Argentina	10,51	0,57	5,49	1,89
Congo	10,48	1,12	0,00	0,00
Ecuador	10,11	0,73	0,00	0,00
Venezuela	10,09	0,61	11,79	1,87
Gabon	9,79	0,60	0,00	0,00
Malawi	9,78	1,26	0,00	0,00
Nicaragua	9,52	0,95	4,45	4,36
Bolivia	9,40	0,97	0,00	0,00
Thailand	9,14	0,64	17,22	1,70
Chile	9,01	0,43	3,47	3,96
Costa Rica	8,87	1,20	0,00	0,00
Brazil	8,72	1,08	11,73	1,63
Dominican Republic	8,42	1,12	0,00	0,00
Central African Republic	8,31	1,23	0,27	6,52
Chad	8,25	1,30	0,00	0,00
Trinidad & Tobago	8,15	0,82	0,00	0,00
Uruguay	7,90	0,78	2,01	2,53
Saudi Arabia	7,71	0,72	0,04	6,50
Korea, Republic of	7,48	0,69	0,16	4,07
Guaternala	7,21	0,79	0,00	0,00
Turkey	7,13	1,00	0,62	2,08
Honduras	6,77	0,85	0,00	0,00
Morocco	6,19	1,59	2,56	2,48
Indonesia	6,04	0,73	0,00	0,00
South Africa	5,81	0,78	0,00	0,00
Paraguay	5,74	1,00	0,00	0,00
El Salvador	5,67	1,08	13,21	1,35
Colombia	5,23	1,08	0,00	0,00
Malaysia	5,19	1,36	5,46	2,58

Table 4: Trade Protection Imposed by Each Importing Country in 1994 (continued)

Canada	5,16	0,93	13,16	1,56
Czechoslovakia	4,79	0,63	0,36	5,72
United States	4,67	1,36	19,76	1,01
European Union	4,45	0,60	22,16	1,07
Norway	3,87	1,19	6,55	2,04
Iceland	3,79	1,33	0,71	3,76
New Zealand	3,62	0,91	0,89	4,85
Australia	3,53	0,77	0,90	3,15
Oman	3,43	1,43	2,85	2,62
Israel	3,28	1,27	0,00	0,00
Japan	2,81	0,71	2,71	1,42
Singapore	0,00	0,00	3,16	3,83
Switzerland	0,00	0,00	0,00	0,00
Hong Kong	0,00	0,00	0,00	0,00

Source: WANG, Q. 2001. Import-reducing effect of trade barriers: A cross-country investigation. *IMF working paper no. WP/01/216.* Washington: IMF.

Table 5: Trade Protection faced by each exporting Country in 1994

	Tariff		NTB's	
Country	**AVE (%)**	**COV**	**AVE(%)**	**COV**
Mauritius	10,67	1,49	9,11	2,45
China	10,31	1,21	3,17	3,75
Madagascar	10,20	1,68	1,65	3,78
Bolivia	10,10	1,47	6,57	3,12
Ecuador	9,88	1,35	6,59	3,13
Hungary	9,84	1,38	6,71	2,11
Sri Lanka	9,71	1,45	5,24	2,85
Morocco	9,69	1,52	4,54	2,17
Guatemala	9,40	1,70	7,23	3,03
Iceland	9,22	1,50	1,02	3,71
Hong Kong	9,19	1,56	5,52	1,93
Cameroon	9,10	1,74	4,78	4,06
Argentina	9,03	1,45	6,53	2,45
New Zealand	8,70	1,39	5,91	2,92
Turkey	8,66	1,62	5,52	2,24
Colombia	8,56	1,29	4,96	3,75
Trinidad & Tobago	8,48	1,71	2,94	3,87
Korea RP	8,46	1,60	5,23	1,85
Singapore	8,41	1,62	3,19	2,04
Czechoslovakia	8,31	1,25	3,05	2,32
Oman	8,21	1,29	2,67	2,83
Jamaica	8,18	1,53	3,94	1,93
South Africa	8,16	1,56	2,44	2,41
Bangladesh	8,14	1,25	8,24	2,69
Chile	8,14	1,29	3,05	4,27
Egypt	8,02	1,37	5,70	2,51
Japan	7,96	1,54	4,10	2,29
Malawi	7,93	1,50	0,97	4,96
Uruguay	7,90	1,45	5,70	2,92
Tunisia	7,86	1,26	5,31	2,86
Malawi	7,60	1,59	3,81	2,49
Peru	7,57	1,40	2,69	2,69

Table 5: Trade Protection faced by each exporting Country in 1994 (continued)

Thailand	7,27	1,64	4,07	2,46
Gabon	7,25	1,34	5,22	2,56
El Salvador	7,13	1,36	9,59	2,58
Mexico	7,06	1,30	2,86	2,97
Australia	7,06	1,54	2,45	2,57
Cote d'Ivoire	6,94	1,47	1,35	4,80
Poland	6,93	1,52	2,93	2,68
Philippines	6,84	1,60	5,65	2,62
Canada	6,79	1,53	3,84	2,90
Brazil	6,78	1,34	2,33	2,46
Switzerland	6,71	1,69	2,08	3,18
European Union	6,69	1,60	4,15	1,91
Venezuela	6,68	1,37	3,97	4,23
Nicaragua	6,52	1,27	2,44	4,33
Honduras	6,50	1,36	3,63	4,03
Norway	6,41	1,68	2,12	2,51
Kenya	6,39	1,54	3,77	3,83
Israel	6,30	1,82	3,74	3,00
United States	6,08	1,46	2,78	2,34
India	5,79	1,22	5,20	2,30
Dominican Republic	5,69	1,35	3,13	3,38
Paraguay	5,37	1,28	4,59	3,28
Saudi Arabia	5,24	1,22	2,42	5,37
Algeria	5,04	1,84	2,21	5,93
Indonesia	5,01	1,27	3,94	3,66
Chad	3,95	1,82	1,10	7,24
Congo	3,72	1,70	0,23	7,65
Central African Republic	3,69	2,34	0,53	5,31
Costa Rica	3,38	1,42	4,11	4,43

Source: WANG, Q. 2001. Import-reducing effect of trade barriers: A cross-country investigation. *IMF working paper no. WP/01/216.* Washington: IMF.

From table 4, it is apparent that South Africa features towards the bottom of the list when it comes to the tariff rates imposed on total imports. The average rate of 5.81 percent in 1994 was just above that of more industrialised countries like the European Union (4.45 percent) and United States (4.79 percent). South Africa makes little use of NTBs – unlike the other (mainly developed) countries which make wide use of NTBs as a protective device. In fact, Wang (2001) finds that, in general countries of lower per capita income impose higher tariffs, while countries of higher per capita income tend to make greater use of NTBs as a protective device.[12] It is also interesting to note that

[12] According to Wang (2001) this could be due to NTBs being more costly to impose in terms of the institutional requirements while tariff barriers are more attractive to developing countries for revenue generating purposes.

South Africa's tariff structure, while quite discriminatory, is not out of line with those of other countries.[13]

As far as exports are concerned, South African exports faced an average 8.16 percent tariff. South Africa was in the top half of the list, indicating that South African products faced higher trade barriers than many of the other countries on the list. Many of the more industrialised countries on the list enjoyed more favourable market access than South Africa.[14]

It is evident that South Africa's overall tariff structure is not overly protective in comparison to other countries. On the other hand, South Africa's exports face higher levels of discrimination in export markets. This suggests that bilateral agreements (e.g recent free trade agreements with the EU and Southern African Development Community (SADC) and others proposed with Mercursor and the US) seeking improved market access for South African products is a step in the right direction.

In summary, the statistics confirm that at least in terms of a reduction in nominal tariff rates on output, South Africa has made significant strides down the tariff liberalisation path. However, the question is whether this is still the case, if one considers the combined effects on both inputs and outputs. The remainder of this chapter considers this issue more explicitly.

4.3 Analysis of effective protection

Corden (1966, 1969, 1971a, 1971b) is credited with having formalised the theory of effective protection. However, as Greenaway and Milner (2002: 2) note, economists like Taussig, Haberler and Meade, decades earlier signalled the importance of considering tariffs on inputs when analysing protection. The appeal of the ERP measure lies in the fact that it takes into account tariffs imposed on the final product, as well as, on the intermediate inputs used in the production of that product. In other words, the ERP indicates the total

[13] The country's regime is deemed more discriminatory, the larger its covariance.
[14] These countries include EU (6.69 percent) and United States (6.30 percent) which is largely due to the influence these countries have in WTO negotiations.

effect on domestic production (value added) of an existing tariff structure (Carbaugh, 2000: 116-117).

With perfect competition, protection (on output and inputs used in the production process) will result in domestic value added diverging from the level prevailing under free trade. The standard measure of the ERP is given by:[15]

$$ERP = \frac{V_t - V_{ft}}{V_{ft}} \quad \text{.....(2)}$$

Where value added under protection is given by V_t and value added under free trade by V_{ft}. Considering a linear relationship between inputs and outputs with a_{ij} the input-output coefficient for the i^{th} input used in the production of the j^{th} output. Considering the nominal tariff level on j (t_j), nominal tariff on input i (t_i) and the share of inputs i in the costs of j without tariffs ($\sum_i a_{ij}$) the ERP measure is given by:

$$ERP = \frac{t_j - \sum_i a_{ij} t_i}{1 - \sum_i a_{ij}} \quad \text{.....} \quad (3)$$

Equation 3 is a common measure used in ERP calculations. It highlights two important points. Firstly, the overall tariff structure has a tax and subsidy element with the tariff on the output (input) being equivalent to a subsidy (tax) (Greenaway and Milner, 2002). Secondly, effective protection can be negative, that is, an activity can be worse off due to protection on inputs exceeding that on the final product.

The theoretical shortcomings of the ERP concept have been well documented (Jones, 1971; Ethier, 1971, 1977; Bhagwati and Srinivasan, 1973).[16] More

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[15] See Greenaway (1983) for an elegant review of the concept and an exposition of how it can be measured. Holden (1999) provides a good review of the development of the theory.

[16] Some of these shortcomings include the imperfect substitutability between imported and local products, the treatment of non-tradable inputs in the measurement of the ERP, measurement of tariff equivalents of non tariff barriers and the allocation of intermediate inputs to multiple outputs.

recently Anderson (1998) has also challenged the usefulness of ERP calculations as a measure of protection.[17] In the light of these criticisms it is important to consider the relevance or validity of ERP analysis. In this regard it has been argued that *"…even though the theoretical validity of ERP as an indicator of resource pull is somewhat less than was initially asserted or hoped for, it continues to be a nice way to summarise the information on the protection structure resulting from tariffs on inputs and outputs … if ERPs are used with some care … even their analytical use can be somewhat suggestive"* (Bhagwati and Srinivasan, 1973: 131, quoted in Greenaway and Milner, 2002: 16).

Thus, ERP measures can help in *"identifying the probabilities or effects on average that may be expected from reforms ... with production falls likely to happen on average in the sectors experiencing declines in effective protection"* (Greenaway and Milner, 2002: 12). Given the theoretical shortcomings, the ERP calculations may not necessarily provide the best measure of the likely pull on resources, but in the light of data constraints it may still provide the best description of the overall structure of *tariff* protection.[18] Changes in the ERP may therefore provide a useful indicator of the extent of *tariff liberalisation*.

There are two ways of interpreting the extent of tariff liberalisation from ERP calculations. The first is to consider the difference in ERP measures between two periods; large reductions in the measures will show that the particular sector in question has been subjected to extensive tariff liberalisation.[19] An alternative is to consider the relative importance of the sectors being subjected to tariff liberalisation. Summing the contributions to GDP of all those sectors that have been liberalised (or subjected to increased tariff protection) between any two periods would indicate whether the major part of a country's

[17] Holden (2001a) has found that for the South African economy there was not a robust relationship between trade policy changes (as depicted by ERP rates) and resource allocation during the 1990s.

[18] Since tariff rates are the only protection measures used in the calculations, the ERP in essence measures tariff protection. ERP measures also provide insights into the phenomenon of tariff escalation.

output has been liberalised or subject to increased protection. This is the approach undertaken in the study by Fedderke and Vaze (2001) and is also the one used in this study.

4.4 Trade (tariff) liberalisation and the ERP: the case of South Africa during the 1990s

Effective protection captures the net protection accorded to an industry by taking into account the protection imposed on both output and intermediate inputs used in the production process. Various studies have used ERP analysis to appraise South Africa's protection policy during the 1990s (IDC, 1996a, 1996b; Fedderke and Vaze, 2001; TIPS, 2002). Recently, Fedderke and Vaze (2001) - hereafter referred to as the FV study - have explicitly questioned the extent of tariff liberalisation in the 1990s.[20] The study claims that *"more of South Africa's output is protected by tariffs in 1998 than in 1988"* and hence concludes that: *"…the much-hyped liberalisation of the South African economy in the 1990's has not been fully realised"* (Fedderke and Vaze, 2001: 447). Using a similar methodology, this chapter will appraise this result of the FV study.

The FV study analyses the protection accorded to 38 economic sectors. Average EPRs (based on tariff duties collected) were calculated for the period 1988-93 and 1994-98. Sectors were classified as more protected (P) if the EPR increased by more than 1 percent, liberalised (L) if it decreased by more than 1 percent and moderately protected (M) otherwise. In terms of these criteria, 8 sectors were classified as more protected, 16 as moderately protected and 14 as liberalised. The FV study claims that the 8 protected sectors accounted for more that 50 percent of the GDP in 1998.

A defining characteristic of this study relates to the use of collected customs duties to estimate the tariff rates rather than the use of statutory tariff rates in

[19] There is however an element of subjectivity involved in deciding the benchmarks for what could be considered large or extensive tariff liberalisation.

[20] The study also establishes a positive relationship between tariff liberalisation and export production. The results pertaining to this aspect are not analysed in this paper.

the calculations of ERPs. There are a couple of points that can be made in this regard. The first relates to high or prohibitive tariff rates not being reflected in the customs revenues collected. Secondly, it is important to recognise that in the case of South Africa, imports are recorded when they land in the country while import duties are only paid when goods leave the warehouses at the port. Thus, it is possible that in some cases, importers only pay the customs duties after the year in which the imports were reflected in customs records. In these cases, tariff calculations based on revenue collections will understate the "actual" tariff rates applicable to the products. It is unclear to what extent this issue has been addressed in the FV study.[21]

Table 6 captures the ERP calculations for the different sectors of the South African economy. The 38 sectors considered in the FV study are reflected in rows 1 to 38, while rows 39 to 46 reflect the sectors that are omitted in this study.[22] In addition, the contributions to value added are captured for all the sectors for the years 1988, 1998 and 2001 under columns 2 to 4. The ERP calculations (averages for period 1988-93 and 1994-98) are reflected in columns 5 and 6. Some derivations from the ERP calculations and trade policy classifications are depicted in columns 7 to 10.

Since the FV study considers only 38 sectors, it is important to ascertain the relative importance of these sectors in the economy. The 38 sectors considered in the FV study made up 72 percent (62 percent) of total GDP in

[21] This is not to state that statutory rates are superior. In fact, the issue of whether statutory rates (rather than collected rates) are more appropriate is debatable. Statutory rates, for example, do not reflect rebates and does not capture the effects of smuggling.

[22] These are mainly non-tradable sectors.

Table 6: Extent of Trade liberalisation in South Africa (ERP calculation based on collected tariff revenues)

	Sector	Contribution to value added Rm			Average ERP for 1988-93	Average ERP for 1994-98	Change in EPR (FV class)[1]	% change in EPR[2]	Liberalisation stance (FV class)	Liberalisation (% change in EPR)
		1988	1998	2001						
	[1]	[2]	[3]	[4]	[5]	[6]	[7]=[6]-[5]	[8]=[7]/[5]*100	[9]	[10]
1	Paper and Paper products	1655	5571	7462	1.145	0.616	-0.529	-46	L	L
2	Glass and glass products	351	1020	1313	0.987	0.564	-0.423	-43	L	L
3	TV radio and equipment	884	2337	3050	0.115	0.046	-0.069	-60	L	L
4	Plastic products	1062	4146	6953	0.187	0.118	-0.069	-37	L	L
5	Footwear	462	719	578	0.300	0.244	-0.056	-19	L	L
6	Furniture	1105	3011	3196	0.092	0.038	-0.054	-59	L	L
7	Basic Iron and Steel	3094	9590	10612	0.210	0.164	-0.046	-22	L	L
8	Motor vehicles Parts	3074	8387	12670	0.063	0.032	-0.031	-49	L	L
9	Wearing apparel	1315	4305	4508	0.115	0.084	-0.031	-27	L	L
10	Other manufactures	1351	6267	6419	0.045	0.014	-0.031	-69	L	L
11	Basic Chemicals	1809	6384	8186	0.058	0.028	-0.030	-52	L	L
12	Basic non ferrous metals	1268	4740	6374	0.063	0.044	-0.019	-31	L	L
13	Professional and scientific prod	289	508	679	0.098	0.084	-0.014	-15	L	L
14	Electrical machinery	3210	6754	8768	0.042	0.030	-0.012	-28	L	L
15	Electrical, Gas and Steam	7081	19249	20658	0.070	0.062	-0.008	-11	L	L
16	Other transport	832	1034	1440	0.008	0.002	-0.006	-76	L	L
17	Rubber	602	1356	1930	0.170	0.164	-0.006	-4	L	M
18	Chemicals & Man made fibres	2525	10269	13975	0.040	0.034	-0.006	-15	L	L
19	Wood and wood production	765	2831	3337	0.018	0.014	-0.004	-24	L	L
20	Building Construction	4836	14126	15947	-0.007	-0.008	-0.001	20	M	P
21	Non metallic minerals	1510	3775	4660	0.008	0.008	0.000	-4	M	M
22	Med, dental, health and veterinary	1781	12027	16180	0.000	0.000	0.000	0	M	M
23	Metal prod excluding machinery	3031	8124	10028	0.010	0.010	0.000	0	M	M
24	Coal Mining	3287	9532	13797	-0.010	-0.010	0.000	0	M	M

Table 6 (continued)

25	Transport and Storage	14625	43850	53283	0.000	0.000	0.000	0	M	M
26	Wholesale and Retail Trade	22910	83206	108684	0.000	0.000	0.000	0	M	M
27	Coke and refinery petrol	2471	5531	6631	-0.013	-0.012	0.001	-10	M	L
28	Machinery & Equipment	2479	6311	7875	-0.002	0.000	0.002	-100	M	L
29	Beverages	1912	7611	9684	0.008	0.012	0.004	44	M	P
30	Printing, publishing and recording	1277	4372	6191	0.130	0.134	0.004	3	M	M
31	Other Mining	5229	17846	35019	-0.062	-0.054	0.008	-12	P	L
32	Finance and Insurance	12080	51943	79988	-0.195	-0.184	0.011	-6	P	M
33	Leather	167	284	605	0.207	0.218	0.011	5	P	M
34	Gold and Uranium Mining	13348	17410	19752	0.000	0.012	0.012	**	P	M
35	Agriculture, Forestry and Fishing	11197	24700	27730	0.052	0.064	0.012	24	P	P
36	Food	4642	13802	16472	0.027	0.064	0.037	140	P	P
37	Textiles	1652	3317	3555	0.093	0.136	0.043	46	P	P
38	Tobacco	292	951	1117	0.035	0.124	0.089	254	P	P
39	Water supply	1064	3628	3598						
40	Excluding medical, dental and veterinary services	1682	7929	10107						
41	Catering and accomod services	2190	7913	8407						
42	Civil engineering and other constr	2869	9660	11479						
43	Communication	3788	21488	37429						
44	Other producers	6317	20519	27200						
45	Business services	13969	74553	106254						
46	General government services	25571	120342	145270						
47	Contr to GDP of 38 sectors: L								23;23;22	30;30;30
48	(FV study) M								43;46;45	53;55;56
49	P								34;30;33	17;15;13
50	Contribution to total GDP: L								16;14;13	21;18;19
51	M								30;29;28	38;34;34
52	P								25;19;20	12;9;8

Notes 1.Change in the average ERP for the period 1988-93 and 1994-98.
2.Percentage change in the average EPR between the period 1988-93 and 1994-98

Source: Own calculations with data from Fedderke and Vaze (2001); Trade and Industrial Policy Strategies Database.

1988 (1998).[23] The first point to bear in mind is that the relative importance of the 38 sectors has decreased over the period. Thus, the conclusions in the FV study are based on an analysis of only around two-thirds of the South African economy. The question therefore is whether the results of the FV study still hold if the analysis (calculations) is (are) done with reference to the whole economy?

As pointed out above, FV classify the sectors on the basis of the change in the average ERP between the two periods (1988-93 and 1994-98). The calculations and classifications are reflected in columns 7 and 9 respectively. As per the FV study, column 9 depicts the 14 sectors that were liberalised (L), 16 sectors that were moderately (M) protected and 8 sectors that enjoyed increased levels of protection (P) between the two periods. The relative importance of the sectors to the GDP of the 38 sectors considered in the FV study and the overall economy are reflected under column 9 (rows 47 to 52).[24] As an illustration consider column 9, row 47. The 14 liberalised sectors made up 23 percent (in 1988 and 1998) and 22 percent (in 2001) of the GDP of the 38 sectors considered in the FV study. This contribution is higher than that recorded in the FV study.[25] However, in terms of the overall significance of the tariff liberalisation, column 9 (row 50), indicates that these 14 sectors' contribution to the total GDP of South Africa decreased from 16 percent (1988) to 14 percent (13 percent) in 1998 (2001). Similarly, the 16 moderately protected sectors' contribution to the GDP of the 38 sectors increased from 43 percent (1988) to 46 (1998) to 45 percent (2001) while the contribution to the overall economy decreased from 30 percent (1988) to 29 percent (1998) to 28 percent (2001).[26] The sectors enjoying more protection decreased their contribution to the GDP of 38 sectors from 34 percent in 1988 to 30 percent in 1998 before increasing to 33 percent in 2001. These sectors' contribution to

[23] These calculations are captured in rows 50 to 52; an explanation on how to interpret these representations is provided later on in this section. By 2001 these sectors made up 61 percent.
[24] The relative importance is for the years 1988, 1998 and 2001.
[25] The FV study records that the liberalised sectors account for just over 15 percent of the total GDP from the 38 sectors.
[27] Classified as M in the table.

the economy decreased from 25 percent in 1988 to 19 percent (20 percent) in 1998 (2001). These results refute the claim made in the FV study that: *"…more of South Africa's output is protected by tariffs in 1998 than in 1988"* (Fedderke and Vaze, 2001: 447). By 2001, liberalised (protected) sectors accounted for 13 percent (20 percent) of total GDP in 2001. Whereas the percentage of output enjoying tariff protection was higher than that subject to tariff liberalisation, the protected sectors did not make up the major proportion of the country's GDP.

An important factor influencing the results and conclusions reached in the FV study relate to the classification of the extent of liberalisation. The calculations as undertaken by FV for the classification of the sectors as liberalised (L), moderately protected (M) or protected (P) do not capture the relative significance of the change in the ERP. From table 4 for example, the 0.6 percent reduction in the ERP between the two periods represents a 4 percent and 76 percent decrease in the ERP for the rubber (row 17) and other transport sectors (row 16) respectively. Column 8 captures the percentage change in the ERP measures between the two periods (1988-93 and 1994-98).[27] All sectors that experienced a reduction (increase) of at least 10 percent in their ERP measures are classified as liberalised (protected) and moderately protected otherwise (classification reflected under column 10).[28] In terms of this classification, 21 sectors are classified as liberalised, 11 sectors as moderately protected and 6 sectors as protected. In terms of the contribution to total value added, the protected sectors made up 12 percent of total GDP in 1988 as compared to 9 percent (8 percent) in 1998 (2001).[29] Stated differently, it is apparent that *less* of South Africa's output enjoyed tariff protection in 2001 (or even in 1998) than in 1988.

In terms of both the classifications used, it is apparent that the protected (liberalised) sectors made up approximately 8-20 percent (between 13-19 percent) of total GDP in 2001 as compared to between 12-25 percent (16-21

[27] This captures the relative rather than the absolute change in the ERP.
[28] It is acknowledged that the 10 percent dividing line is arbitrary and as such is only suggestive.
[29] See row 52, column 10 in table 4.

percent) in 1988.[30] Thus, contrary to what is claimed in the FV study, it is apparent that more of South Africa's output *was not* protected by tariffs in 1998 (or even in 2001) as compared to 1988.

However, it should be remembered that the tariff calculations used thus far were based on collected rather than on statutory rates. Thus, the question is whether the situation changes when one considers statutory rates? In order to ascertain if this is indeed the case, ERP calculations based on statutory rates as undertaken by the IDC (1996a) are considered. Table 7 reflects these ERP calculations for 1993 and 1999.

The objective is to ascertain if the analysis portrayed above is corroborated by these calculations. Due to data constraints we are not able to undertake a comparison across all the sectors included in the IDC study.[31] However, there are sufficient data points to provide at least an indication of the extent of trade liberalisation. Table 7 (columns 10 and 11) also reflects the same two classifications used above to capture the trade policy stance during 1993 and 1999. Considering the relative percentage change in ERP between 1993 and 1999, the liberalised (protected) sectors contribution to the sales of the 51 manufacturing industries, decreased from 67 percent (11 percent) in 1993 to

[30] In 1998 protected (liberalised) sectors contributed between 9 and 19 percent (14 and 18 percent) to total GDP.

[31] The main constraints relate to the industry classifications used in the IDC study. The industry classification in the IDC study is at the SIC version 3 level while sectoral data is currently available only at SIC version 5 level. A link provided by the TIPS was used to link 51 SIC version 3 manufacturing sectors (of the 71 sectors considered in the IDC studies) with their corresponding sales data. Hence the point to bear in mind is that while all the sectors of the economy are not considered, the results are nevertheless indicative of the extent of liberalisation undertaken during the 1990s. Sales data was used as a proxy for contribution to GDP due to the unavailability of GDP data on an SIC (version 5) 4 digit level.

Table 7 : Extent of trade liberalisation (ERP calculations based on statutory rates)

			Contribution to total sales								
	sic v3		1990	1993	1999	ERP 1993	ERP 1999	Absolute ERP change in 93-99	% change in ERP 93-99	Liberalisation stance (absolute change in ERP)	Liberalisation stance (% change in ERP)
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]=8/6*100	[10]	[11]
1	3116	Grain mill products	5004	7198	9847	0.03	-0.11	-0.14	-467	L	L
2	3114	Canning Preserving & Processing of fish	794	1266	1533	0.12	-0.05	-0.17	-142	L	L
3	3133	Malt Liquors & Malt	4235	5261	8967	0.16	-0.04	-0.2	-125	L	L
4	3522	Medical & Pharmaceutical preparations	2796	3436	5781	0.13	-0.03	-0.16	-123	L	L
5	3420	Printing & Publishing	5107	7063	11665	0.11	-0.02	-0.13	-118	L	L
6	3901	Jewellery and related articles	1558	1602	2449	0.21	-0.03	-0.24	-114	L	L
7	3512	Fertilizers & pesticides	1790	2311	5932	0.08	-0.01	-0.09	-113	L	L
8	3529	Other chemical products	3233	3625	6882	0.17	0	-0.17	-100	L	L
9	3134	Soft Drinks & Carbonated waters inds	2266	3089	6092	0.4	0.01	-0.39	-98	L	L
10	3839	Other electrical apparatus & supplies	583	712	1004	0.3	0.02	-0.28	-93	L	L
11	3121	Other, food products	2580	3690	6419	1.42	0.1	-1.32	-93	L	L
12	3851/4	Other transport	1539	1679	2789	0.21	0.02	-0.19	-90	L	L
13	3115	Vegetable, animal oils & fats	1969	2901	5566	0.63	0.06	-0.57	-90	L	L
14	3310	Wood & Wood products excluding furniture	3508	4580	8355	0.19	0.02	-0.17	-89	L	L
15	3521	Paints vanishes & lacquers	1253	1727	3683	0.95	0.1	-0.85	-89	L	L
16	3213	Knitting mills	1195	1370	1859	2.82	0.4	-2.42	-86	L	L
17	3832	Radio, Television & comm. equip	2571	2772	4441	0.2	0.05	-0.15	-75	L	L

Table 7 : Extent of trade liberalisation (ERP calculations based on statutory rates) (continued)

18	3831	Electrical industrial machinery	630	808	2130	0.16	0.04	-0.12	-75	L	L
19	3710	Iron & Steel basic industries	13362	15041	26057	0.12	0.04	-0.08	-67	L	L
20	3119	Cocoa, Chocolate & Sugar confectionery	1204	1552	2911	0.34	0.13	-0.21	-62	L	L
21	3819	Other fabricated metals excluding machinery	5963	7560	11054	0.3	0.13	-0.17	-57	L	L
22	3523	Soap, cosmetics & toilet preparations	2519	3824	7606	1.26	0.57	-0.69	-55	L	L
23	3220	Wearing apparel excluding footwear	4848	5837	9136	3.54	1.62	-1.92	-54	L	L
24	3211	Spinning, Wool weaving & finishing of fabrics	3907	4586	6305	1.23	0.6	-0.63	-51	L	L
25	3412	Paper containers	2970	3720	6814	0.5	0.28	-0.22	-44	L	L
26	3620	Glass & Glass products	1612	1606	2141	0.16	0.09	-0.07	-44	L	L
27	3551	Tyres & Tubes	875	826	972	0.48	0.31	-0.17	-35	L	L
28	3559	Other rubber products	1744	2077	3195	0.2	0.13	-0.07	-35	L	L
29	3240	Footwear	1807	2131	2379	0.75	0.49	-0.26	-35	L	L
30	3560	Other plastic products	4328	5810	9723	0.48	0.34	-0.14	-29	L	L
31	3811	Cutlery, Hand tools & General hardware	975	1115	1839	0.31	0.27	-0.04	-13	L	L
32	3111	Slaughtering Preparing & Preserving Meat	2653	3349	5693	5.13	4.49	-0.64	-12	L	L
33	3419	Other Pulp, paper & paperboard	1185	1880	3567	0.27	0.25	-0.02	-7	L	M
34	3843/0	Motor vehicles	15497	20883	42720	1.21	1.13	-0.08	-7	L	M
35	3833	Electrical appliances & house wares	1205	1358	1926	0.56	0.56	0	0	M	M
36	3411	Pulp, Paper & Paperboard	4361	4999	10019	0.08	0.08	0	0	M	M
37	3691	Bricks, Tiles, re-factories, etc.	1466	1594	2431	0.17	0.17	0	0	M	M
38	3692	Cement	1224	1632	2313	-0.02	-0.02	0	0	M	M
39	3511	Industrial chemicals	712	793	1391	0	0	0	0	M	M
40	3610	Pottery, China & Earthenware	226	230	270	0.32	0.33	0.01	3	P	M

Table 7 : Extent of trade liberalisation (ERP calculations based on statutory rates) (continued)

41	3320	Furniture	3028	3451	6356	0.5	0.53	0.03	6	P	M
42	3212	Made-up textile goods, exc wearing apparel	992	1257	1659	0.77	0.82	0.05	6	P	M
43	3219	Textiles, not elsewhere classified	423	614	1105	0.15	0.2	0.05	33	P	P
44	3233	Leather products & leather substitutes	871	1065	2578	0.57	0.81	0.24	42	P	P
45	3214	Carpets & rugs mats & matting	459	610	701	0.6	0.86	0.26	43	P	P
46	3113	Canning & preserving of fruit & vegetables	2180	2720	4489	0.32	0.49	0.17	53	P	P
47	3117	Bakery products	2598	3577	4157	0.85	1.62	0.77	91	P	P
48	3131	Distilleries & wineries	2699	3226	5546	0.44	1.85	1.41	320	P	P
49	3122	Prepared animal feeds	2380	2987	5025	-0.2	1.19	1.39	695	P	P
50	3112	Diary Products	3227	4601	7165	0.16	1.84	1.68	1050	P	P
51	3118	Sugar factories & refineries	2124	2528	4473	0.1	4.99	4.89	4890	P	P
52		Contribution to sales of 51 sectors L								80;81	67;66
53		M								6;6	21;25
54		P								13;13	11;10
55		Contribution to manufacturing sales L								60;61	50;49
56		M								5;5	16;18
57		P								10;10	8;8

Source: IDC, 1996a; *Trade and Industrial Policy Strategies Database*, own calculations

66 percent (10 percent) in 1999.[32] Similarly the contribution to total sales of the manufacturing sector has decreased from 50 percent (8 percent) to 49 percent (8 percent) for the liberalised (protected) industries during 1993 and 1999. Similarly, by considering the absolute change between 1993 and 1999, it is noted that the protected sectors made up around 10 percent of total manufacturing sales, whilst liberalised sectors contributed approximately 61 percent of total sales during the period under analysis.[33] These results suggest that by the end of the 1990s, more of South Africa's manufacturing output was liberalised than protected.

There is an additional issue relating to the tarrification of the agricultural sector that warrants mention given the influence it could exert on the calculations undertaken in both the FV study and in this chapter. As part of the WTO commitment, quantitative restrictions were converted into *ad-valorem* rates during the 1990s (TIPS, 2002). This has a direct effect on the tariffs collected and could lead to increases in duties collected. It could be the case that the agricultural sector's protection is overstated and those of the other industries using agricultural inputs being understated. This problem exists also if statutory rates are used in the calculation of the ERP. However, in terms of the calculations in this study, the agricultural sector is classified as enjoying more protection during the 1990s and as such, biases the total output under protection upwards. If the tarrification of the agricultural sector does not represent an increase in the protection to this sector, the output of the agricultural sector would not form part of the total output under protection. This would lend further support to the argument presented in this chapter. On the other hand, if agriculture's protection is overstated, then the protection of the other industries using agricultural inputs, is understated and this could influence the strength of the argument. However, the information on the tariff revenues collected on agricultural products would seem to suggest that the tarrification measures did not lead to a significant increase in protection for the

[32] The calculations and classifications are represented in columns 9 and 11 respectively.

[33] The classification used here is similar to the one used in the previous table. A one percent reduction classifies the sector as liberalised, a one percent increase as protected and moderately protected otherwise.

agricultural sector. The tariff rate for agriculture increased marginally from1.4 percent in 1993 to 1.7 percent in 1994 before decreasing again to 1.4 percent in 1995.[34]

4.5 Conclusion

During the 1990s there was a deliberate attempt on the part of the South African authorities to increase the pace of tariff liberalisation. The WTO offer in 1994 and the subsequent liberalisation - in some cases at faster rates than the WTO commitments - has meant that the tariff protection, which sheltered domestic industry from international competition in the past, has largely diminished. This view is supported by an analysis of ERP calculations during the 1990s. Whether liberalisation should have gone further and faster during the 1990s is a legitimate question with the answer to this question depending on a critical analysis of the liberalisation programme during the 1990s. However, to argue, as was done by Fedderke and Vaze (2001), that more of South Africa's output has been subjected to increased levels of protection during the 1990s is incorrect.

[34] The tariffs collected on products within the SIC 1 category was used in the calculation for the tariff rates. This information was obtained from the DTI. The results are even more pronounced if one considers statutory rates. According to IMF (2000) the statutory average rates decreased from 25 percent in 1990 to 2.2 percent in 1998 (see table 3).

CHAPTER FIVE
TRADE INCENTIVES, TRADE REGIME BIAS AND SOUTH AFRICAN MANUFACTURING PRODUCTION DURING THE 1990s

5.1 Introduction

It is important to draw a distinction between policy incentives and actual trade patterns. It has been shown that in a three-sector framework, the promotion of import substituting (export) production need not be at the expense of export (import substituting) production (Liang, 1992; Pack and Westphal, 1986; Sachs, 1985; Singer and Alizadeh, 1986). This is an important development since it calls into question the conventional measure of anti-export bias, namely, that import substitution occurs at the expense of export production. Hence, the first objective of this chapter is to analyse the impact of export and import-substituting incentives accorded to the South African manufacturing sector during the 1990s within this three-sector framework. The question that informs the analysis in this regard is:

> *"What was the impact of trade incentives on the extent of anti-export bias in South African manufacturing during the 1990s?"*

As far as actual trade patterns are concerned, it is important to realize that import substitution (substitution of domestic production for imports) can occur naturally under free trade conditions (Balassa and Associates, 1982: 49). In addition, imports may decrease because there has been a decline in domestic demand rather than an increase in domestic production. Similarly, an increase in the ratio of exports to domestic production could be as a result of a decrease in production rather than in an increase in the volume of exports produced. It is thus imperative that a critical analysis of any trade policy regime has to distinguish between intended policy incentives and the actual trade patterns that result. This would allow one to ascertain the extent to which actual trade patterns conform to the policy incentives accorded to the industries. This is the second objective of this chapter.

In this chapter the following are undertaken:

- An analysis of the impact of trade incentives on trade regime bias of the South African manufacturing sectors during the 1990s, and
- An analysis of the sectorial orientation of manufacturing production during the 1990s. The main aim here will be to ascertain if the trade patterns experienced by the different industries conformed to the trade incentives accorded to industries.

In the next section a theoretical review of trade incentives and their impact on trade regime bias is provided. Section 5.3 provides an empirical analysis of the bias of the trade regime in South Africa during the 1990s. The penultimate section provides a brief review of manufacturing production in the light of the trade regime bias identified in the previous section. Section 5.5 concludes.

5.3 Trade incentives

The general case for trade strategy as the main determinant of industrial success is based on the assumption that incentives are an important determinant of performance (Lall, 1990:119). However, it is important to recognise that while trade policy is an important element of industrial policy, other important elements include, tax policy, employment policies, competition policies, research and development (R&D), policies influencing technology transfer and growth of domestic markets.[1] The process of industrialisation is to a large extent determined by the interplay between these different elements. Trade incentives that encourage export production, for example, may not be successful if it is not complemented by policies that ensure favourable access to credit (to finance construction of production facilities) and/or policies that promote R&D activity. Technology is an important factor underpinning the gains from trade. (Posner, 1961; Hufbauer, 1966; Vernon, 1966; Krugman, 1979a).

[1] See Krueger (1978) and Bhagwati (1978) and Papageorgiou et al (1990) for an analysis of the effects of macroeconomic policies (e.g. monetary policy, fiscal policy and exchange rate) on the trade policy of selected countries. Rodriguez and Rodrik (1999) go one step further, by arguing that it may be futile to seek a relationship between trade barriers and growth, in the light of the complex inter-relationships between trade policy and other macro-economic or government policies.

Measuring trade incentives has been one of the major challenges confronting the empirical analyst. This is usually due to the non-availability of reliable statistics, which in turn is due to either deficiencies in statistical records or information being deliberately excluded from official statistics. Information could be excluded from official records in order to keep domestic lobby pressures in check and/or to prevent falling foul of WTO rules.

Trade incentives could include direct measures like tariffs, quotas and export subsidies and indirect measures like special tax incentives to promote production (as in the case of export processing zones) and expenditures on R&D and skills development. Information on imports (e.g. tariffs) and import quotas are usually more readily available and these have mainly been used in the appraisal of trade policy. These have usually been incorporated in effective protection analysis.[2] However, if export and import substituting incentives were simultaneously used to stimulate production, then a critical analysis of trade policy has to analyse both sets of incentives. Between 1990 and 1997, both tariff protection and export subsidies (under the General Export Incentive Scheme- GEIS) were given to sectors. Given this scenario, the issue of relevance is what effect these incentives had on bias of the trade regime during the 1990s.

Even if a realistic measure of trade incentives exists or can be derived, it is still necessary to define the criteria determining the trade policy stance. In other words, what are the level of trade incentives that bias the regime towards either export or import competing production? Krueger (1978) defines the overall stance or "bias" of trade policy as the ratio of the internal relative price of exports and imports (internal terms of trade) to the world price ratio (external terms of trade). Expressed mathematically this is given by:

[2] For an application to SA see, IDC (1996a) and Fedderke and Vaze (2001)

$$TB = \frac{\frac{P_x}{P_m}}{\frac{P_x^*}{P_m^*}} \quad \text{.....(4)}$$

where TB reflects the trade bias, P_x and P_m the domestic price of exports and imports and P_x^* and P_m^* world prices of exports and imports. TB will exceed one when the domestic incentive structure promotes exports, while a value less than one favours import-substituting production. The incentive structure is neutral when TB equals 1. Thus, equation (4) provides an indirect measure of the trade incentives accorded to export or import competing production.

Bhagwati (1988a; 1988b) considers export promotion to be a strategy that does not discriminate against exports. In this case, a neutral trade policy stance would qualify as export promotion.[3] Given this classification scheme, an incentive structure that favours imports over exports is construed to have an anti-export bias. The effective exchange rate (EER) is used to depict the bias in the trade regime. In this case, the EER refers to the nominal exchange rate plus any trade incentives per unit of foreign currency received by domestic producers.[4] This can be represented by the following equations:

$$EER_m = e(1 + t_m + q_m) \quad \text{.....(5)}$$

$$EER_x = e(1 - t_x + s_x) \quad \text{.....(6)}$$

Where e, t_m, q_m, s_x represent the exchange rate, the tariff rate, the quota equivalent rate and export subsidy rate respectively. In addition, t_x represents any disincentive (e.g. an export tax) against exports. The trade regime is said to be neutral if EER_x equals EER_m. The EER_x and EER_m can be calculated at

[3] Where the incentive structure is biased towards export promotion, Bhagwati (1988a) classifies this as ultra-export promotion.

[4] This differs from the usual definition of the EER where it represents the trade weighted sum of the currencies of major trading partners.

a disaggregate (industry) level, in which case a comparison between these indices would reflect the trade regime bias at the industry level.

In the 1960s and 1970s, the trade policy debate on economic development centred around protection for import substitution *vis-a-vis* export promoting activities, with the Latin American experience providing fertile ground for this debate. Since the mid-1980s it has become apparent that the main issue surrounding the path to industrialisation has not been one of either export promotion or import substitution, but the inter-relationship between and sequencing of these two strategies. The notion that protection restricts export growth is based on the two-sector (exportables and importables) model where protection of one sector is at the expense of the other sector (Greenaway and Milner, 1987; Clements and Sjaastad, 1984; World Bank, 1987). Within a two-sector model the anti-export bias measure is meant to reflect the effects of trade policy on exports relative to imports. In this case, the anti-export bias measure is given by:

$$AEB = \frac{(1+ERP)}{(1+XPR)} \quad \text{.....(7)}$$

where, AEB = anti export bias

$\frac{VA_d - VA_w}{(VA_w)}$ = effective rate of protection (*ERP*)

$\frac{VA_w - VA_d}{(VA_d)}$ = export protection rate (*XPR*)

VA_d = value added under protection

VA_w = value added under free trade

According to equation (7), if AEB exceeds 1 then there is a bias against export production. Since equation (7) is based on a two-sector framework, any import substituting incentives is at the expense of export production, thus implying an anti-export bias in the trade regime. This can be proven quite easily as follows. If one assumes that for a given sector VA_w equals 10 percent and VA_d equals 20 percent, then ERP totals 100 percent

$[\frac{(20-10)}{10}*100]$ while under the same scenario XPR equals -50 percent $[\frac{(10-20)}{20}*100]$ thus implying an anti export bias since the AEB exceeds unity $[\frac{(1+1)}{(1-0.5)}*100]$.

However, in a three sector model, even with full employment, import-substituting policies can complement export promoting policies as resources are drawn from non-tradables into both the tradables sectors (Sachs, 1985; Singer and Alizadeh, 1986; Pack and Westphal, 1986). Liang (1992) has shown that in a three-sector model (exportables, importables and non-tradeables), export promotion and import substitution need not be mutually exclusive policies. In this case, production of tradeables is a function of two relative prices, that is:

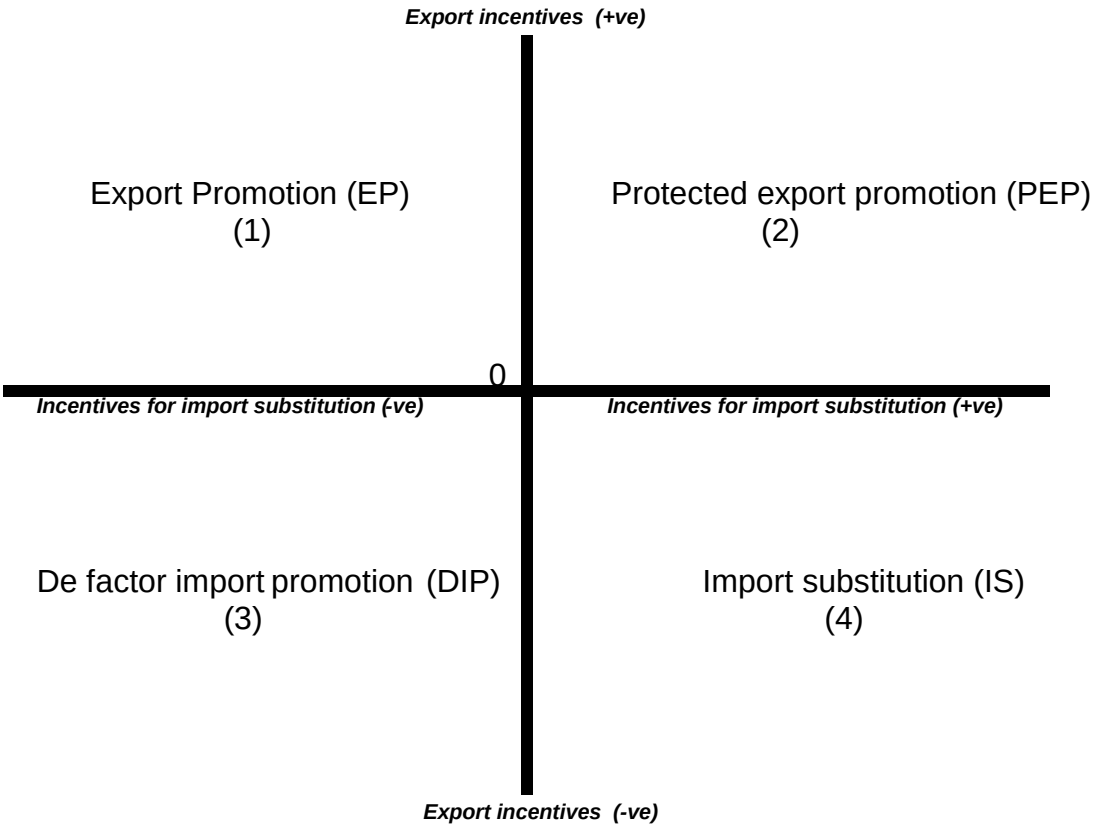
$$X = f(\frac{P_m}{P_n};\frac{P_x}{P_n}) \quad \text{.....(8)}$$

$$M = f(\frac{P_m}{P_n};\frac{P_x}{P_n}) \quad \text{.....(9)}$$

An increase (decrease) in the price of exportables (P_x) results in an increase (decrease) in the production of exportables. However, the increase (decrease) is not necessarily at the expense (advantage) of the import substituting sector. This is because the increase in the production of tradeables (exportables, importables) can be facilitated through a shift of resources from the non-tradeables to the tradeables sector. Using this three-sector framework it is possible to identify five distinct trade incentive patterns as reflected in figure 2.[5]

[5] For a formal elegant exposition see Liang (1992).

Figure 2: Trade incentives and regime bias



Source: LIANG, N. 1992. Beyond import substitution and export promotion: A new typology of trade strategies. *Journal of Development Studies*, Vol. 28, p 452.

- Quandrant 1 reflects a "pure" export promoting strategy (EP) where export incentives are positive and negative protection (disincentives) for import substituting activities.
- In quadrant 2 there are incentives for both export activities and import substituting activities. Liang (1992) terms this "protective export promotion" (PEP). In this case, protection is accorded for the domestic market whilst firms are simultaneously encouraged to export.[6]

[6] This corresponds with South Korea's export experience where incentives for both export and import substituting activities were simultaneously provided. (Pack and Westphal, 1986; Suh, 1975).

- Quadrant 3 depicts a situation where disincentives exist for both exportables and import substitutes. Imports and non-tradables are being favoured.[7]
- Quadrant 4 depicts "import substitution" (IS) where there are incentives for import substitutes and disincentives for exportables.
- A neutral trade policy stance is one where neither exportables nor import substitutes receive any incentives. This is captured at the point of intersection of the two axes.

Thus, within a three-sector framework, free trade is but one of a range of export-fostering policy regimes. The simultaneous protection of both the exportables and importables sector is not incompatible with export promotion. Wade (1990) and Amsden (1989) have argued that the East Asian experience has shown that import protection was necessary to secure export production.[8] The implication of this is that it calls into question the conventional interpretation that a greater incentive to produce for the domestic market is a bias against export production. In terms of figure 2 above, only quadrants 3 and 4 reflect a bias against export. Quadrant 2, although having incentives for import-substitution, does not reflect an anti-export bias since there are incentives for export production. This is the fundamental point that emerges from an analysis within a three sector framework - import substitution need not be at the expense of export promotion.

However, Milner (1995) has illustrated that the simultaneous promotion of exportables and importables may not necessarily produce a pro-tradeable bias. The net effects depend on the nature and magnitude of the substitution, complementarity and income effects of the exportables, importables and non-tradable sectors.[9] In addition, the existence of imperfect competition may result in policy measures not matching production outcomes. Since actual outcomes may differ from policy intentions, Liang's (1992) trade incentive

[7] Liang (1992: 454) only emphasizes the promotion of imports but not the promotion of non-tradables in this quadrant.
[8] Krugman (1994) has shown that under conditions of imperfect competition import protection is not only compatible with, but may also be necessary for export production.
[9] For the proof of this see Milner (1995).

classifications may have limitations as an ex-ante tool of policy formulation. However, it provides a useful tool allowing one to at least measure the bias of the trade regime ex-post.[10]

Following the general equilibrium framework developed by Sjaastad (1980) and Greenaway and Milner (1987), incidence analysis has also been used to analyse the effects of protection. In a three-sector model, "…*an examination of how an import tariff alters the price of importables relative to exportables and non-tradables can provide an indication of the "true" protection of importables and the extent to which the incidence of the tax is shifted onto exportables and non-tradables. The incidence depends essentially on the degree of substitutability (in demand and production) between the products of the importables sector and the other unprotected sectors"* (Greenaway, 1989: 127). The incidence measure is depicted by the variable "w" in the following formula:

$$\log(\frac{P_n}{P_x}) = c + w\log(\frac{P_m}{P_x}) + u \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(10)^{11}$$

where u is the stochastic disturbance term. In this case w estimates the proportion of import protection that is shifted in the form of an implicit export tax. Where importables and non-tradeables are substitutes, w tends towards unity. On the other hand, w tends towards zero if exportables and non-tradeables are substitutes for each other.

Another model which unfortunately has strong data requirements, is the trade restrictive index (TRI) proposed by Anderson and Neary (1996). The TRI uses a CGE model to derive the uniform tariff, which has the same static welfare effect as the structure of tariffs and quotas actually in place. Similiarly, a trade subsidisation index can be constructed to capture the effects of export

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[10] This could have been either intended or unintended. One way of analysing the impact of trade incentives is to consider its effects on prices. This is the focus of chapters six and seven.

[11] For a formal proof see Milner (1995) and Greenaway (1989).

subsidies.[12] The data requirements for the calculation of the trade restrictive index preclude its use in the case of SA. In addition, O'Rouke (1997) has shown that the index is sensitive to changes in the specification of the model and demand elasticities used in the estimation of the model.

5.2 Trade regime bias

As in the case of Balassa and Associates (1982), the effective rate of protection is used to reflect the trade incentives accorded to import substituting activities. This is termed the net effective subsidy rate on imports. The net effective subsidy rate on exports captures the combined effects of protective measures and export incentives on export production. In the calculation of export incentives, due consideration was given to the export subsidies under the General Export Incentive Scheme (GEIS), import rebates (article 470.03) and the tariffs paid on intermediate inputs. Due to data constraints transport rebates, or interest rate concessions that may have been accorded to some industries during the period under analysis were not considered. [13]

Figures 3 and 4 present the trade regime bias for different industries for the period 1990-94 and 1995-97.[14] As in Liang (1992), a cut off point of 5 percent is used to define the free trade region.[15] If an industry's incentive measure is within 5 percentage points from the intersection of the axis, then the industry is defined as following a free trade strategy. The sectors are represented by numbers (see table 8); only those sectors that were not subjected to a free trade strategy are explicitly reflected in figures 3 and 4. All those sectors that are not explicitly reflected in figures 3 and 4 are contained in the free trade region.

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[12] see Anderson and Neary (1996).

[13] For a detailed description of how the trade incentive bias can be measured see Balassa and Associates (1982: Appendix 1).

[14] The GEIS began in 1990 and ended in 1997 and there were no general export incentive scheme available after 1997. Since 1995 represented the beginning of SA's tariff liberalisation programme, the analysis is divided between the two periods 1990-94 and 1995-97.

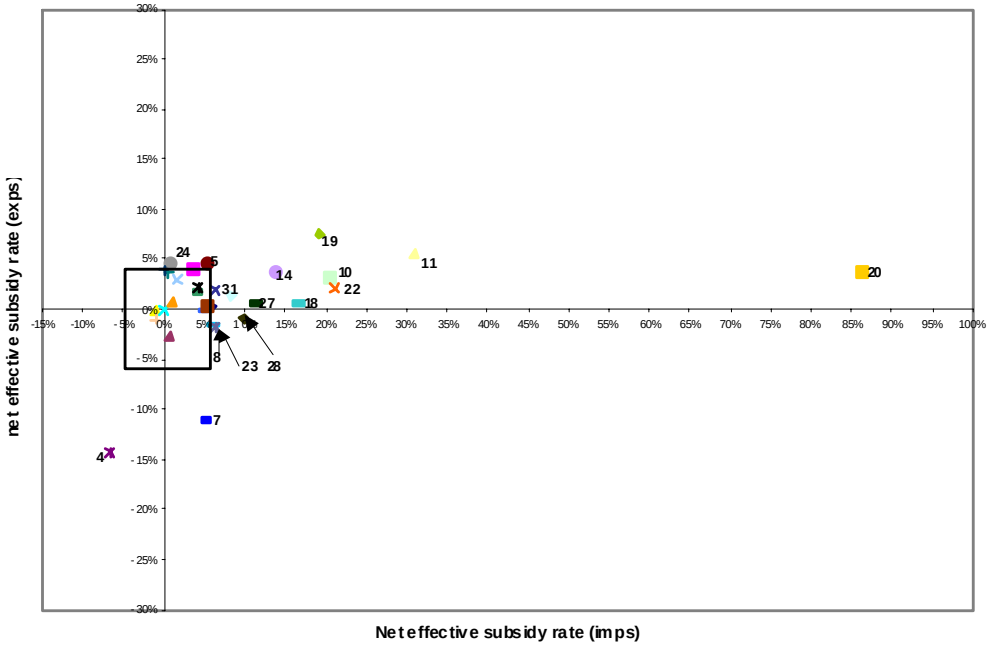
[15] This is a subjective benchmark and as such influences the number of industries that are classified as having a free trade regime bias.

Table 8: Sectors reflected in figures 4 and 5

1	Agriculture, forestry and fIshing	17	Other chem & Man fibres
2	Coal mining	18	Rubber
3	Gold and uranium ore mining	19	Plastic prod
4	Other mining	20	Glass and glass product
5	Food	21	Non metallic minerals
6	Beverages	22	Basic Iron and Steel
7	Tobacco	23	Basic non ferrous met
8	Textiles	24	Metal prod excl machinery
9	Wearing apparel	25	Machinery & Equip
10	Leather	26	Electrical machinery
11	Footwear	27	TV radio and equip
12	Wood and wood prod	28	Professional and scientific
13	Paper and Paper Prod	29	Motor vehicles Parts
14	Print, pub and recording	30	Other transport
15	Coke and ref petrol	31	Furniture
16	Basic Chemicals	32	Other industries

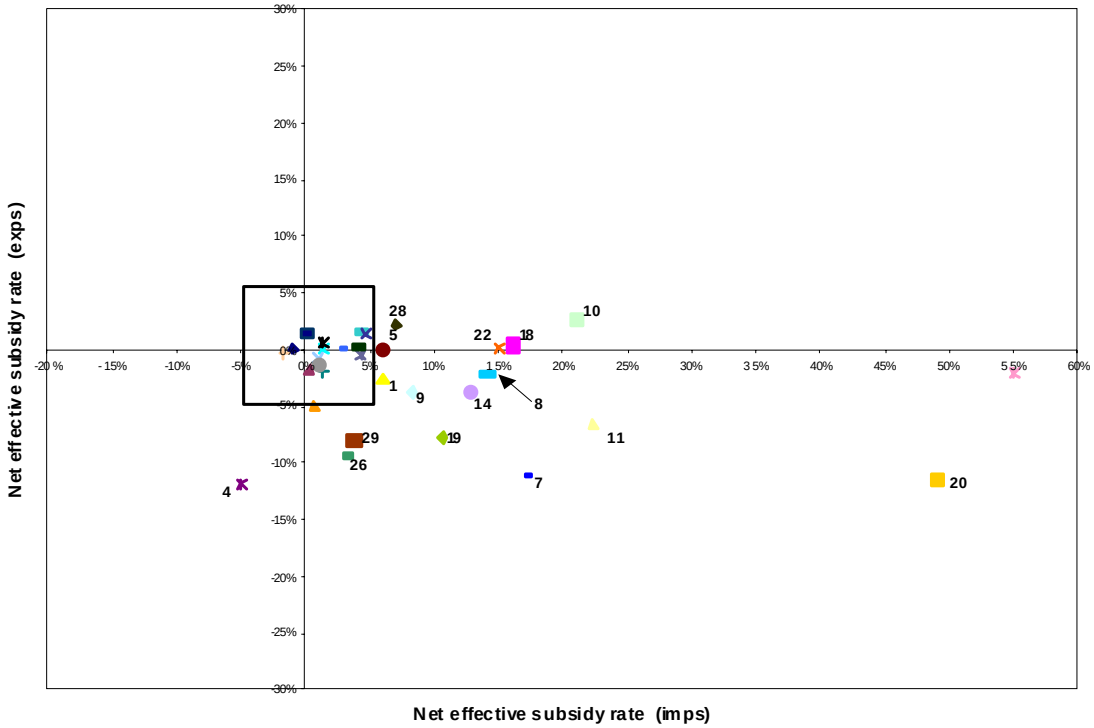
Source: Own tabulation

Figure 3: Trade incentive classification (1990-94)



Source: Own calculations with data from the Department of Trade and Industry.

Figure 4: Trade incentive classification (1995-97)



Source: Own calculations with data from the Department of Trade and Industry.

During both periods, there were sixteen sectors that fell outside the free trade region. For the period 1990-94, eleven sectors (metal products; food; furniture; TV, radio and communication; printing and publishing; plastic products; rubber products; leather and leather products; basic iron and steel; footwear; glass and glass products) enjoyed both export promotion and import substituting incentives. In terms of the classification used by Liang (1992), these eleven industries were subjected to a "protected export promotion" (PEP) incentive structure.[16] Four sectors (textiles; basic non ferrous metals; professional scientific equipment; tobacco) were given incentives (disincentives) for import substitution (export production); this is classified as an import-substituting trade strategy. There were disincentives for both export production and import substituting activities for the "other mining" sector - this is classified as "duly import promotion" (DIP) - this is not surprising since

[16] This is not surprising given that both export subsidies and tariff protection were the two main trade policy instruments during this period.

"other mining" mainly includes oil imports. Thus, during the period 1990-94, only five sectors (textiles; basic non ferrous metals; professional scientific equipment; tobacco and other mining) had a trade policy bias against exports.

During the period 1995-97, export incentives (GEIS) were being phased out and it is thus not surprising that only five sectors (professional and scientific equipment; food; basic iron and steel; rubber products; leather and leather products) enjoyed "protected export promotion". There was an increase in the number of sectors with an import-substituting trade policy bias. This included the following industries; electric machinery and apparatus; motor vehicles and parts; agriculture; wearing apparel; plastic products; printing and publishing; textiles; tobacco; footwear; glass and glass products. Imports were still being encouraged for the "other mining" sector during this period.

Comparing the two periods, the following emerges:

- Of the 12 sectors that are common in both periods, the incentive scheme is unchanged for four "PEP" sectors (food; leather and leather products; rubber products; basic iron and steel), one "DIP" sector (other mining) and two import-substituting sectors (tobacco; textiles). Of the remaining sectors, four (footwear; printing and publishing; plastic products; glass and glass products) moved from enjoying both export and import substituting incentives during 1990-94 ("protected export promotion") to a situation where they were accorded only incentives for import substitution and disincentives for export production ("import-substitution"). The professional and scientific equipment sector moved from a situation of only having incentives (disincentives) for import substitution (export promotion) during 1990-94 to enjoying incentives for both export and import substituting activities during 1995-97.
- Four sectors (basic non-ferrous metals; metal products excluding machinery; TV, radio and communication; furniture) moved from enjoying some level of incentives for import substitution (e.g. basic non-ferrous metals) and some level of incentives for both export and import substituting activities (e.g. metal products excluding machinery;

TV, radio and communication; furniture) during the period 1990-94 to a free trade regime bias during 1995-97. In addition four sectors (agriculture; wearing apparel; electrical machinery; motor vehicle and parts) moved from a free trade regime bias during 1990-94 to an import-substituting bias during 1995-97.

- There was an increase in the number of sectors subjected to an import-substituting trade regime bias from four (1990-94) to ten (1995-97). In essence, it is these 10 sectors together with the other mining sector (4) that had an anti-export trade policy bias during the period 1995-97.

The significance of the last point should not be over-estimated. It has been claimed that South Africa's trade policy has been characterised by a high level of anti-export bias (IDC, 1996a; Tsikata, 1999). In terms of the calculations undertaken within the two-sector framework, by the IDC (1996a), the sectors subjected to an anti-export trade policy bias accounted for 80 percent (87 percent) of total output in 1990 (1999).[17] However, in terms of classifications reflected in figures 3 and 4, the sectors subjected to an anti-export bias accounted for 13 percent (27 percent) of total output in 1990 (1999).[18] Thus, while the anti-export bias in trade policy increased during the latter part of the 1990s with the phasing out of export incentives, the extent of anti-export bias prevailing during the early to mid 1990s has been exaggerated.[19]

5.4 Sectorial orientation of manufacturing production

The objective in the remainder of this chapter is to ascertain how the production of the different sectors related to the trade policy bias identified in the previous section. Considering first the classification of sectors according to their production structure. The classification of export and import sectors is not as straightforward as might be first assumed. Sectors could be producing more than one product (sometimes referred to as multi-product sectors) with

[17] The anti-export bias calculations for 1993 were used to determine the contribution for the year 1990.
[18] The sectoral classification identified in figure 3 (figure 4) were used to determine the sectoral output in 1990 (1999). The data used in the calculations was sourced from TIPS.
[19] See Belli et al (1993), World Bank (1994), Tsikata (1999).

some products specifically targeted for the domestic market while others may be targeted for the international market. In addition, the economic literature has shown that, *inter-alia*, product differentiation and transport costs could result in intra-industry trade. Hence, the issue to bear in mind is that even if the policy objective is to target export sectors, it may not be always easy and straightforward to identify export industries.

Trade theory suggests that factor intensities could be used to classify sectors - the conventional wisdom being that export sectors would conform to factor endowments.[20] However, the *Leontief paradox* and new trade theory has called into question the notion that comparative advantage is based solely on factor endowments. Actual trade patterns (for example, net trade balances) could also be used to classify sectors (Milner and McKay, 1996).[21] Alternatively, the classification could be based on import and export shares (Balassa and Associates, 1982). In this case, the following four categories could be identified:

- Export industries (EP): industries where more than 10 percent of domestic production is exported but imports account for less than 10 percent of domestic consumption.
- Import-competing industries (IC): where less than 10 percent of domestic production is exported but imports account for more than 10 percent of domestic consumption.
- Export and import-competing industries (E, I): where exports and imports account for more than 10 percent of domestic production and consumption respectively.
- Non-tradables (NT): industries where exports and imports account for less than 10 percent of domestic production and consumption respectively.

[20] In some respects the measure captures the potential of the industry based on its factor content. However, it could be the case that the industry's existence could be due to protection in which case an ex-post protection classification would not necessarily imply a similar factor use as would be the case without protection.

[21] Another alternative would be to use revealed comparative advantage calculations in the classification of sectors. However, the classification would not differ significantly from those using net exports.

The above classification, while sensitive to the benchmark (which is chosen arbitrarily) relates very closely to the definitions of import substitution and export promotion used in the empirical literature. Based on the criteria mentioned above, table 9 reflects the classification for the sectors of the South African economy.

Table 9: Classification of sectors (export promoting, import substituting, non-tradables)

Sectors (SIC)	Exports/production		Imports/consumption		Classification	
	1990-94	1995-2001	1990-94	1995-2001	1990-94	1995-2001
Agriculture, forestry and fishing [1]	13	15	7	7	E	E
Coal mining [21]	43	45	2	4	E	E
Gold and uranium ore mining [23]	99	99	0	0	E	E
Other mining [22/24/25/29]	94	75	91	65	E,I	E,I
Food [301-304]	8	10	5	10	NT	E,I
Beverages [305]	4	11	3	5	NT	E
Tobacco [306]	3	11	2	2	NT	E
Textiles [311-312]	12	16	20	26	E,I	E,I
Wearing apparel [313-315]	6	10	7	12	NT	E,I
Leather and leather products [316]	20	36	23	31	E,I	E,I
Footwear [317]	2	4	11	31	IC	IC
Wood and wood products [321-322]	9	13	10	12	IC	E,I
Paper and paper products [323]	17	23	11	14	E,I	E,I
Printing, publishing and recorded media [324-326]	1	2	16	20	IC	IC
Coke and refined petroleum products [331-333]	15	21	7	12	E	E,I
Basic chemicals [334]	29	44	39	48	E,I	E,I
Other chemicals and man-made fibers [335-336]	4	13	18	28	IC	E,I
Rubber products [337]	6	18	17	30	IC	E,I
Plastic products [338]	2	6	8	12	NT	IC
Glass and glass products [341]	9	14	15	24	IC	E,I
Non-metallic minerals [342]	4	8	8	16	NT	IC
Basic iron and steel [351]	44	52	9	13	E	E,I
Basic non-ferrous metals [352]	54	59	20	34	E,I	E,I
Metal products excluding machinery [353-355]	7	14	9	13	NT	E,I
Machinery and equipment [356-359]	12	45	49	72	E,I	E,I
Electrical machinery and apparatus [361-366]	5	14	25	33	IC	E,I
Television, radio and communication equipment [371-3]	6	30	44	79	IC	E,I
Professional and scientific equipment [374-376]	23	62	76	89	E,I	E,I
Motor vehicles, parts and accessories [381-383]	8	15	26	33	IC	E,I
Other transport equipment [384-387]	15	66	51	82	E,I	E,I
Furniture [391]	7	35	3	11	NT	E,I
Other manufacturing [392-393]	27	40	44	55	E,I	E,I
Electricity, gas and steam [41]	1	1	0	0	NT	NT
Water supply [42]	0	0	0	0	NT	NT
Building construction [51]	0	0	0	0	NT	NT
Civil engineering and other construction [52-53]	0	0	0	1	NT	NT
Wholesale and retail trade [61-63]	4	5	0	0	NT	NT
Catering and accommodation services [64]	10	12	10	12	E,I	E,I
Transport and storage [71-74]	10	12	8	9	E	E
Communication [75]	5	4	6	5	NT	NT
Finance and insurance [81-82]	3	5	2	2	NT	NT
Business services [83-88]	2	2	2	2	NT	NT
Medical, dental and veterinary services [93]	1	1	1	1	NT	NT
Services excl medical, dental and vet services [94-96]	2	2	4	3	NT	NT
Other producers [98]	1	1	7	8	NT	NT
General government services [99]	0	0	0	0	NT	NT

Source: Own calculations with data from TIPS

During the pre-liberalisation period, the production of six (nine) sectors was solely oriented towards export (import competing) production. The export sectors were made up of three primary commodity sectors (namely, agriculture, forestry and fishing; coal mining; gold and uranium ore mining), two manufacturing sectors (namely, coke and refined petroleum and basic iron and steel) and one service sector (namely, transport and storage industries). The import substituting industries were all from the manufacturing sector and included footwear; wood and wood product; printing and publishing; other chemicals, rubber products; glass and glass products; electrical machinery; TV, radio and communication and motor vehicle parts and accessories industries.

The production of eight manufacturing industries (food; beverages; tobacco; wearing apparel; plastic products, non-metallic minerals; metal products and furniture) oriented their production mainly to the domestic market during this period. All the other manufacturing sectors were engaged in both export and import competing production.

It is evident from the data that the trade exposure of South African manufacturing industries increased significantly during the latter part of the 1990s. The number of industries that were subjected to both import competing and export production increased from 11 (1990-94) to 24 (1995-2000) implying that these industries had to compete with international production in both the domestic and international markets. The basic result gleaned from table 9 is that domestic producers were not insulated from international competition. However, the question is whether these developments were in response to trade policy measures implemented during this period. The next section aims to explore this aspect more closely.

5.4.1 Trade incentives and the production of manufacturing sectors during the 1990s

Following Chenery (1979), changes in gross production can be allocated across the demand factors of domestic demand, export expansion and import substitution as follows:

$$\Delta Q = \Delta DD + \Delta EE + \Delta IS \quad \text{.....(11)}$$

where: Q = gross value of output

DD = domestic demand

EE = export expansion

IS = import substitution

Equation (11) is calculated as follows:

$$\frac{(Q_t - Q_{t-1})}{(Q_t - Q_{t-1})} = \frac{(1 - m_{t-1})(DD_t - DD_{t-1})}{(Q_t - Q_{t-1})} + \frac{(E_t - E_{t-1})}{(Q_t - Q_{t-1})} + \frac{(m_t - m_{t-1})(DD_t)}{(Q_t - Q_{t-1})} \quad \text{.....(12)}$$

where m_t, Q_t, E_t represents the import coefficient (defined as the share of imports in the domestic demand), output and exports in year *t*, respectively.

The first term on the right hand side is the contribution of domestic demand to the growth of gross output. The second term captures the effect of export expansion. The third term reflects the change in the import coefficient for a given level of domestic demand; a positive sign indicates that import substitution has taken place while a negative sign means that foreign goods have gained market share.

Equation 12 is used to calculate the source of growth for the different sectors during the period under analysis - the information is reflected in table 10. In addition, for ease of reference, the information from figures 3 and 4 is also reproduced in table 10. The efficacy of trade policy could be determined by ascertaining whether changes in the structure of production correlate with the trade regime bias.[22]

[22] One would, for example, expect that an import-substituting bias in the trade regime would promote import-substituting industrialisation in that sector.

Table 10: Trade regime bias, production bias and source of growth

		1990-1994				1995-1997						
			Sources of growth				Sources of growth			Sources of growth		
	Sector (SIC)	TRB[1]	DD	EE	IS	TRB[1]	DD	EE	IS	DD	EE	IS
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
1	Agriculture, forestry and fIChing [1]		1.78	0.23	-1.01	IS	1.35	-0.10	-0.25	0.67	0.54	-0.21
2	Coal mining [21]		0.55	0.46	-0.01		0.52	0.52	-0.04	-0.37	1.48	-0.11
3	Gold and uranium ore mining [23]		0.00	1.00	0.00		0.00	1.00	0.00	0.00	1.00	0.00
4	Other mining [22/24/25/29]	DIP	-0.05	0.68	0.37	DIP	0.53	0.19	0.29	0.26	0.63	0.11
5	Food [301-304]	PEP	0.98	0.06	-0.04	PEP	0.98	0.13	-0.11	0.86	0.18	-0.04
6	Beverages [305]		0.56	0.53	-0.09		0.80	0.29	-0.09	1.11	-0.04	-0.07
7	Tobacco [306]	IS	0.89	0.11	0.00	IS	0.55	0.48	-0.03	0.61	0.44	-0.04
8	Textiles [311-312]	IS	0.99	0.07	-0.07	IS	0.67	0.44	-0.11	0.98	0.06	-0.03
9	Wearing apparel [313-315]		0.79	0.30	-0.08	IS	0.77	-0.05	0.28	0.43	0.24	0.33
10	Leather and leather products [316]	PEP	0.62	0.73	-0.35	PEP	0.57	0.56	-0.13	0.86	0.20	-0.06
11	Footwear [317]	PEP	0.76	-0.12	0.36	IS	0.87	-0.12	0.25	0.17	-0.06	0.88
12	Wood and wood products [321-322]		0.92	0.16	-0.08		0.92	0.08	0.00	1.39	-0.35	-0.05
13	Paper and paper products [323]		0.97	0.14	-0.11		-1.42	2.46	-0.04	-0.25	1.27	-0.02
14	Printing, publIChing and recorded media [324-326]	PEP	0.98	0.02	0.00	IS	1.12	0.03	-0.15	1.10	0.14	-0.24
15	Coke and refined petroleum products [331-333]		0.88	0.09	0.03		0.74	0.43	-0.16	-0.24	1.00	0.24
16	Basic chemicals [334]		1.06	-0.24	0.18		0.48	0.52	0.00	0.59	0.41	0.00
17	Other chemicals and man-made fibers [335-336]		0.99	0.10	-0.09		0.95	0.24	-0.18	1.01	0.38	-0.39
18	Rubber products [337]	PEP	1.01	-0.03	0.03	PEP	0.85	0.85	-0.70	0.65	1.21	-0.86
19	Plastic products [338]	PEP	0.98	0.05	-0.03	IS	0.96	0.17	-0.13	1.19	0.42	-0.61
20	Glass and glass products [341]	PEP	0.99	0.10	-0.09	IS	0.05	-0.87	1.82	0.67	-0.59	0.93
21	Non-metallic minerals [342]		0.94	0.21	-0.16		1.00	0.10	-0.10	1.14	0.50	-0.64
22	Basic iron and steel [351]	PEP	0.37	0.63	0.00	PEP	0.43	0.66	-0.09	0.63	0.40	-0.02
23	Basic non-ferrous metals [352]	IS	1.63	0.07	-0.70		0.64	0.39	-0.04	-0.12	1.41	-0.29
24	Metal products excluding machinery [353-355]	PEP	0.90	0.12	-0.02		0.82	0.22	-0.04	-0.01	0.41	0.60
25	Machinery and equipment [356-359]		1.65	0.52	-1.17		0.80	0.67	-0.48	-0.14	-0.65	1.79
26	Electrical machinery and apparatus [361-366]		1.01	0.16	-0.17	IS	0.25	0.37	0.38	0.23	-0.12	0.89
27	Television, radio and communication equipment [371-3	PEP	4.85	0.64	-4.49		-0.53	-0.60	2.14	0.52	0.91	-0.43
28	Professional and scientific equipment [374-376]	IS	0.76	0.38	-0.14	PEP	1.16	1.67	-1.83	0.62	0.94	-0.57
29	Motor vehicles, parts and accessories [381-383]		0.55	0.29	0.16	IS	-0.02	0.85	0.17	0.35	-0.26	0.91
30	Other transport equipment [384-387]		1.82	0.96	-1.77		-0.82	0.78	1.04	-4.85	5.30	0.56
31	Furniture [391]	PEP	1.03	-0.69	0.67		0.39	0.70	-0.09	-0.04	1.36	-0.32
32	Other manufacturing [392-393]		1.59	2.12	-2.71		0.44	0.55	0.01	0.96	1.58	-1.54
33	Electricity, gas and steam [41]		0.99	0.01	0.00		0.99	0.01	0.00	1.01	-0.01	0.00
34	Water supply [42]		1.00	0.00	0.00		1.00	0.00	0.00	1.00	0.00	0.00
35	Building construction [51]		1.00	0.00	0.00		1.00	0.00	0.00	1.00	0.00	0.00
36	Civil engineering and other construction [52-53]		1.00	0.00	0.00		1.01	0.00	-0.01	1.00	0.00	0.00
37	Wholesale and retail trade [61-63]		0.97	0.03	0.00		0.90	0.10	0.00	0.91	0.09	0.00
38	Catering and accommodation services [64]		0.92	0.11	-0.02		0.88	0.15	-0.03	0.87	0.16	-0.04
39	Transport and storage [71-74]		0.90	0.10	0.01		0.87	0.16	-0.03	0.87	0.14	-0.01
40	Communication [75]		0.94	0.03	0.02		0.94	0.03	0.02	0.95	0.05	0.00
41	Finance and insurance [81-82]		0.97	0.03	0.00		0.92	0.08	-0.01	0.93	0.07	0.00
42	Business services [83-88]		0.98	0.01	0.01		0.98	0.03	0.00	0.97	0.03	0.00
43	Medical, dental and veterinary services [93]		0.99	0.00	0.01		0.99	0.01	0.00	0.99	0.01	0.00
44	Excluding medical, dental and veterinary services [94-96]		0.97	0.01	0.02		1.01	-0.03	0.02	0.99	0.00	0.01
45	Other producers [98]		1.04	0.02	-0.06		1.01	0.01	-0.02	0.99	0.02	-0.01
46	General government services [99]		N/A	N/A	N/A		N/A	N/A	N/A	N/A	N/A	N/A

1. Trade regime bias. No entry in this column implies that there is no bias in the trade regime (i.e free trade stance).
2. This reflects the bias in the production structure

Source: Own calculations with data from TIPS

Table 10 captures the bias in the trade regime (columns 3 and 7) and the sources of sectoral growth (columns 4, 5, 6, 8, 9, 10, 11, 12, and 13) for the

different sub-periods under analysis.[23] From column 3 and 7 it is evident that there were 16 sectors that had some bias in their trade regime.[24] Since we are interested in ascertaining whether production conformed to the trade incentive structure, the analysis shall focus mainly on these 16 sectors.

Firstly, considering the period 1990-94. Four sectors (tobacco, textiles, basic non ferrous metals and professional and scientific equipment) had an import substituting trade incentive bias. However, the growth in all of these sectors was due solely to domestic demand and export production.[25] There were eleven sectors enjoying incentives for both export and import-substituting activities (classified as PEP in column 3); none of these sectors' growth was due to *both* import-substitution and export production. Domestic demand and export production provided the impetus to growth for eight (food; leather and leather products; printing, publishing and recording media; plastic products; glass and glass products; basic iron and steel; metal products excluding machinery and television, radio and communication equipment) of these sectors.[26] For the remaining three sectors (footwear; rubber products and furniture) growth was underpinned by domestic demand and imports. For the other mining sector, despite there being a disincentive for both import substitution and export promotion (i.e. being subjected to a DIP strategy), both import-substitution and export production were the main sources of growth during this period.

Considering the period 1995-97 a similar picture emerges. There were 10 sectors subjected to an import-substituting trade strategy during this period. Of these sectors, five sectors (namely, agriculture; tobacco; textiles; printing, publishing and recording media and plastic products) had been subjected to

[23] Three periods are considered, namely 1990-94 (pre-tariff liberalisation period with the prevalence of export incentives and tariff protection); 1995-97 (liberalisation period with the existence of export incentives and tariff reductions) and 1995-2001 (period during which the WTO was implemented and includes the period after 1997 when GEIS was suspended).

[24] These sectors were identified in figures 3 and 4.

[25] In fact, the textiles, basic non-ferrous metals and professional and scientific equipment sub sectors all experienced an increase in imports during this period. This is depicted by negative values under column 6 in table 10.

[26] In fact for the majority of these sectors, there was an increase in imports during this period.

rising import levels despite there being an incentive for import-substitution. However, probably of greater significance is that with the exception of the agricultural sector, all the other sectors (tobacco; textiles; printing, publishing and recording media and plastic products) also experienced rising export production during this period. The impetus to growth in the five sectors (food; leather and leather products; rubber products; basic iron and steel and professional and scientific equipment) that were subjected to a PEP trade strategy all came from domestic demand and export production; of interest however, is that all these sectors were not insulated from imports. Even in the case of the other mining sector, export production and import-substitution occurred despite a disincentive for export production (import-substitution).

An analysis of the sources of growth over the period 1990-94 and 1995-97 reveals that the change in the structure of production did not conform to the bias in the incentive structure. This suggests that conditions of imperfect competition may have characterised the economic environment during the 1990s.

As pointed out in chapter four, South Africa embarked on an extensive tariff liberalisation programme after 1995. With tariff liberalisation there is an expectation that imports would have increased. Imports have indeed increased during 1990s; this is born out in table 10 (columns 6, 10 and 13) and table 9 (columns 2 and 3).[27] However, the extent to which this could be attributed to tariff liberalisation should be subjected to more rigorous analysis. This aspect will be explored in greater detail in chapter 8.

5.5 Concluding remarks

In this chapter the incentives accorded to manufacturing production during the 1990s have been considered. The analysis has shown that:

- The conventional measure of anti-export bias has been called into question. Working within a three-sector framework, it was found that

[27] This is borne out be negative values in the respective columns in table 10.

South Africa's trade policy bias against exports has been exaggerated in the economic literature.

- The nature of the change in production does not match or correspond to the allocation of trade incentives given during the 1990s. This is particularly the case for the latter part of the 1990s where export production continued despite the prevalence of import substituting incentives. This suggests that the South African economy may be characterised by conditions of imperfect competition.

The latter point is important since under conditions of imperfect competition, the anticipated price effects of liberalisation may not materialise. The next chapter provides a more detailed analysis of this aspect.

CHAPTER SIX
TARIFF LIBERALISATION, COMPETITIVENESS AND THE REAL EXCHANGE RATE (RER)[1]

6.1 Introduction

In this chapter, a test of the hypothesis that tariff liberalisation has led to increased competitiveness, is provided. One way of assessing the effects of trade liberalisation is to consider its impact on the domestic prices for importables and exportables (Dijkstra, 1997: 8). This chapter uses real exchange rate (RER) calculations based on the relative prices of tradables (exportables and importables) to non-tradables to analyse the impact of tariff liberalisation on competitiveness during the 1990s.

Section 6.2 gives an overview of some of the theoretical issues relating to the RER. This is followed by section 6.3, which undertakes the RER calculations and tests the hypothesis that tariff liberalisation has led to increased competitiveness during the 1990s. Finally, some conclusions are drawn in the last section.

6.2 Some theoretical considerations: The effect of trade liberalisation on the RER.

The RER provides an indication of the competitiveness and profitability of producing tradeable goods. However, there are different definitions of the real exchange rate, which have led to some confusion in the use of RERs in empirical analysis.[2] The purchasing power parity definition of the real exchange rate considers relative prices (domestic and international prices) multiplied by the exchange rate. This is given by:

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[1] I am grateful to an anonymous referee at the *South African Journal of Economic and Management Sciences* for valuable suggestions and comments on a version of this chapter.

[2] See Edwards (1989) for a discussion of the ambiguities related to the different definitions of the RER.

$$RER_1 = e\frac{P*}{P} \quad \text{.....(13)}$$

where e, P, P^* refers to the exchange rate, domestic prices and foreign prices respectively. As Holden (1988: 1-2) points out when consumer price indices (CPIs) are used as price measures, the RER captures the relative price of the baskets of consumption goods in the two countries. Similarly, when producer price indices (PPIs) or gross domestic product (GDP) deflators are used, the relative price of a basket of production goods is measured. In terms of equation (13) a country's competitiveness increases (decreases) if the relative price of domestic tradable goods decreases (increases). Developments in the RER in South Africa have attracted attention in the economic literature (Holden, 1988; Kahn, 1998; Walters and de Beer, 1999; Golub, 2000; Edwards and Schoer, 2000). These studies have considered different measures of the RER and in the main have argued that there was an improvement in South Africa's competitiveness.[3] However, none of these studies have explicitly analysed the effects of trade (tariff) liberalisation on the RER competitiveness indicator.

The RER measured as the ratio of the internal relative price of tradables (P_t) to the price of non-tradables (P_n), is probably the most popular analytical definition of competitiveness (Edwards, 1992: 7). This definition emanated from the dependent economy model where the economy consisted of two sectors, namely tradables and non-tradables (Corden, 1985; Frenkel and Mussa, 1984; Frenkel and Razin, 1987).[4] In this case the RER is given by:

$$RER_2 = \frac{P_t}{P_n} \quad \text{.....(14)}$$

where P_t and P_n refer to the price of tradables and non-tradables respectively.

[3] The evidence suggests that indicators based on real effective exchange rate calculations have overstated the extent of the improvement in South Africa's competitiveness. These studies have in the main emphasized the different theoretical and measurement issues pertaining to the calculation of the RER.

[4] Tradables are classified as those goods whose prices are determined on the world market; they include both exportables and importables. Non-trabables on, the other hand, are classified as those goods whose prices are determined domestically.

An increase (decrease) in RER_2 implies that the opportunity cost of producing tradables, measured in terms of foregone output of non-tradables has decreased (increased). This, in effect, means that the production of tradables is encouraged (discouraged). Stated differently, an increase (decrease) in RER_2 depicts a decline (improvement) in competitiveness. Viewed in this way, RER changes reflect changes in the internal competitiveness of tradable goods *vis-à-vis* non-tradable goods.

Aggregating exportables and importables into a single category implies that relative prices remain unchanged (Holden, 1988). However, the impact of trade liberalisation is not uniform across import and export prices. Liberalisation does not move the prices of exports and imports in the same direction, nor at the same pace. Thus, the use of a composite tradable price index in the calculation of the RER may not accurately indicate movements in competitiveness during periods of trade liberalisation. Some of the important aspects in this regard are briefly outlined and the reader is referred to Milner and McKay (1996) for a more elaborate exposition.[5]

If the price of tradeables is a geometric average of the price of exportables (P_x) and importables (P_m), that is:

$$P_t = P_m^{\beta} P_x^{(1-\beta)} \quad \text{.....(15)}$$

where β refer to the share of importables in tradables.

Substituting (15) into equation (14) and considering the proportionate change in the variables gives:

$$\hat{RER}_2 = \beta \hat{P}_m + (1-\beta)\hat{P}_x - \hat{P}_n \quad \text{..... (16)}$$

[5] Milner and Mckay (1996) provide an elegant theoretical justification for the use of disaggregated tradable (i.e. exportables and importables) price indices in the calculation of the RER. They use the RER calculations to date the liberalisation episode in Mauritius. However, in this paper the RER calculations are used to analyse the impact of trade (tariff) liberalisation on competitiveness.

where $\hat{P}_m$, $\hat{P}_x$ and $\hat{P}_n$ refer to the proportionate change in the price of importables, exportables and non-tradables respectively.

Further, if it is assumed that the domestic price for exportables and importables is equal to the corresponding foreign prices multiplied by $e(1+t)$ and constant foreign prices $(\hat{P}^* = 0)$ then, equation (16) can be expressed as:

$$R\hat{E}R_2 = \hat{e} + \beta\, dt_m + (1-\beta)\, dt_x - \hat{P}_n \quad \text{.....(17)}$$

where *e* = exchange rate; *t* = trade measure; $dt_i = (1\hat{+}t_i)$; *i=x,m*

For simplicity if it is assumed a fixed exchange rate ($\hat{e} = 0$) and exogenously determined non-tradeables prices ($\hat{P}_n = 0$), then import liberalisation $(dt_m < 0)$ would mean that in terms of equation (17), there is a real depreciation $(RER_2 < 0)$. If the price of non-tradeables is endogenously determined - say a positive relationship between P_n and the price of tradeables (ie. $\hat{P}_n > 0$ when $dt_m > 0$) - then with import liberalisation $(dt_m < 0)$, $RER_2 > 0$ when $\left|\hat{P}_n\right| > \beta dt_m$ and $RER_2 < 0$ when $\left|\hat{P}_n\right| < \beta dt_m$. Thus, the impact of trade liberalisation on RER_2 is ambiguous and depends on the change in the price of non-tradables (Milner and McKay, 1996: 78). The relationship between non-tradable and tradable goods' prices has an important bearing on the definition of the RER. It is important to recognise that income and substitution effects emanating from tariff liberalisation could also influence the price of non-tradables. To restore equilibrium in the economy, the proportionate change in the price of non-tradables ($\hat{P}_n$) is given by:

$$\hat{P}_n = w_m \hat{P}_m + w_x \hat{P}_x + u\hat{y} \quad \text{.....(18)}$$

where $w_i = \dfrac{\eta_{ni} - \varepsilon_{ni}}{\varepsilon_{nn} - \eta_{nn}}$

$$\mu = \frac{\eta_n^y}{\varepsilon_{nn} - \eta_{nn}}$$

η_{ni} and ε_{ni} are the elasticities of demand and supply for non-tradables with respect to the price of i $(i = m, x)$. η_n^y represents the income elasticity of demand for non-tradables.

The first two terms on the right hand side reflect the substitution effects while the last term captures the income effects.[6]

Assuming homogeneity of degree zero in prices implies that $w_i > 0$ and the sum of w_i is unity. Equation (18) can thus be rewritten as follows:

$$\hat{P}_n = w_m \hat{P}_m + (1 - w_m)\hat{P}_x + u\hat{y} \quad \text{.....(19)}$$

Substituting (19) into (17) and for simplicity assuming no income effects $(\hat{y} = 0)$ gives:

$$R\hat{E}R_2 = \hat{e} + \beta\, dt_m + (1 - \beta)\, dt_x - w_m \hat{P}_m + (w_m - 1)\hat{P}_x \quad \text{.....(20)}$$

This translates into:

$$R\hat{E}R_2 = \hat{e} + (\beta - w_m)\, dt_m + (w_m - \beta)\, dt_x \quad \text{.....(21)}$$

with $\hat{P}_m = dt_m$; $\hat{P}_x = dt_x$

Further, if it is assumed that an exchange rate adjustment is equivalent to a uniform tariff on imports (e_m) and a subsidy on exports (e_x) then the exchange rate effects could be represented as:

$$\hat{e} = dt_m e_m + dt_x e_x \quad \text{.....(22)}$$

substituting (22) into equation (21) gives:

$$R\hat{E}R_2 = (\beta - w_m)(dt_m + e_m) + (w_m - \beta)(dt_x + e_x) \quad \text{.....(23)}$$

In summary the effects would be as follows:

- With no change in trade policy, exchange rate effects are neutral.
- Trade liberalisation $(dt_m < 0; dt_x > 0)$ accompanied by an exchange rate depreciation $(e_x > 0; e_m > 0)$ would cause the price of exportables to

[6] See Milner and McKay (1996) for a more elaborate exposition of these concepts.

increase (since $dt_x > 0; e_x > 0$) but the movement in the price of importables is uncertain (since $dt_m < 0; e_m > 0$) i.e. import liberalisation causes the prices of imports to decrease whilst the exchange rate depreciation causes importable prices to increase.[7] In addition, the substitution effects (w_m) are important since they also influence the movement in the price of both exportables and importables.

There are a number of factors influencing the price of tradables and non-tradables. The theoretical analysis presented above has considered four factors, namely, trade policy changes, exchange rate changes, substitution and income effects. The analysis has shown that under certain conditions trade liberalisation could have ambiguous effects on the price of importables. It is for this reason, that if the intention is to analyse the likely effects of trade liberalisation, then the RER measure should distinguish between the exportables and importables sectors (Milner and McKay, 1996: 79). Defining the RER in terms of the price of exportables (P_x) and importables (P_m) and replacing (P_t) by (P_x) and (P_m) in equation (14) gives two definitions of the RER namely[8]:

$$RER_{2a} = \frac{P_x}{P_n} \quad \text{.....(24)}$$

$$RER_{2b} = \frac{P_m}{P_n} \quad \text{.....(25)}$$

Since this study is primarily concerned with the effects of tariff liberalisation during the 1990s, the effects of liberalisation on the two RER measures reflected in equations (24) and (25) are considered. With tariff liberalisation (and no change in the exchange rate), it can be expected that both $\hat{RER}_{2a}$ and $\hat{RER}_{2b}$ would depreciate (i.e. be <0); the depreciation in RER_{2a} probably being

[7] Even if import liberalisation exceeds the depreciation in the currency (i.e. $dt_m + e_m < 0$), $RER_2 > 0$ when $\beta > w_m$

[8] Following, Edwards (1992), the RER for the economy as a whole can be expressed as: RER = $\alpha RER_{2a} + (1-\alpha)\ RER_{2b}$ where α and (1-α) represent the respective trade weights.

less than that of RER_{2b}.[9] However, tariff liberalisation accompanied by a depreciation in the currency, would cause RER_{2a} to depreciate. The likely effects of this on RER_{2b} would then be ambiguous depending on whether the tariff liberalisation exceeds the depreciation in the exchange rate and the likely income and substitution effects emanating from the implementation of tariff liberalisation. In the latter case, it is thus possible that, with large depreciations in the currency, import prices would not decrease with tariff liberalisation in relative terms.

However, it is important to realize that separate relative price indices provide an indication of how macro-economic and other economic policies affect overall incentives in the economy (Edwards, 1997), and as such one should be careful not to assign the primary importance to trade policy effects without due consideration to the other factors that could have precipitated the change in the RER.[10] The empirical work to date has not always given due consideration to this aspect.

Further, with imperfect competition, domestic prices may not change in the expected direction with trade liberalisation. A possible reason for this may be that lower import prices at the border are not passed onto consumers (Dijkstra, 1997: 8). This could result if there are a few importers dominating the market, or alternatively, if the retail network is dominated by a few sellers.[11] Another reason could be the prevalence of *"pricing to market"* behaviour on the part of foreign suppliers. In this case, profit margins are reduced to absorb the tariff so as to maintain market share. In such cases, tariff liberalisation may not necessarily lead to reduced import prices.[12]

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[9] The depreciation in RER_{2a} depending on the share of imported inputs used in production. For simplicity the income and substitution effects are ignored.

[10] This study attempts to address this issue by distinguishing between the price movements in the price of liberalised and non-liberalised importables.

[11] This was the case for food prices in Nicaragua (see Dijkstra ,1996).

[12] Therefore the analysis of the effects of pass-through effects of tariff changes to import prices is important to ascertain if the envisaged benefits (reduced import prices) is in fact realised. This will be explored further in chapter seven.

6.3 Trade liberalisation and changes in the RER in South Africa during the 1990s.

Chapter four documented the extent of tariff liberalisation during the 1990s. In this section the impact of tariff liberalisation on relative prices using the RER measures outlined in section 6.2 is measured. In order to calculate RER measures of competitiveness one needs separate price series for importables, exportables and non-tradables. This is the focus of the next section.

6.3.1 Developing price measures for tradable and non-tradable sectors

In order to establish the disaggregated price series it is necessary to distinguish between the tradable and non-tradable sectors. While the distinction between tradable and non-tradable sectors is central in many economic theories and models, much of the empirical work has relied on crude estimates to distinguish between the sectors. One such approach relies on *a-priori* assumptions about sectors. Goldstein and Officer (1979) for example, suggest that since exports and imports dominate in the agriculture, mining and manufacturing sectors; these sectors could be regarded as tradable sectors. This distinction was used in a study for Australia (Shann, 1986 cited in Knight and Johnson, 1997), Mauritius (Milner and McKay, 1996) and South Africa (Holden, 1988). However, a major disadvantage of this classification is that it is performed at a fairly aggregate level and as such may lead to inaccuracies in measurement. This may be due to some sub-sectors or industries (for example, in manufacturing) being wrongly classified as tradable when they may not be engaging in trade. In addition, this classification does not allow for a shift between the tradable and non-tradable divide.

Knight and Johnson, (1997) suggest an industry-based approach to distinguish between tradable (exportables and importables) and non-tradable sectors. In this approach, an industry is classified as exportable if it displays a significant degree of export orientation, importable if it is significantly involved in import-substitution and non-tradable otherwise. For the classification of

industries, the threshold values are important. Dwyer (1992), Balassa and Associates (1982) and Knight and Johnson (1997) suggest a threshold value of 10 percent to distinguish between the sectors. The distinction between the sectors is done on the following basis:

- Exportable (E) sectors have an export orientation (exports as a ratio of domestic production) exceeding 10 percent.
- Importable (I) sectors are those in which imports as a ratio of domestic demand exceeds 10 percent.
- Non-tradable (NT) sectors are all the other sectors in the economy excluding the above two cases.
- Tradable sectors include the exportable and importable sectors.

Table 11 classifies the 46 sectors of the South African economy into either exportable (E), importable (I), importable and exportable (I,E) or non-tradable (NT) for the period 1990-2001.[13]

The dynamic nature of the classification procedure is clearly evident from the table as in the case of the food sector, which was classified as non-tradable up until 1995, exportable for 1996 and 1999 and importable for 1997 and both exportable and importable for 1998, 2000 and 2001. The number of non-tradable sectors has decreased from 22 (1990) to 12 (2001) during the period under analysis. Of interest is that the number of sectors that are classified as importable and exportable (I,E) has increased from 8 in 1990 to 25 in 1991. This indicates that a larger number of sectors have been subjected to increased competition in both the domestic and international markets. What has been the role of tariff liberalisation on the competitiveness of these sectors?

[13] The classification in Table 11 is the same used in table 9 (chapter 5). The only difference being that table 11 depicts the annual calculations for the period 1990-2001.

Table 11: Classification of sectors as export promoting, import substituting and non-tradables based on annual trade flows for the period 1990-2001

	Liberalised sectors	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[14	[15]
Agr, Forestry and Fishing		E	E	E,I	E	E	E	E	E	E	E	E	E
Coal Mining		E	E	E	E	E	E	E	E	E	E	E	E,I
Gold and Uranium Mining		E	E	E	E	E	E	E	E	E	E	E	E
Other Mining	L	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I
Food		NT	NT	NT	NT	NT	NT	E	I	E,I	E	E,I	E,I
Beverages		NT	NT	NT	NT	NT	NT	E	E	NT	E	E	E
Tobacco		NT	NT	NT	NT	NT	NT	NT	NT	E	E	E	E
Textiles		E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I
Wearing apparel	L	NT	NT	NT	NT	NT	NT	NT	I	I	E,I	E,I	E,I
Leather		I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I
Footwear	L	NT	NT	I	I	I	I	I	I	I	I	I	I
Wood and wood prod	L	NT	NT	NT	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I
Paper and Paper Prod	L	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I
Print, pub and recording		I	I	I	I	I	I	I	I	I	I	I	I
Coke and ref petrol	L	E	E	E	E	E	E	E,I	E,I	E,I	E,I	E,I	E,I
Basic Chemicals	L	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I
Other chem & Man fibres	L	I	I	I	I	I	I	I	I	I	I	I	I
Rubber		I	I	I	I	I	E,I	E,I	E,I	E,I	E,I	E,I	E,I
Plastic prod	L	NT	NT	NT	NT	NT	NT	I	I	I	I	I	I
Glass and glass product	L	I	I	I	E,I	I	I	E,I	E,I	E,I	E,I	E,I	E,I
Non metallic minerals		NT	NT	NT	NT	I	I	I	I	I	E,I	I	E,I
Basic Iron and Steel	L	E	E	E,I	E	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I
Basic non ferrous metals	L	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I
Metal prod excl machinery		NT	NT	NT	I	I	E,I	E,I	E,I	E,I	E,I	E,I	E,I
Machinery & Equip	L	I	I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I
Electrical machinery	L	I	I	I	I	I	E,I	E,I	E,I	E,I	E,I	E,I	E,I
TV radio and equip	L	I	I	I	I	I	E,I	E,I	E,I	E,I	E,I	E,I	E,I
Professional and scientific	L	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I
Motor vehicles Parts	L	I	I	I	I	I	I	I	E,I	E,I	E,I	E,I	E,I
Other transport	L	I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I
Furniture	L	NT	NT	NT	NT	E	E	E	E	E,I	E,I	E,I	E,I
Other manufactures	L	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I
Electricity, gas and steam	L	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Water supply		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Building construction		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Civil engineering and other construction		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Wholesale and retail trade		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Catering and accommodation services		E,I	E,I	I	I	E,I	E,I	E,I	E,I	E,I	E,I	E,I	E,I
Transport and storage		E	E	NT	NT	E	E	E	E	E	E	E	E
Communication		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Finance and insurance		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Business services		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Medical, dental and veterinary services		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Services excl med, dental and vet services		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Other producers		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
General government services		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

Source: Own calculations with data from TIPS.

Table 11 (column 2) also refects those sectors that have become more liberalised during the 1990s. This classification is based on the relative change in the average effective rate of protection (ERP) measures between the period 1988-93 and 1994-98 (as specified in column 10 of table 6).

Using these industry classifications the price series for exportables, importables, non-tradables and tradables are established. This is reflected in table 12.

Table 12: Price series of exportables, importables, tradables and non-tradables

Year	P_m	P_m^l	P_m^{nl}	P_n	P_x^1	P_x^2	P_x^3	P_t
1990	65	65	62	56	68	66	69	65
1991	68	70	70	64	70	69	72	69
1992	76	75	78	74	71	72	77	74
1993	83	83	83	84	82	82	83	82
1994	90	90	90	91	91	91	93	91
1995	100	100	100	100	100	100	100	100
1996	107	107	106	108	110	109	108	108
1997	115	115	116	119	115	115	116	115
1998	120	120	122	127	121	121	129	121
1999	127	128	128	135	128	129	138	128
2000	141	145	132	144	146	146	157	143
2001	155	155	155	154	160	160	183	158

Source: Own calculations with data from Quantec.

The price of importables (P_m) is the weighted sum of the GDP deflators of the importable sectors.[14] Similarly the price of non-tradables is given by the weighted sum of the GDP deflators of the non-tradable sectors. Three different calculations for the price of exportables are undertaken. P_x^1 is an export weighted sum of the GDP deflators of the exportable sectors.[15] P_x^2 is an export-weighted sum of the price of exports of the respective industries.[16] P_x^3 is the export price series calculated by the South African Reserve Bank (SARB).[17] It is interesting to note that there is very little difference between

[14] The Laspeyres price index formula was used which is given by $P = \sum w_{it} \frac{P_{it}}{P_{i0}}$ where w_{it} reflects the share of industry *i* contribution to the total value of output of the importables sector in time period t. P_{it} is the price index of the commodities produced by industry *i* in period *t* and P_{i0} the price index of the commodities produced by industry *i* in the base period. The price indices were proxied by the GDP industry deflators and were obtained from the TIPS standard industrial classification database.

[15] The weight used in the calculation of the index is the share that the respective industries contribute to the value of exports of the exportable sectors.

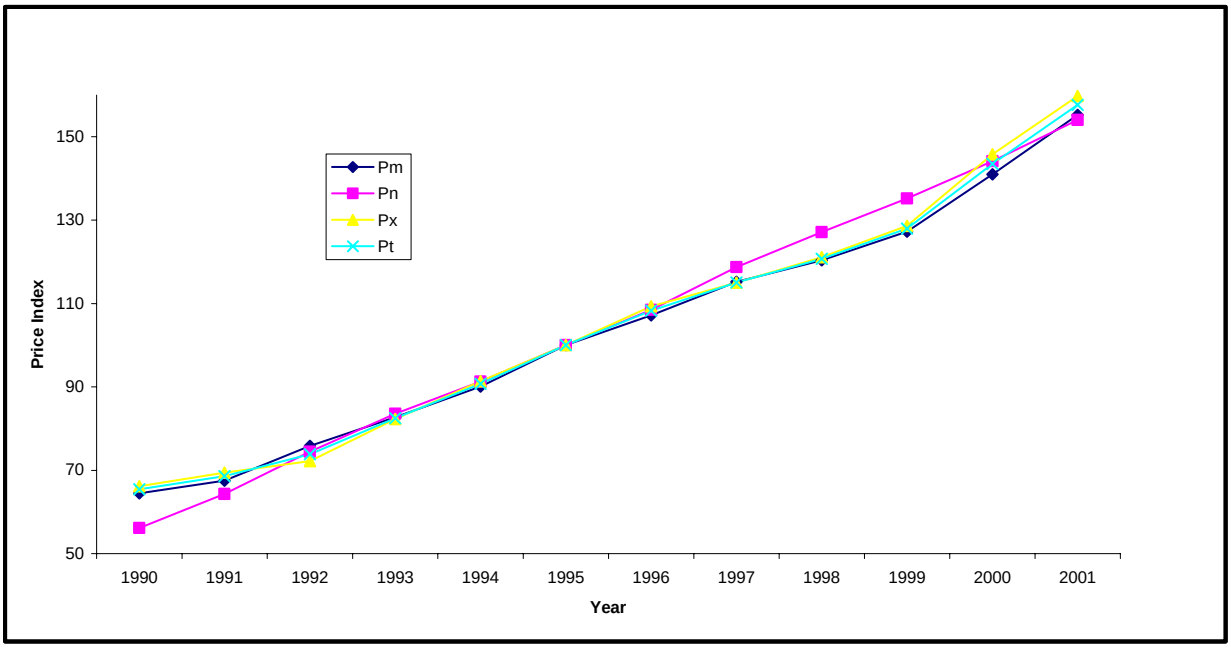
[16] The index was constructed from the export price series of the respective industries, which was obtained from the TIPS standard industrial classification database.

[17] The export price series calculated by the SARB, is an extrapolation done from unit values of some of South Africa's major export commodities. The major difference between P_x^2 and

P_x^1 and P_x^2 which implies that there is very little difference between the prices charged for domestic goods and similar goods that are exported. However, the price series of the SARB (P_x^3) shows a significant upward divergence after 1995. This may primarily be due to the SARB index being dominated by resource intensive commodities and as such the depreciation of the currency, coupled with the increases in commodity prices during the latter part of the 1990s, may have biased the price index upwards.[18] P_t is a weighted sum of P_x^2 and P_m.[19]

Figure 5 graphically depicts the price indices for the importable, exportable and non-tradables sectors.[20]

Figure 5: Exportables (P_x), Importables (P_m), Tradables (P_t) and non-tradables (P_n)



Source: Constructed using data from table 12.

P_x^3 is that the former is derived from the GDP deflators of all the exportable *industries* while the latter considers the export unit values of some of South Africa's major export *commodities*.

[18] The nominal effective exchange rate depreciated by 35 percent between 1990-95 and by 43 percent between 1995-2001.

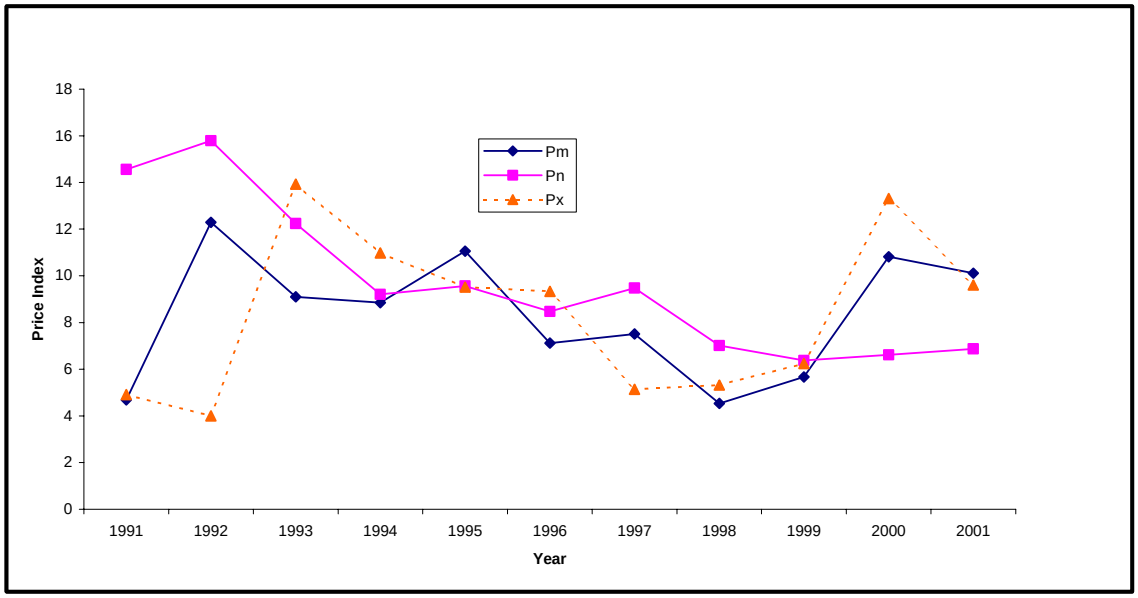
[19] The weights being made up of exports and domestic demand for exportables and importables respectively.

[20] Export prices used in the graph are given by P_x^2 and import prices by P_m in table 12.

In general, the trend is the same for all the price series. However, during the early 1990s, exportables' and importables' prices increased faster than those of non-tradables. Between 1996 and 2000, non-tradable prices increased faster than those of exportable and importable prices with a relative moderation in the price of tradables being particularly evident between 1995 and 1999.

The moderation in prices is analysed by considering the annual rate of increase in the price of exportables, importables and non-tradables sectors (see figure 6).

Figure 6: Growth rate of exportable (Px), importable (Pm) and non-tradable (Pn) prices



Source: Own calculations with data from table 10.

This is informative as it gives an indication of the trend in the rate of price increases. The three price series have the same trend. Throughout the period under analysis there has been a continuous deceleration in the price of non-tradables, to the extent that, by the end of the period under analysis, the annual rate of increase in prices was lower than that of the exportable and importable commodities. The price of importables show a moderation in their rate of increase from 1995 to 1998 and exportables from 1993 to 1997. However, the price increases of importables (since 1998) and exportables (since 1997) have accelerated quite rapidly. However, it is important to

realise that the competitiveness of an industry does not depend on absolute but relative prices. This aspect is explored in a little more detail in the next section.

6.3.2 Trade liberalisation and its effect on prices during the 1990s

P_m^l (in table 12) reflects the price series for those importable sectors that were liberalised and P_m^{nl} those importable sectors that were not liberalised.[21] The liberalised sectors are those sectors that are reflected under column 2, table 11. One advantage of distinguishing between the liberalising and non-liberalising sectors is that it provides an indication of the likely impact of trade (tariff) liberalisation on prices. In other words, if one assumes that all other effects (e.g. exchange rate changes, substitution and income effects, cost influences, etc) are uniform across the importables sector, then any divergence between P_m^l and P_m^{nl} would be due to trade liberalisation measures. P_m^l and P_m^{nl} show very little divergence from each other implying that the price of importables that were liberalised increased at the same pace as those that were not liberalised.[22] This suggests that the liberalisation implemented during the 1990s may not have had the intended (expected) effect of reducing the prices of importables.

Tsikata (1999:10) argues that tariffs had a reduced impact on prices during the 1990s. Figure 6 provides some implicit support for this, in the sense that there is a moderation in increase in all tradable (exportables, importables and tradables) prices during the period of trade liberalisation (particularly between 1995 to 1999). However, on closer examination, it should be noted that the moderation in prices had begun in the early 1990s - some time before the implementation of the tariff reform in 1995. Thus the deceleration in prices suggests that there may be other factors (for example, the ending of sanctions) that could have played a greater role in improving competitiveness than tariff liberalisation *per se*.

[21] The weights used were the respective industries' share to the value of output of the liberalised and non-liberalised importable sectors.

In addition, Tsikata's (1999) conclusions are drawn by comparing the local currency value of manufactures (MUVLC) and the domestic import price of manufactures (PPIM). MUVLC is proxied by *"…the product of the US dollar-based international manufactures unit value and the nominal exchange rate vis-à-vis the US dollar"* (*ibid.*) and this is taken to represent the expected rate of increase in domestic prices. A comparison (of MUVLC and PPIM) is taken to reveal whether import prices (PPIM) has in fact come down faster than what could have been expected (MUVLC). However, some reservations can be expressed about the proxies used in the analysis. Firstly, the manner in which MUVLC is calculated does not give due recognition to the major differences between the structure of the US manufacturing sector *vis-à-vis* that of South Africa.[23] Secondly, PPIM represents the price of imports and not necessarily importables. In analysing the effects of liberalisation one is concerned about the impact of trade liberalisation on the price of importables.[24]

As mentioned earlier in the theoretical section, a measure of the internal competitiveness of a sector is obtained by considering the price indices for the importables, exportables and tradable sectors relative to the price index for non-tradables (Dwyer, 1992: 451). An increase (decrease) in any of these relative prices represents a decline (improvement) in competitiveness. The price indices are reflected in table 13.

The RER measures recorded in table 13 reveal some interesting characteristics of the tradable sectors. All indices depict a declining trend (improved competitiveness) for most of the period.[25] Once again, it is evident that the improvement in competitiveness during the major part of the 1990s,

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[22] With the exception of 1992, 1997 and 1998, the price index for liberalised sectors was either the same (for most of the years) or even higher (as in 1996, 2000) than that for non-liberalised sectors.

[23] The US manufacturing sector is composed of more technology intensive sectors.

[24] As argued earlier, it may the case that due to lack of competition between importers, the benefits of lower import prices may not be passed onto consumers.

[25] During 2000 and 2001 there was a relative decline in the competitiveness of the tradable sectors.

started before the implementation of tariff reform. In addition, the fact that the competitiveness of the non-liberalised sectors ($\frac{P_m^{nl}}{P_n}$) differs very little from the liberalised sectors ($\frac{P_m^{l}}{P_n}$) also calls into question the extent to which tariff liberalisation may have increased competitiveness during the 1990s.

Table 13: Relative prices of exportables, importables, tradables and non-tradables

Year	$\frac{P_t}{P_n}$	$\frac{P_x}{P_n}$	$\frac{P_m}{P_n}$	$\frac{P_m^l}{P_n}$	$\frac{P_m^{nl}}{P_n}$
1990	117	118	115	116	110
1991	107	108	105	109	108
1992	99	97	102	101	104
1993	99	98	99	99	100
1994	99	100	99	99	99
1995	100	100	100	100	100
1996	100	101	99	99	98
1997	97	97	97	97	98
1998	95	95	95	94	96
1999	95	95	94	94	95
2000	100	101	98	100	92
2001	102	104	101	101	100

Source: Table 12, own calculations.

6.4. Conclusion

In this chapter the competitiveness of the tradable sectors *vis-à-vis* the non-tradable sectors is analysed using a variant of the conventional RER measure. While the increased globalisation of production could have contributed to the improved competitiveness of the tradable sectors, the evidence presented in this paper suggests that tariff liberalisation (which essentially began in 1995) may have played a minimal role in improving the level of competitiveness of South Africa's manufacturing sector. It could be the case that factors such as the ending of sanctions, pricing to market behaviour on the part of foreign suppliers, domestic and international cost factors, etc. could have been more important determinants of competitiveness. These aspects will be tested econometrically in chapter seven.

CHAPTER SEVEN
TARIFF LIBERALISATION AND PRICE COMPETITIVENESS - AN ECONOMETRIC ANALYSIS[1]

7.1 Introduction

In chapter six the importance of distinguishing between the price of imports and the price of import substitutes is distinguished. The former is the price of imports at the border, whereas the price of import substitutes refers to the price charged by the domestic industry for similar goods. The distinction is important since importers may be highly concentrated with a result that tariff liberalisation may not necessarily put downward pressure on domestic prices. In this chapter an econometric analysis is undertaken of:

- the relationship between tariff changes and import prices, and
- the relationship between tariff changes and the price of import substitutes.

Sections 7.2 and 7.3 highlight some theoretical considerations pertinent to the analysis at hand. Section 7.4 outlines the methodology used in the econometric analysis. The econometric results are presented in section 7.5 while section 7.6 concludes.

7.2 Changes in Import prices

Empirical evidence suggests that macroeconomic conditions influence tariff policy (Bohara and Kaempfer, 1992; Das and Das, 1994; Hall, Kao, and Nelson, 1998; Henriques and Sadorsky, 1994; Krol, 1996; Thornton and Molyneux, 1997). The usual explanation is that political pressure for protection is strongly correlated with economic performance - protection rises with unemployment and decreases with economic growth (Sherman, 2002: 1). However, Irwin (1998) has shown that much of the variation in U.S. tariffs has

[1] I am greatly indebted to Professor Suzanne McCoskey of the US Naval Academy for valuable comments and assistance relating to the econometric tests used in this chapter. In addition Greg Farrel of the South African Reserve Bank provided valuable comments on an earlier draft of this chapter.

been due to changes in import prices rather than policy changes.[2] These results highlight the possibility that the link between macroeconomic fluctuations and tariffs identified in many studies may be due to price changes rather than from political pressure induced policy changes (Sherman, 2002).

Fluctuations in the prices of traded goods have attracted much attention in the empirical literature in recent times. The pass-through relationship between exchange rate fluctuations and traded goods' prices has been one of the focal areas of this attention. The consensus in the empirical work to date is that pass-through effects from exchange rate fluctuations to traded goods' prices tend to be incomplete – the so called “incomplete pass-through” phenomenon. This result has been particularly robust for import prices. Import prices do not fall (increase) by as much as the currency appreciates (depreciates) (Woo, 1984; Dornbusch, 1987; Krugman, 1987; Gagnon and Knetter, 1992; Menon, 1995b, 1999; Goldberg and Knetter, 1997).

The pass-through effects of changes in tariffs on import prices have also attracted some attention in the economic literature (albeit more limited than exchange rate fluctuations). Svedberg (1979) and Brander and Spencer (1984) argue that under monopoly conditions, a lowering of tariffs may be less than fully passed through to import prices. In addition, there may be a “terms of trade” justification for import protection, which is due to imperfect competition in the exporting country rather than to the traditional large import country case (Feenstra, 1989)[3].

In general, the empirical work has found that there is less than complete pass-through effects of exchange rate and tariff changes to import prices. Models of imperfect competition have been used to explain the incomplete pass-through effects. "Pricing to market” behaviour on the part of foreign suppliers may

[2] The *ad-valorem* effect of specific (per-unit) duties fell as import prices rose. With specific duties in the tariff schedule, average tariff rates changed with changes in import prices even though there was no explicit change in the tariff policy.

[3] Feenstra (1989) is the seminal contribution on tariff pass-through to import prices. This paper analyses the effect on US prices of tariffs and exchange rates on Japanese cars, trucks and motorcycles. The increase in US tariffs led to a decrease in Japanese export prices to the US, thus implying a terms-of-trade gain for the US.

account for destination currency prices not fully responding to changes in the nominal exchange rate and tariff rates. The ability of exporters to discriminate across markets ("price to market") depends on the type of the good (substitutability of the good) and the industry structure (degree of competition or strategic intervention in the market) (Goldberg and Knetter, 1997).[4]

One of the main justifications for a policy of tariff liberalisation is the impact it is meant to have on competitiveness. Tariff changes are seen as affecting competitiveness through their impact on import prices. The conventional argument is that, *ceteris paribus*, tariff liberalisation is expected to result in a reduction of prices.[5]

The relationship between tariffs and prices can be represented as in figure 7. As far as import prices are concerned, it is important to distinguish between final goods imports and intermediate goods imports. For simplicity, it is assumed that there is complete pass-through of tariff changes into import prices. In other words, the full reduction (increase) in tariffs is passed on to import prices.[6] Firstly, considering the case of intermediate imports, a reduction in tariffs will lead to a reduction in the prices of imported intermediate goods. This in turn reduces production costs, which in turn, will lead directly to improved price competitiveness, both in the domestic and international market.[7] Secondly, a reduction in tariffs will lead to a reduction in the prices of final imported goods. Under conditions of perfect competition, this should place downward pressure on the price of import competing products. The reduction in the prices faced by producers of import competing goods will promote efficiency gains in domestic production and/or force a reallocation of resources. Tariff liberalisation on both inputs and outputs has a positive impact on price competitiveness.

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[4] There is some controversy on the determinants of exporters mark-up in the long-run. See Goldberg and Knetter (1997) for a good summary of the issues. In general, it is assumed that the competitiveness in the market will be one of the more important determinants of the rate of mark-up (Hung et al, 1993, Hooper and Mann, 1989).

[5] The extent to which tariff liberalisation improves competitiveness depends on the extent of the pass-through effects of tariff changes to import prices.

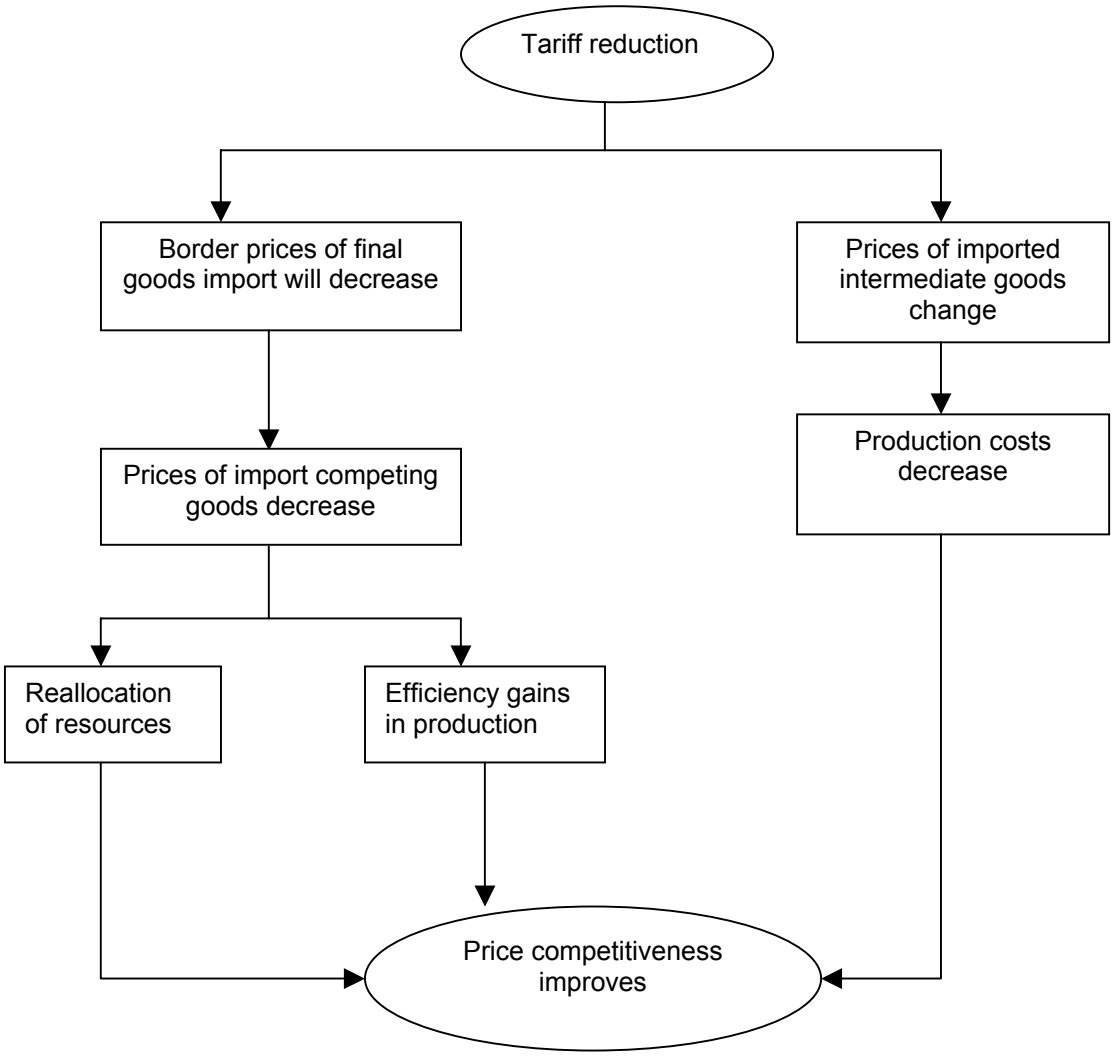
[6] The different pass-through effects are elaborated upon later on in this chapter.

[7] In this case, the impact on production costs will depend on the share of intermediate inputs in production costs.

From figure 7 it is apparent that the impact of tariff liberalisation on competitiveness depends on the various pass-through effects of tariff changes to import prices. In summary, South Africa's manufacturing liberalisation policy will be appraised by considering:

- Firstly, the pass through effects from tariff changes to import prices at the border.
- Secondly, the impact of border import prices on the price of importables, and finally,
- The impact of tariff liberalisation on input costs.

Figure 7: The effect of a tariff reduction on import prices



7.3 The relationship between tariff changes and the prices of imports, importables and input costs.

In this section, the models that will inform the empirical analysis of South Africa's tariff liberalisation policy during the 1990s are set out.

7.3.1 Relationship between tariff changes and import prices[8]

Starting from the purchasing power parity doctrine with no transport, distribution costs and tariffs, one gets:

$$P = P^w E \quad \text{.....(26)}$$

where P = import prices in domestic currency (P_t) in time period t,

P^w = world price in time period *t* in foreign currency, and

E = exchange rate quoted as Rands per unit of foreign currency.

The implication is therefore that the same traded good will sell at the same price when expressed in a common currency in different destinations. However, if one now assumes the existence of tariffs, then equation (26) translates into

$$P = P^w E(1+T) \quad \text{.....(27)}$$

where T = tariff rate.

The long-run relationship can be estimated from a log-linear transformation of equation (27) which allows for a constant (α_1):

$$\underset{(+)}{LP} = \alpha_1 + \underset{(+)}{\alpha_2 LP^w} + \underset{(+)}{\alpha_3 LE} + \alpha_4 L(1+T) + \varepsilon \quad \text{.....(28)}$$

where ε is the stochastic error term, and α_2 is the elasticity measure for foreign prices. In addition, α_3 and α_4 are the conventional pass through estimates for exchange rate and tariff changes to import prices.[9] The expected signs of the coefficients are reflected above the variables in

[8] Domestic import prices refer to the price of imports at the border.
[9] See Feenstra (1989) for a similar specification.

equation (28). Under the small country assumption with perfect competition, importers would be price takers and world price (P^w), exchange rate (E) and tariff changes $(1+T)$ should be fully absorbed into domestic import prices $(\alpha_2 = \alpha_3 = \alpha_4 = 1)$. However, where the coefficients are less than unity ($0 \le \alpha_2, \alpha_3, \alpha_4 \le 1$), this implies that foreign exporters hold some degree of market power and can therefore independently influence domestic currency prices. If α_4 is less than unity (α_4<1), this implies that the full effects of the tariff change have not been passed on to prices.

As far as the tariff factor $(1+T)$ is concerned, a rise (decrease) in tariffs is expected to lead to an increase (decline) in the domestic price of imports (P). The rate of influence depends on the magnitude of the coefficient α_4. *Ceteris paribus*, tariff liberalisation having the desired effect of improving competitiveness would entail α_4 being significant and close to 1.[10]

7.3.2 Impact of import prices on the prices of import substitutes

As mentioned earlier, it is necessary to test the impact of import prices at the border on the price of importables (i.e. the price charged by domestic industry). Drawing on the theory of industrial organisation and a simple mark up model, results in domestic or importables prices (P_d) being a constant mark-up $(1+m)$ over unit costs (u).[11] Mark-up models are beneficial in the sense that it can be used under conditions of imperfect competition (Eichner, 1973; Lovoie, 1996) and have been extensively used in the empirical literature to analyse price competitiveness (see Hooper and Mann (1989); Athukorala, 1991; Swift , 1998).[12] A simple mark-up model can be represented as:

$$P_d = (1+m)*(u) \quad \text{...(29)}$$

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[10] However, as pointed out in the previous section, this would also depend on the extent to which the border price of imports influences the price of import competing domestic production (prices charged by domestic industry).

[11] See Hooper and Mann (1989); Athukorala (1991); Swift (1998) for applications of mark-up models within the context of evaluating price competitiveness.

[12] Under conditions of perfect competition price equals marginal cost. However, under conditions of imperfect competition and a downward sloping demand good, price will exceed marginal cost.

Both the mark-up and unit costs are expected to be positively correlated with domestic prices - increases (decreases) in their levels would cause domestic prices to increase (decrease). Stated differently, price competitiveness is influenced by two factors, namely, the extent of the mark-up and the level of unit costs.

Assuming that the mark-up $(1+m)$ is influenced by the magnitude of price and quantity competition from abroad as well as movements in the domestic aggregate price level in general (Chand and Sen, 1998). It is to be expected that the price of imports in domestic currency (P) would be positively correlated with the mark-up coefficient (Athukorala and Menon, 1994). In addition, an increase in imports as a share of domestic demand (I) is expected to exert downward pressure on the level of mark-up.[13] Further, the aggregate price level (c) is expected to be positively correlated with the level of mark-up .[14]

Algebraically this can be expressed as :

$$(1+m) = f(P, I, c) \quad \text{.....(30)}$$

Substituting for (P) from (27) gives:

$$(1+m) = f[P^w E(1+t), I, c] \quad \text{.....(31)}$$

Substituting for $(1+m)$ in equation (29) and considering a log transformation that allows for a constant (β_0) gives:

$$\underset{(+)}{} \quad \underset{(+)}{} \quad \underset{(+)}{} \quad \underset{(+)}{} \quad \underset{(+)}{} \quad \underset{(-)}{}$$
$$LP_d = \beta_0 + \beta_1 LP_t^w + \beta_2 LE + \beta_3 L(1+t) + \beta_4 Lc + \beta_5 Lu + \beta_6 LI + \varepsilon_t \quad \text{.....(32)}$$

Equation (32) reflects the main determinants of the domestic price of import substitutes. β_1 captures the influence of foreign prices on domestic prices.

[13] In terms of the terminology used earlier, the world (import) prices in domestic prices is given by the border price of imports.

[14] The movement in the price level is taken to reflect domestic economic conditions. Domestic producers are likely to increase prices if the general price level increases.

The elasticity measures for changes in exchange rates and tariff rates are represented by β_2 and β_3 respectively.[15] Ideally, one should also include a measure of industry concentration in the specification of equation (31) but a suitable measure or a proxy is not available on a time series basis. However, some inferences can be drawn from β_2 since it gives an indication of the extent of import parity pricing prevalent in the economy.[16] Import parity pricing behaviour could be an indication that some form of monopoly practice is prevalent. β_4 captures the effect of domestic economic conditions on prices. Finally, β_5 and β_6 reflect the influence of unit costs and import quantity on the price of importables. The expected signs are reflected above the coefficients.

7.3.3 Impact of tariffs on input costs

It should be noted that β_2 and β_3 in equation 31 capture the "indirect effects" of exchange and tariff influences on domestic prices.[17] The "direct effects" of exchange rate and tariff changes influence domestic prices through their impact on imported input costs.[18] Imported inputs form part of unit costs *(u).* The cost variable *(u)* comprises domestic input costs (u_d) and imported input costs (u_i). This is given by:

$$u = u_d + u_i \quad \text{.....(33)}$$

$$u = u_d + [P^{wi} * E * (1+t)] \quad \text{.....(34)}$$

where $u_i = P^{wi} * E * (1+t_i)$

P^{wi} = world price of imported inputs

t_i = tariff on inputs

Considering a log transformation of 34 gives:

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[15] In this case, β_3 captures the effect of the tariff on the price of import substitutes whilst in equation 28, α_4 captures the effect on the price of imports at the border.

[16] A high value of β_2, for example, would indicate high pass-through effects for exchange rate changes which in essence means that the price of import substitutes is greatly influenced by exchange rate changes.

[17] In a theoretical sense, the change in output tariff is expected to lead to reduced import prices, X-efficiency effects and finally, to reduced prices. It is for this reason that the effect of output tariffs are termed "indirect" effects.

[18] Since the change in input tariffs impact directly on production costs, it is referred to as "direct" effects.

$$Lu = \gamma_0 + \gamma_1 Lu_d + \gamma_2 LP^{wi} + \gamma_3 LE + \gamma_4 L(1+t_i) + \varepsilon_t \quad \text{.....(35)}$$

where the coefficients γ_1 γ_2, γ_3 and γ_4 measure the effect of changes in domestic input costs, world prices, exchange rates and tariffs on unit costs respectively.

7.4 Data and methodology used in the analysis

Before reporting the results, the data and methodology used in the econometric tests is briefly explained.

7.4.1 Data used in estimation

The period of analysis extends from 1990 to 2001. Due to data constraints relating to suitable proxies for world prices, 25 manufacturing industries were considered in the analysis (see table 14).[19]

Table 14: Manufacturing industries considered in analysis

Industries	SIC (version 5)
Food	301-304
Beverages	305
Tobacco	306
Textiles	311-312
Wearing apparel	313-315
Leather and leather products	316
Footwear	317
Wood and wood products	321-322
Paper and paper products	323
Printing, publishing and recorded media	324-326
Basic chemicals	334
Rubber products	337
Plastic products	338
Glass and glass products	341
Non-metallic minerals	342
Basic iron and steel	351
Basic non-ferrous metals	352
Metal products excluding machinery	353-355
Machinery and equipment	356-359
Electrical machinery and apparatus	361-366

[19] These 25 sectors were the major contributors to manufacturing GDP, accounting for 86 percent (87 percent) of GDP in 2001(1990).

Table 16: Manufacturing industries considered in analysis (continued)

Professional and scientific equipment	374-376
Motor vehicles, parts and accessories	381-383
Other transport equipment	384-387
Furniture	391
Other manufacturing	392-393

Source: TIPS database

The exchange rate is the nominal effective exchange rate expressed as the number of domestic currency units per foreign currency and was obtained from the South African Reserve Bank.[20] The world price (P^w) was proxied by the US producer price index (PPI) of the relevant sector and was sourced from the Bureau of Labour Statistics. Import prices (P_i) were sourced from the standard industrialisation classification database housed at TIPS.[21] The price of import substitutes (P_d) is given by the GDP deflator of the respective industries. The US producer price index of the relevant sector (P^w) was used as a proxy for the world price of imported inputs (P^{wi}).[22] In addition, t and t_i represent the tariff collected on output and inputs.[23] Unit cost (u) is derived

[20] An increase in the index depicts a depreciation. The four currency NEER was used since manufacturing imports are predominantly invoiced in these currencies.

[21] Unless otherwise stated all data were sourced from the standard industrial classification database housed at TIPS. P_t is based on the PPI for imported commodities.

[22] The implicit assumption here is that world intermediate input prices increased at the same rate as those for world final goods prices. Given the structure of the US economy this was considered not an unrealistic assumption.

[23] t_i was derived from the effective rate of protection (ERP) formula. Considering a linear relationship between inputs and outputs with a_{ij} the input-output coefficient for the i^{th} input used in the production of the j^{th} output. In addition if the nominal tariff level on j is given by t_j, nominal tariff on input b by t_b and the share of inputs b in the costs of j without tariffs by $\sum_b a_{bj}$, then the effective rate of protection (ERP) is given by:

$$ERP = \frac{t_j - \sum_b a_{bj} t_i}{1 - \sum_b a_{bj}}$$

From the above equation the tariff on inputs (t_i) for j is given by:

$$t_i = \frac{\sum_b a_{bj} t_b}{1 - \sum_b a_{bj}}$$

by considering total intermediate input costs as a ratio of industry GDP at constant prices (Chand and Sen, 1998).[24] Foreign competitive pressure (I) is proxied by the import penetration ratio (i.e. imports as a share of domestic demand). The GDP deflator for the manufacturing sector was used as a proxy for general price level (c).

7.4.2 Methodology

In this study, panel data estimations for the manufacturing sector are undertaken. The application of estimation methods, which exploit panel data techniques, has increased in prominence in both the theoretical and empirical economic literature. This popularity is in part due to the increased availability of data of this type, as well as, the potential of panel data studies to answer questions not possible either from a cross-section or within a pure time series context.[25]

It is important to investigate the stochastic properties of the data in order to ensure that correct inferences are made. The use of panel unit root and cointegration tests enables one to determine the long-run impact of tariff liberalisation on price competitiveness. The analysis of unit roots and cointegration in panel data has now become standard practice following the seminal contributions by Levin and Lin (1992, 1993) and Quah (1994).[26] In the sections that follow, the tests that were used are first outlined after which the results of the tests are reported.

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[24] The data is at constant 1995 prices. Similarly, domestic input costs (u_d) and imported intermediate costs (u_i) are proxied by the ratio of domestic input costs and imported input costs as a ratio of industry GDP at constant prices respectively.

[25] In the South African context, it is acknowledged by the customs authorities that trade data preceding 1992 (and especially pre-1990s) is not very reliable. The unreliability is due to poor customs records, as well as, a significant proportion of South Africa's trade being unclassified during the sanctions era. The short period since 1990 thus increases the attractiveness of panel estimations of South Africa's trade relations or patterns.

[26] These developments have followed similar advancements in time series analysis. Given that the variables may be non-stationary, levels regressions may give rise to the familiar spurious regression problem. In the context of I(1) variables, modelling in levels is justified if the level variables are able to form a cointegrating vector.

7.4.2.1 Unit root test

Im, Persaran and Shin (1997) have developed an Augmented Dickey-Fuller (ADF) type unit root test that increased the power of univariate unit root tests by exploiting the panel structure of the data.[27] The test is valid in the presence of heterogeneous cross sectional units for the null of non-stationarity. The Im, Persaran and Shin (IPS) test is based on the ADF test[28]:

$$\Delta y_t = \alpha + \delta_t + \rho y_{t-1} + \sum_{j=1}^{p} y_j \Delta y_{t-j} + \upsilon_t \quad \text{.....(36)}^{29}$$

where ρ denotes the number of lags.

The basic issue with panel data is how to combine information on stationarity or non-stationarity for each individual cross-section into a conclusion about the panel as a whole (McCoskey and Kao, 1999: 675). Assuming that the cross-sections are independent, the IPS test combines information by averaging the individual ADF t-statistics and is given by the following equation:

$$\Psi_{\bar{t}} = \frac{\sqrt{N}(\bar{t}_{N,T} - E[\bar{t}_{N,T}(p,0)]}{\sqrt{Var(\bar{t}_{N,T})}} \Rightarrow N(0,1), \quad \text{.....(37)}$$

where $\Rightarrow$ denotes convergence in distribution, $\bar{t}_{N,T} = (1/N)\sum_{i=1}^{N} t_i$, t_i is the t-statistic for the OLS estimate of p in equation 36 for the *i*th unit of the cross-section, and $E[\bar{t}_{N,T}(p,0)]$ is taken under the null hypothesis $\rho_i = 0$ for all *i* and with the choice of $\rho = (\rho_1, \rho_2, \ldots, \rho_i, \ldots, \rho_N)'$ of the lag-length vector for the regressions unit by unit in equation 3. $\Psi_{\bar{t}}$ can be compared to critical values for a one-sided N(0,1) distribution. The moments of $\bar{t}_{N,T}$ depend on the

[27] Im et al (1997) modified the simple panel root tests developed by Levin and Lin (1992, 1993). Maddala and Wu (1999) have addressed some of the shortcomings in these tests by addressing the issue of unbalanced panels and choice of lag lengths in the ADF regressions. However, since a balanced panel is available, these concerns do not apply and the Im et al (1997) tests are used.

[28] See McCoskey and Kao (1999) and Baltagi (2001) for a more detailed exposition of the test.

[29] In the empirical analysis it is assumed that the individual series do not contain a trend. In this case the equation is given by: $\Delta y_t = \alpha + \rho y_{t-1} + \sum_{j=1}^{p} y_j \Delta y_{t-j} + \upsilon_t$.

number of time series observations and the appropriate lag order (ρ_i) for each cross-section.

Under the null hypothesis of a unit root this statistic has a standard normal distribution and is valid in the presence of heterogeneity across industries as well as residual serial correlation across time periods.[30] As it is a one-sided test, a statistic less than –1.645 rejects the null of non-stationarity at the 5 percent level.[31] Results for IPS unit root tests for all the variables used in the analysis are contained in Table 15.

Table 15: Unit Root tests

Description of variables	Variable	IPS
Log(Import prices)	LP_i	9.697
Log(prices of import substitutes)	LP_d	-3.962*
Log(World Prices)	LP^w	-2.115*
Log(Tariff factor-final goods)	$L(1+t)$	-2.103*
Log(Exchange rate)	LE	20.587
Log(Unit Cost-total)	LU	-2.697*
Log(Imports as a share of domestic demand)	LI	-1.157
Log(Price of Importables)	LP_d	-3.962*
Log(Domestic economic conditions)	LC	-5.240*
Log(Unit Cost-domestic)	LU_d	-1.731*
Log(Tariff on inputs)	$L(1+t_i)$	0.207

Notes: *significant at the 5% level (critical value is -1.645) and the sample period 1990 to 2001.

Source: Own calculations.

The variables import prices (LP_i), exchange rate (LE), share of imports (LI) and tariff on inputs [$L(1+t_i)$] are all I(1) while all the other variables are stationary.

[30] Under the alternative of stationarity, the statistic diverges to negative infinity.
[31] It was assumed that none of the individual series in the model contains a trend, i.e. in terms of equation 11, δ_t=0.

7.4.2.2 Cointegration tests

Rejection of the null of nonstationarity implies that cointegration tests for panel data have to be undertaken. Following the methodology proposed in McCoskey and Kao (2001) cointegration tests were undertaken. However, it is important to ensure that the regressors themselves are not cointegrated (McCoskey and Kao,1999).[32] If cointegration exists between the dependent and independent variables (but not among the independent variables), then an error correction model (ECM) should be estimated. An advantage of the ECM is that it incorporates an error correction term (ECT) that reflects the dynamics leading to the long-run equilibrium position. In the ECM, the cointegrating vectors give the long-run relationship while the coefficient of the ECT depicts the short-run adjustments to the long run equilibrium position. If the data are not cointegrated then, the panel VECM reduces to a VAR in first differences.

The test results for cointegration amongst the variables used in equations (28), (32), (35) are reflected in table (16).[33]

Table 16: Cointegration test results

Equation	Variables	ADF	PP
Equation 28	LP, LE, LP^w, L(1+T)	-5.884	-7.964
	LE, LP^w, L(1+T)	2.662	4.447
Equation 32	LP_d, LE, LP^w, L(1+T), Lc, Lu, Ll	6.519	-10.668
Equation 35	Lu, Lu_d, LP^w, LE, L(1+t_i)	7.368	-7.102

Notes: A value less than the one sided critical value of 1.645 rejects the null of no cointegration at the 5% level of significance.
Source: Own calculations

7.4.2.3: Fixed effects and poolability

Test results for the joint significance of the fixed effects and poolability tests are reported in Table 17. The joint significance of the fixed effects was tested by the following *F-test* described by Baltagi (2001: 14):

$$F_0 = \frac{(RRSS - URSS)/(N-1)}{URSS/(NT-N-K)} \overset{Ho}{\sim} F_{N-1,N(T-1)-K} \qquad \text{.....(38)}$$

[32] If the regressors are cointegrated then this would require that the model be re-specified.

The restricted sums of squares (RRSS) was obtained from the OLS on the pooled model and the unrestricted residual sums of squares (URSS) was obtained from the LSDV regression, where K is the number of regressors, N is the number of cross sections and T is the number of years. The null of no individual effects was rejected at the 5 percent level of significance for all the equations.

The following test statistic described by Baltagi (2001: 53) was applied to test for poolability of slopes allowing for varying intercepts under the assumption that $\mu \sim N(0,s^2 I_{NT})$[34]:

$$F_{obs} = \frac{(e'e - e'_1e_1 - e'_2e_2 - \cdots - e'_N e_N)(N-I)K'}{(e'_1e_1 + e'_2e_2 + \cdots + e'_N e_N)/N(T-K')} \quad \text{.....(39)}$$

Under H_o, F_{obs} is distributed as F((N - 1)K′, N(T - K′)). Hence the critical region for this test is defined as:

$$\{Fobs > F((N-1)K', NT - NK'; \alpha_o)\} \text{.....(40)}$$

where α_0 denotes the level of significance of the test, K is the number of regressors, N is the number of cross sections and T is the number of years.

The URSS was obtained from summing the RRSS from the 25 individual industry OLS regressions, while the RRSS was obtained from the LSDV model. With the exception of equation (28), the null of poolability was rejected at the 5 percent (but not at the 1 percent) level of significance for equation (26) (see table 17 below).[35]

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[33] The significance of these results are explained when the results of the model are presented in the sections that follow.

[34] In this case, H_0 represents the null of poolability (i.e. all slopes are the same across cross sections).

[35] However, this is not considered to be a major problem, since it is quite common to estimate pooled models even though the null of poolability is rejected (Baltagi and Griffin, 1997: 308).

Table 17: Tests for Poolability and Fixed Effects

Poolability test		Fixed effects test	
Equation	**Test statistic**	**Equation**	**Test statistic**
Equation no 28	1.46	Equation no 28	4.95
Equation no 32	0.69	Equation no 32	3.98
Equation no 35	1.29	Equation no 35	6.13
Critical value		Critical value	
(1%)	1.48	(1%)	1.89
(5%)	1.32	(5%)	1.57
10%)	1.24	(10%)	1.42

Source: own calculations.

7.5 Estimation Results

As pointed out earlier, estimates will be done of the effect of tariff changes on:

7.3.4 final good imports at the border,

7.3.5 prices of importable goods, and

7.3.6 input costs.

All the equations were estimated by the fixed effects (FE) least squares or least squares dummy variables (LSDV) method by making use of the *EVIEWS* software package.[36]

7.5.1 Tariff changes and import prices at the border

In this case, equation (28) provides the required estimates. Given that some of the variables are non-stationary (see table 15), tests for cointegration amongst the variables were undertaken. The results of the cointegration tests are reported in table 16. Firstly, in terms of the entire model, the null of no cointegration was rejected.[37] Having confirmed the existence of cointegration, an error correction model (ECM) is estimated.

[36] An advantage of using fixed effects estimation is that it allows for intrinsic differences, for example, in the growth of mark-ups (say, due to technological progress or changes in the elasticity of demand) across industries (Chand and Sen, 1998: 8).

[37] Tests for cointegration amongst the regressors were also undertaken and it was found that the null of no cointegration could not be rejected. However, since there was only one I(1) variable (LE) amongst the regressors there was really no need to test for cointegration amongst the regressors. However, the test serves to reinforce the results of no cointegration amongst the regressors.

The methodology employed here is similar to that used in Gagnon and Knetter (1995).[38] The Engle and Yoo (1991) three-step technique includes an additional step to the Engle and Granger (1987) two-step estimation technique. The three-step procedure addresses two specific shortcomings associated with the two-step Engle and Granger estimation procedure, namely:

- The static regression gives consistent (but not fully efficient) estimates of the cointegrating vector, and
- Since the distribution of the estimators of the cointegrating vector provided by the static regression is generally not normal, no inference can be made about the significance of the parameters.

In summary, the three step Engle and Yoo estimation technique involves:

- Step 1 estimates the long-run equation in levels.

  $$LP_{it} = \alpha_1 + \alpha_2 LP_{it}^{w} + \alpha_3 LE_t + \alpha_4 L(1+t_t) + \varepsilon_t$$

  where ε_t is the residual.

- Step 2 estimates an error correction model that takes the form of a dynamic model using the residuals from the long-run equation in step 1 to impose the long-run constraints. This is given by:

  $$\Delta LP_{it} = \beta_1 LP_{it}^{w} + \beta_2 \Delta LE_t + \beta_3 L(1+t_t) + \beta_4 \Delta LP_{i(t-1)} + \beta_5 LP_{i(t-1)}^{w} + \beta_6 \Delta LE_{t-1} + \beta_7 L[1+t_{(t-1)}] + \beta_8 \varepsilon_{t-1} + \mu_t$$

- Step 3 regresses the residuals (μ_t) obtained in step 2 against the regressors $(LP_{it}^{w}, LE_t, L(1+t_t))$ multiplied by the inverse of the coefficient of the residual (- β_8) obtained under step 2. This is given by:

  $$\mu_t = \lambda_1(-\beta_8 LP_{it}^{w}) + \lambda_2(-\beta_8 LE_t) + \lambda_3[-\beta_8 L(1+t_t)] + \upsilon_t$$

  The corrected estimates are calculated as follows:

  - Exchange rate $(\omega_1) = \lambda_2 + \alpha_3$

[38] Gagnon and Knetter (1995) use the Engle and Yoo three step technique to obtain long-run estimates for mark-up adjustment and exchange rate fluctuations for automobile export prices for the USA, Germany and Japan.

- Tariff rate $(\omega_2) = \lambda_3 + \alpha_4$
- World price $(\omega_3) = \lambda_1 + \alpha_2$

The standard errors for the corrected estimates $(\omega_1, \omega_2, \omega_3)$ are given by the standard errors under step three for $\lambda_2, \lambda_3, \lambda_1$ respectively.

The LSDV regression results for equation (28) using the Engle-Yoo three-step procedure are reported in table 18. The first step long-run estimates show that all the coefficients are significant and have the correct signs. In addition, the F-statistic does not raise any concerns about the overall specification of the model while the adjusted R^2 statistic shows that the variables account for approximately 89 percent of the variation in import prices. In the second step, an error correction model (ECM) is estimated that incorporates the lagged dependent and independent variables. The ECM facilitates an investigation of both long-run and short-run dynamic relationships. The coefficient of the error correction term (ECT) measures the short-run adjustments towards the long-run equilibrium position. The coefficient has a value of -0,23 and is highly significant. This suggests that import prices adjust to correct about 23 percent of any disequilibrium in the long-run relationship each year.

Finally, the adjusted coefficients and t-statistics are reflected under step 3. It is these statistics that are of primary importance. All the coefficients have the expected signs and they are all significant. The results indicate that in the long run, the pass-through effect of tariff changes to import prices is around 85 percent, implying that with a 10 percent reduction (increase) in tariffs, import prices decrease (increase) by 8.5 percent. Similarly, approximately 88 percent of world price changes are passed onto domestic currency import prices. The pass-through effect of exchange rate changes is slightly lower at 67 percent.[39]

[39] Given that oil imports are excluded from this estimation it is not surprising that the pass-through effect of exchange rate changes (0.67 percent) for manufacturing imports is slightly lower than those obtained in other recent studies. Nell (2000) obtains an estimate of 0.82 using quarterly data, while Rangasamy and Farrell (2002) obtain an estimate of 0.78 using monthly data for total imports.

Table 18 : Pass-through effects to import prices using the Engle and Yoo three step procedure

Variable	Coefficient	Std. Error	t-Statistic
STEP 1 Long run equation			
Dependent variable $L(P_i)$			
L(E)	0.954	0.026	36.499**
$L(P^w)$	0.241	0.110	2.200**
L(1+T)	0.941	0.247	3.810**
R-squared	0.896		
Adjusted R-squared	0.886		
F-statistic	86.684		
Prob(F-statistic)	0.0		
STEP 2 Error Correction Model	**Coefficient**	**Std. Error**	**t-Statistic**
Dependent variable: $\Delta L(P_i)$			
$\Delta L(E)$	0.112	0.054	2.074**
$L(P^w)$	0.264	0.067	3.940**
L(1+T)	0.631	0.200	3.154**
ECT	-0.228	0.037	-6.058**
$\Delta L[(P_i)(-1)]$	0.328	0.071	4.607**
Δ (LE(-1))	-0.315	0.121	-2.593**
L(1+T(-1))	-0.669	0.201	-3.323**
R-squared	0.581		
Adjusted R-squared	0.493		
F-statistic	4.328		
Prob(F-statistic)	0.0		
STEP 3 Adjusted coefficients	**Coefficient**	**Std. Error**	**t-Statistic**
Dependent variable $L(P_i)$			
L(E)	0.676	0.059	11.517**
$L(P^w)$	0.878	0.250	3.508**
L(1+T)	0.847	0.335	2.526**

Notes: 1. Δ represents the first-difference operator and (-1) indicates a one period lag
2. Industry-specific fixed effects are not reported
3. ** indicates significant at the 5 percent level

Source: Own calculations.

The significance of this result is that the major proportion (around 85 percent) of tariff changes had filtered through to import prices during the 1990s. In the case of South Africa, this means that the major part of the tariff reduction during the 1990s has been passed onto import prices. The question of relevance, however, is whether the reduced import prices had any influence

on the prices charged by domestic industry. This is the focus of the next section.

7.5.2 Tariff changes and prices of import substitutes

In order to ascertain the impact of tariff changes on the prices of import substitutes, equation (31) is estimated which is given by:

$$LP_d = \beta_0 + \beta_1 LP_t^w + \beta_2 LE + \beta_3\ L(1+T) + \beta_4 Lc + \beta_5 Lu + \beta_6 LI + \varepsilon_t$$

Once again, tests for cointegration were conducted but it was found that in terms of the ADF test, the null of no cointegration could not be rejected, but in terms of the Phillips-Perron test the null was rejected (see table 16). Proceeding to estimate an error correction model, it is found that the error term is insignificant which prompts the acceptance of the results of the ADF test of no cointegration.[40] In this case the I(1) variables are differenced and estimated using OLS which gave the results depicted in table 19.

Table 19: Pass-through effects of tariff changes to prices of domestic industry

Variable	Coefficient	Std. Error	t-Statistic
Dependent variable: L(P_d)			
ΔLI	-0.042	0.040	-1.041
LU	0.457	0.029	15.789**
ΔLE	1.046	0.160	6.555**
LP^w	0.660	0.093	7.125**
$L(1+T)$	0.234	0.239	0.981
ΔLC	1.209	0.243	4.979**
R-squared	0.840		
Adjusted R-squared	0.820		
F-statistic	42.571		
Prob(F-statistic)	0.0		

Notes: 1. Δ represents the first-difference operator and (-1) indicates a one period lag
2. Industry-specific fixed effects are not reported
3. ** indicates significant at the 5 percent level

Source: own calculations.

Both R^2 and adjusted R^2 suggest that the identified variables account for over 80 percent of the variation in import prices. All the variables also have

[40] Monte Carlo simulations have shown that the Phillips-Perron nonparametric tests may be less reliable than the ADF tests when there is a predominance of negative autocorrelations in first-differences (Maddala and Kim, 1998: 81).

the expected signs. In the case of the price of import competing goods (P_d), the import tariff variable is now insignificant implying that tariff changes have not exerted any direct influence on the prices charged by domestic industries. It should be noted that the tariff changes referred to in this case refer to the tariff on final goods. What this implies is that pricing behaviour of domestic producers has not been influenced by the tariff liberalisation on final goods. In addition, it is also interesting to note that the rate of growth in import volumes (ΔLI) do not influence the prices charged by domestic producers.[41] In other words, rising imports have not forced domestic producers to reduce prices. This result is somewhat surprising and suggests the possibility that:

- There could be deliberate collusion between importers and domestic producers.[42]
- Alternatively, importers may have increased their profit margins with a result that there was not much increase in (price) competition from imports in the domestic market arising from tariff liberalization.
- It could also be the case that distribution (transport) costs may play a significant role in the retail price of import goods. In this case, it could be that the tariff liberalisation effects were outweighed by increased transport costs. This aspect warrants further research particularly in the light of recent international evidence that transport costs play an important role in the price of tradables.

The coefficient of the exchange rate implies that the rate of change (i.e. appreciation or depreciation) in the exchange rate is completely passed onto domestic prices. In other words, a 10 percent increase in the rate of depreciation (appreciation) results in a 10 percent increase (decrease) in importables prices. This suggests that domestic prices are highly sensitive to exchange rate changes. About 66 percent of world price changes are passed onto the prices of domestic products. In addition, the rate of increase in the

[41] Since the first difference in logarithms is approximately the percentage change in the variable then, dlog(I) refers to the rate of growth in import penetration. The econometric results suggest that the increase in the rate of growth in import penetration during the 1990s has not significantly influenced the prices charged by domestic industry.

[42] It could be the case that high prices are maintained in order to protect the interests of both domestic producers and importers.

general price level (ΔLU) is also a significant determinant of prices charged by domestic industry. This indicates that domestic producers increase their prices as the aggregate price level increases.

For every 10 percent increase in unit costs, domestic prices increases by 4.6 percent. However, as pointed out earlier, tariffs on inputs also influence unit costs. The next section focuses on an estimation of the impact of tariff changes on imported inputs.

7.5.3 Tariff changes and input costs

The estimating equation is given by equation (35) above, namely:

$$Lu = \alpha_0 + \alpha_1 Lu_d + \alpha_2 LP^{wi} + \alpha_3 LE + \alpha_4 L(1+T_i)$$

where T_i = tariff on inputs

In terms of the ADF test the null of no cointegration could not be rejected (see table 7.2). The results are reflected in table 20 below.

Table 20: Tariffs and input costs

Variable	Coefficient	Std. Error	t-Statistic
Dependent variable: Lu			
ΔLE	1.744	0.313	5.569**
LP^w	1.184	0.165	7.194**
$\Delta L(1+T_i)$	1.174	0.581	2.015**
LU_d	0.349	0.050	7.025**
R-squared	0.582		
Adjusted R-squared	0.538		
F-statistic	13.455		
Prob(F-statistic)	0		

** indicates significant at the 5 percent level

Source: Own calculations.

The econometric results indicate that imported input costs have been strongly influenced by changes in world prices, exchange rates and tariff rates. Every 10 percent increase in the rate of tariff liberalisation results in a 12 percent decrease in unit costs. This suggests that tariff liberalisation did have the

intended effects of reducing input costs and improving competitiveness. The exchange rate coefficient implies that a 10 percent increase in the rate of change in the exchange rate resulted in a 17 percent change in input costs. The high pass-through effects of exchange rate changes may be due to expectations about the exchange rate volatility being an important factor in international trade contract pricing.[43] There is also complete pass-through from world prices to domestic input costs. On the other hand, domestic input costs have subdued effects on total input costs with every 10 percent increase (decrease) in domestic input costs resulting in a 4 percent increase (decrease) in total input costs.

Just over 50 percent of the variation in unit costs is captured by the variables. This is on the low side and could be due to the proxy variables used in the estimation not being ideal. In addition, intuition suggests that it is likely that domestic producers have benefited from the tariff liberalisation on imported inputs. This is especially the case given that the producers would have, in all probability, imported the inputs they needed themselves, and hence, would have directly benefited from the tariff liberalisation on inputs. This in effect would have translated into tariff liberalization having resulted in reduced input costs.

7.6 Conclusion

Tariff liberalisation is expected to result in lower prices of import substituting goods, which in turn promotes improved competitiveness. This is due to increased competitive pressures emanating from reduced import prices and reduced input costs. The econometric results in this chapter indicate that tariff liberalisation on intermediate goods did lead to reduced input costs. On the other hand, while tariff liberalisation did lead to a reduction in final goods import prices, it did not increase competitive pressures on domestic industry. In other words, the tradition argument of tariff liberalisation providing the "cold

[43] The exchange rate coefficients for imported intermediate goods (1.74) is higher than that for final importables goods (1.10). One possible explanation could be related to the time lags involved in the trade contracts for these goods. It is possible that there may be a longer time lag between the order and delivery for intermediate goods than in the case for final goods,

winds of competition" necessary for efficiency gains in production has not been fully realized within the South African manufacturing sector during the 1990s.

The next chapter analyses whether manufacturing production manifested any characteristics of improved competitiveness during the 1990s.

and hence expectations surrounding the exchange rate volatility could result in a higher coefficient for imported intermediate inputs.

CHAPTER EIGHT
COMPETITIVENESS AND SECTORAL PRODUCTION

8.1 Introduction

As pointed out in chapter one, the basic justification for South Africa's tariff liberalisation policy during the 1990s was to increase competitiveness. Chapter seven showed that tariff liberalisation in the 1990s:

- reduced imported input costs, and
- reduced import prices at the border but had no significant effect on the price of import substitutes.

Ascertaining the net impact of these results on competitiveness is not straightforward. In the former case, reduced imported input costs positively impacted on competitiveness while, in the latter case, since reduced import prices had no significant price reducing impact on import substitutes, it did not have the desired impact on competitiveness. In addition, it should be borne in mind that reduced price is only one indicator of improved competitiveness.

As pointed out in chapter three, import liberalisation is expected to result in a shift in relative prices, which in turn are expected to result in efficiency gains in production. Hence, probably the most important manifestation of improved competitiveness is on production itself. In this chapter, an analysis of whether tariff liberalisation led to improvements in production efficiency is considered, since the latter is an important determinant of competitiveness. The analysis is undertaken on the basis of the indicators highlighted in chapter three.

The next section briefly considers some of the theoretical issues relating to the analysis in the chapter. The indicators identified in chapter three are also presented in this section. Section 8.3 provides an empirical analysis of the impact of tariff liberalisation on the economic efficiency of manufacturing during the 1990s. The last section concludes.

8.2 Some theoretical issues

Under the assumption of perfect competition, trade liberalisation leads to lower prices of imported goods. This promotes gains for industries and consumers using the imported goods. Increased competition from imported goods force domestic producers of import-competing goods to become more efficient in order to remain competitive. As mentioned in chapter three, under conditions of perfect competition, tariff liberalisation promotes *"static"* and *"dynamic"* efficiency. The expected effects (as identified in chapter 3) include the following:[1]

- *Output growth:* Liberalising sectors should grow faster than non-liberalising sectors. However, it should be noted that liberalisation is expected to shift resources away from unproductive liberalising sectors, and hence, this could result in lower growth rates for these sectors. In this case, it is to be expected that these resources would move to other sectors within the manufacturing sector, and hence, one should expect an increase in output for the manufacturing sector as a whole post liberalisation.
- *Increases in technology intensity:* Since liberalisation promotes technology transfers, this should manifest itself in higher value-added output.
- *Export growth:* Liberalisation is expected to shift production away from import-competing to exporting sectors. As was mentioned previously, even if liberalisation leads to the closure of non-efficient liberalising sectors, one should see a significant rise in manufacturing exports with liberalisation. In addition, as previously argued, liberalisation should promote higher valued (more technology intensive) exports.
- *Productivity gains:* Here one distinguishes between labour productitivy and total factor productivity gains. With technology transfers, even if production moves in line with factor endowments and becomes more labour intensive (as is to be expected for South Africa), there should be an increase in labour productivity with liberalisation. As far as total factor productivity is concerned, liberalising sectors should be

[1] For a review of some of the indicators used in the analysis see UNIDO (2003).

characterised by higher total factor productivity gains relative to non-liberalising sectors.

The above indicators are used to analyse whether tariff liberalisation did promote efficiency (and hence, competitiveness) in the manufacturing sector during the 1990s.

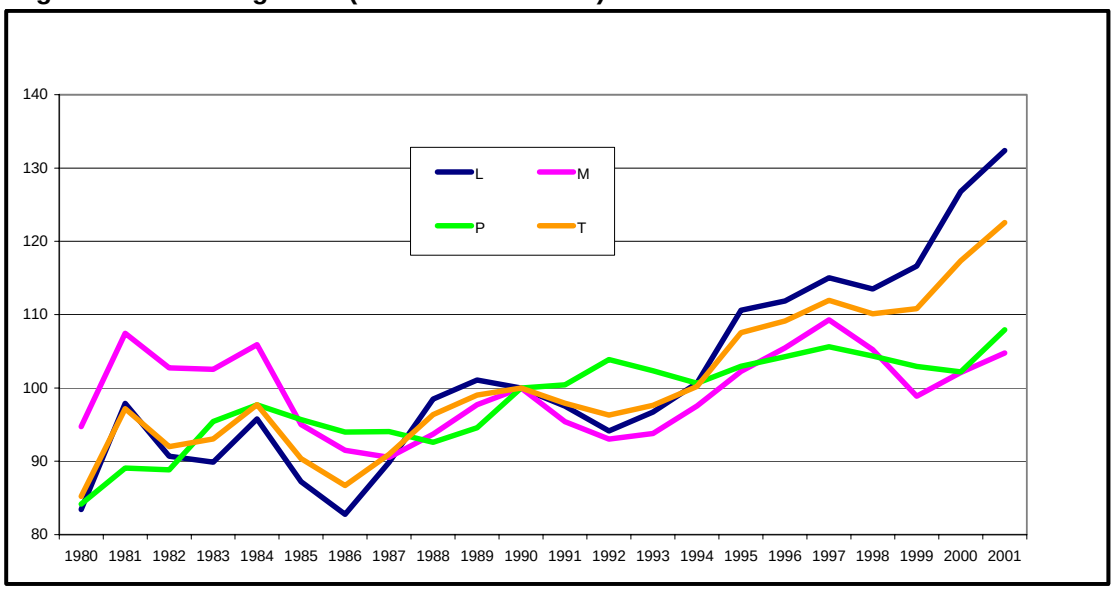
8.3 Tariff liberalisation and manufacturing sector production during the 1990s

The analysis is based on the sectoral classification identified in chapter 4 where the tariff accorded to each sector was used to classify the 28 manufacturing sectors as liberalized (L), moderately protected (M) or increasingly protected (P) during the 1990s.[2]

8.3.1 Tariff liberalisation and manufacturing sector growth

Figure 8 plots the real GDP values (1990=100) for the liberalized, moderately protected and the protected groups of manufacturing sectors for the period 1980 to 2001.

Figure 8: Sectoral growth (real GDP 1990=100)



Source: Own calculations with data from TIPS.

[2] See Table 6 (column 10) in chapter four.

There is an improvement in the performance of all the groups during the 1990s. Economic growth of the more liberalized sectors (L) has exceeded those of the moderately protected (M) and protected (P) sectors, especially after 1994. In addition, from the graph it is evident that the growth of the manufacturing sector is strongly positively correlated with the trade liberalising sectors. This suggests that trade liberalisation may have provided the main stimulant for growth.

However, as pointed out in chapter three, there are a number of factors exerting an influence on growth. Attributing the growth stimulus solely to trade liberalisation requires more justification. There are two aspects worth noting. Firstly, the liberalized sectors and the manufacturing sector as an whole were on an accelerating growth path since the mid 1980s.[3] Secondly, even during the 1990s, the acceleration started in 1992, three to four years before the intense tariff liberalisation was implemented under the WTO offer. It could have been the forces of globalisation following South Africa's formal entry into the world economy (with the end of sanctions) rather than tariff liberalisation *per se* that had a greater impact on the growth performance of the manufacturing sector. However, leaving these concerns aside, one can't but be impressed with the performance of the liberalizing sectors since the early 1990s. Some indication of the impact of tariff liberalisation on the growth trajectory of the liberalizing sectors could be obtained by analyzing some of the other indicators identified above.

8.3.2 Technology intensity and liberalisation

Due to data constraints, manufacturing production was proxied by value of manufacturing sales.[4] A link provided by the DTI is used in the classification of high, medium and low technology products (column 3 in table 21).[5]

[3] Albeit there was a deceleration during 1989-1992.
[4] This refers to manufacturing sales in the domestic and export market.
[5] The classification of production into technology-intensive categories is bound to be contentious. While, the results in the table should be viewed with the usual caution, it does provide an indication of the change in the nature of production.

Table 21: Manufacturing production, technology intensity and protection

SECTOR DESCRIPTION	SIC	Technology[1]	Protection[2]
Slaughtering, processing and preserving of meat	3011	low	P
Processing & preserving of fish & fish products	3012	low	P
Processing & preserving of fruit & vegetables	3013	low	P
Vegetable & animal oils & fats	3014	low	P
Dairy products	3020	low	P
Grain mill products	3031	low	P
Prepared animal feeds	3033	low	P
Bakery products	3041	low	P
Sugar refining	3042	low	P
Cocoa, chocolate & sugar confectionary	3043	low	P
Other food products nec.	3049	low	P
Distilling industries	3051	low	P
Beer, malt liquers & malt	3052	medium	P
Soft drinks & mineral waters	3053	medium	P
Spinning & weaving of textiles	3111	low	P
Made-up textile articles; excl. apparel	3121	medium	P
Carpets, rugs and matting	3122	medium	P
Other textiles nec.	3129	medium	P
Knitted & crocheted fabrics & articles	3130	medium	L
Wearing apparel; excl. fur apparel	3140	medium	L
Tanning and dressing of leather	3160	medium	M
Footwear manufacturing	3170	medium	L
Sawmilling and planing of wood	3210	low	L
Wood and wood products	3220	medium	L
Pulp, paper and paperboard	3231	low	L
Corrugated paper & paperboard	3232	low	L
Other articles of paper & paperboard	3239	low	L
Publishing	3240	medium	M
Printing and related services	3250	medium	M
Coke oven products	3310	low	L
Petroleum refineries & synthesisers	3320	medium	L
Basic chemicals	3341	low	L
Fertilisers and nitrogen compounds	3342	medium	L
Plastics in primary form	3343	low	L
Pesticidesand other agro-chemical products	3351	medium	L
Paints, varnishes, printing ink and mastics	3352	medium	L
Pharmaceuticals, medicinal chemicals, etc.	3353	high	L
Soap, detergents, cleaning & polishing, perfumes, etc.	3354	medium	L
Other chemical products, nec.	3359	medium	L
Tyres & tubes of rubber	3371	medium	M
Other rubber products	3379	medium	M
Plastic products	3380	medium	L
Glass and glass products	3411	medium	L
Ceramics ; Non-structural non-refractory	3421	medium	M
Ceramic products (refractory)	3422	medium	M
Cement, lime and plaster	3424	low	M
Concrete, cement or plaster articles	3425	Low	M
Basic iron and steel	3510	medium	L
Basic precious and non-ferrous metals	3520	low	L
Structural metal products, tanks, reservoirs	3541	low	M
Forging, pressing, stamping, etc. of metal	3551	medium	M
Cutlery, hand tools & general hardware	3553	medium	M
Other fabricated metal products	3559	medium	M
General purpose machinery; office, accounting	3560	medium	L

Table 21: Manufacturing production, technology intensity and protection (continued)

Special purpose machinery	3570	medium	L
Household appliances, nec.	3580	medium	L
Electric motors, generators & transformers	3610	high	L
Electricity distribution & controlling apparatus	3620	high	L
Insulated wire & cable manufacturing	3630	high	L
Accumulators, primary cells & primary batteries	3640	medium	L
Electric lamps & lighting equipment	3650	medium	L
Other electrical equipment, nec.	3660	high	L
Radio, television and communication apparatus	3700	high	L
Medical equipment, instruments and appl	3740	high	L
Motor vehicles	3810	medium	L
Bodies for motor vehicles, trailers & semi-trailers	3820	medium	L
Motor vehicle parts and accessories	3830	medium	L
Other transport equipment, nec.	3840	medium	L
Furniture manufacturing	3910	medium	L
Jewellery and related articles	3921	medium	L
Other manufacturing industries (incl tob products)	3929	medium	L

Notes: 1. Sectors classified according to technology content as high, medium or low
2. Sectors classified as liberalised (L), moderately protected (M) or protected (P) on basis of criteria identified in table 6 (column 10).

Source: Table 6 and own calculations with data from the IDC and DTI.

Table 22: Technology intensity of production

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Liberalised sectors											
% of low value tech prods	18	18	18	17	17	18	19	19	19	20	19
% of medium tech prod	73	74	73	75	74	74	73	73	72	72	73
% of high tech prods	9	9	9	9	9	9	8	9	9	8	8
Moderately protected sectors											
% of low value tech prods	31	32	30	28	29	30	31	31	31	29	28
% of medium tech prod	69	68	70	72	71	70	69	69	69	71	72
% of high tech prods		0	0	0	0	0	0	0	0	0	0
Protected sectors											
% of low value tech prods	80	80	79	80	80	80	81	81	80	79	79
% of medium tech prod	20	20	21	20	20	20	19	19	20	21	21
% of high tech prods	0	0	0	0	0	0	0	0	0	0	0

Source: Table 21, sales data from IDC, own calculations

Table 22 provides an indication of the nature of manufacturing production during the 1990s. In terms of the classification depicted in table 21, it is only the liberalised sectors that produce high technology products. However, their share of production has been fairly constant (around 9 percent) during the 1990s. The same is also true for their production of low and medium technology products.

For the moderately protected sectors, medium technology products dominate production. It increased from around 69 percent in 1990 to around 72 percent in 1993 before falling during the mid 1990s and then increasing again to around 72 percent in 2000. For the protected group, the production shares have been fairly constant (around 80 percent for low technology products and 20 percent for high technology products) for most of the decade. The basic point to emerge from table 22 is that, while there was an increase in the volumes produced (as is evident from figure 8) trade liberalisation has not increased the orientation towards the production of more technology-intensive products during the 1990s. This suggests that technology transfers may not have been facilitated to the extent that one would have expected with the tariff liberalisation of the 1990s.

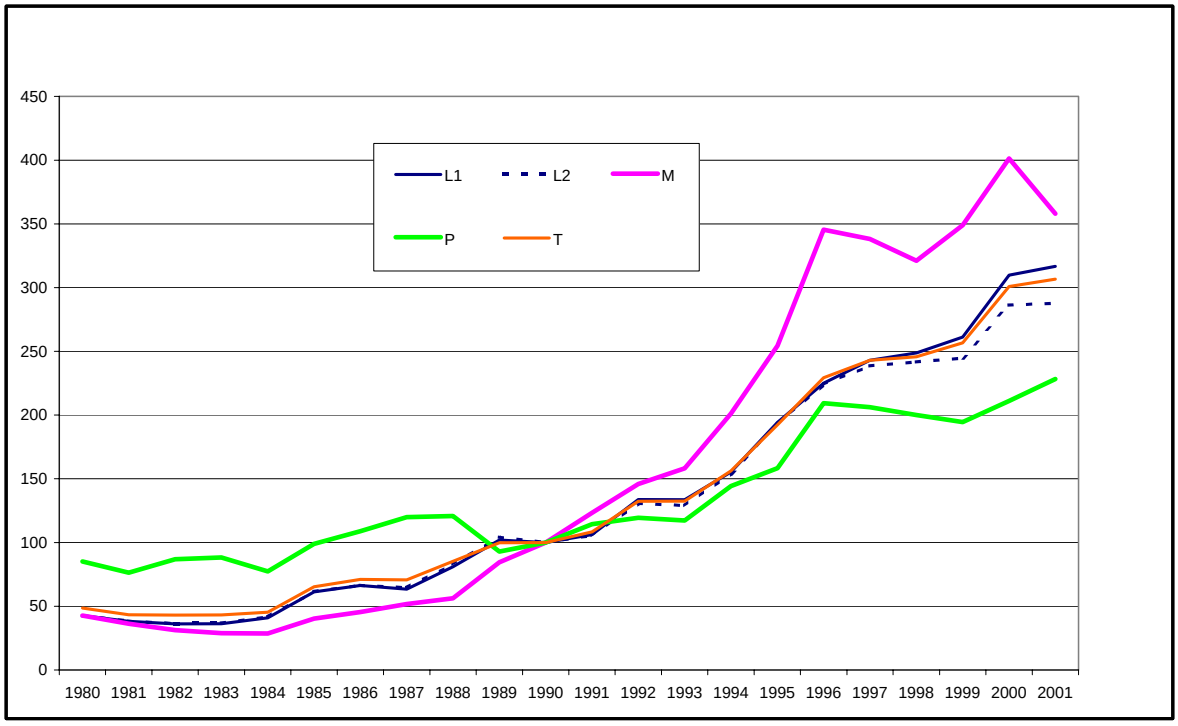
8.3.3 Tariff liberalisation and manufacturing exports

The preceding 2 sections (8.3.1 and 8.3.2) provide an indication of the impact of tariff liberalisation on internal competitiveness. An indicator of external competitiveness is export performance. As mentioned in chapter three, one of the prime motivations for trade liberalisation is to encourage exports. However, increased external competitiveness could be manifested in increased export volumes and/or an increase in value-added exports. The latter aspect is important in the sense that even though export volumes may not be increasing, a move towards more technology-intensive (higher value added) products in the export basket would indicate increased competitiveness.

Figure 9 shows how export volumes have evolved since 1990. The first point that emerges from figure 10 is that exports have increased across all groups during the 1990s. However, it is important to bear in mind that manufacturing exports have been increasing since the mid-1980s. While export production accelerated during the 1990s, the increase started in 1993 (i.e. before the implementation of the WTO offer). Secondly, while the liberalized sectors (L1) have experienced a rapid increase in exports during the 1990s, it was surpassed by the performance of the moderately protected sectors. If one excludes the exports of motor vehicles, the export performance of the

liberalized sectors (L2) becomes less attractive.[6] Since the late 1980s there has been a significant increase in export volumes of the moderately protected sectors. *Ceteris paribus*, figure 10 provides a strong case for moderate protection as a means of increasing exports.

Figure 9: Real exports (1990=100)



Source: Own calculations with data from TIPS.

As far as the increase in export volumes are concerned, the results presented here confirm those obtained in earlier studies (Tsikata, 1999, Golub, 2000, Fedderke, 2001: 27); however, unlike these studies, there is no clear indication that trade liberalisation was the main stimulant to export production.[7] In addition, while trade liberalisation has not been de-industrialising, export production has specialized in products that are stagnating in world markets (Tsikata, 1999) which raises further concerns

[6] A strong argument could be made for the case that the Motor Industries Development Programme (MIDP) is a classic example of targeted protection and is heavily dependent on tariff rebates. It is highly debatable whether the impressive export performance of the motor vehicle industry is sustainable, particularly if the tariff rebates currently available under the MIDP are withdrawn (the EU-SA FTA requires that the MIDP and particularly the tariff rebates be reviewed). An analysis of this aspect is beyond the scope of this chapter.

[7] See Roberts (2000) for some further evidence in this regard.

about export production during the 1990s. The impact of tariff liberalisation on export production is thus still very much an open question.

Did tariff liberalisation exert any influence on the nature of export production during the 1990s? In order to answer this question one can consider how the composition of exports of the three categories has changed during the 1990s. This information is reflected in table 23.

Table 23: Manufacturing exports

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Liberalised sectors											
% of low value tech prods	37	37	34	32	31	33	32	31	32	29	27
% of medium tech prod	60	60	61	62	60	58	59	61	59	62	66
% of high tech prods	3	3	5	9	9	9	9	9	9	9	7
Moderately protected sectors											
% of low value tech prods	27	30	40	40	39	40	32	41	39	45	40
% of medium tech prod	73	70	60	60	61	60	68	59	61	55	60
% of high tech prods	0	0	0	0	0	0	0	0	0	0	0
Protected sectors											
% of low value tech prods	95	92	89	90	89	90	89	88	90	88	88
% of medium tech prod	5	8	11	10	11	10	11	12	10	12	12
% of high tech prods	0	0	0	0	0	0	0	0	0	0	0

Source: Own calculations with data from IDC and DTI.

While the liberalised sectors have increased their exports of high technology products, the ratio has been fairly constant at around 9 percent since 1993 - some two years before the implementation of the WTO offer.[8] The exports of medium technology products, on the other hand, have increased to around 66 percent of total production in 2000.[9] For the moderately protected sectors there has been an increase in the export of low technology exports over the period. The protected sectors have, on the other hand, more than doubled their share of low technology exports from around 5 percent to 12 percent during the period. Viewing export performance within the context of the trade liberalisation programme presents mixed results. However, the results considered here do not reveal any strong correlation between liberalisation and improved export performance. These aspects warrant more specific research at a disaggregate product level.[10]

[8] The ratio decreased to 7 percent in 2000. It remains to be seen whether this is a temporary occurrence following the Asian financial crisis in 1998-99.

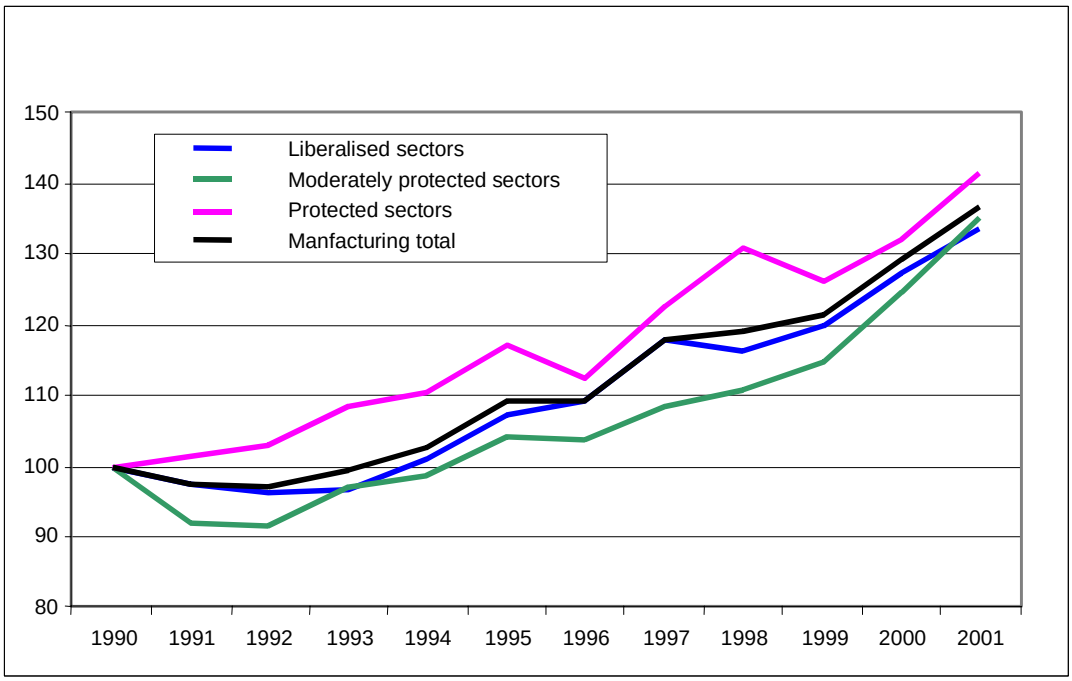
[9] However, the increase occurred in 2000 with the average for the period being around 61 percent. It is still to be ascertained if the increase is sustainable.

[10] The classification employed here categorised the 4-digit SIC sectors into high, medium and low technology sectors. This makes the assumption that all products produced within this 4

8.3.4 The impact of liberalisation on productivity

As mentioned above, one could have expected tariff liberalisation to have influenced both labour and total factor productivity trends during the 1990s. Figure 10 depicts the trends in labour productivity of the three groups over the 1990s.

Figure 10: Real value added per employee (1990=100)



Source: Own calculations with data from TIPS.

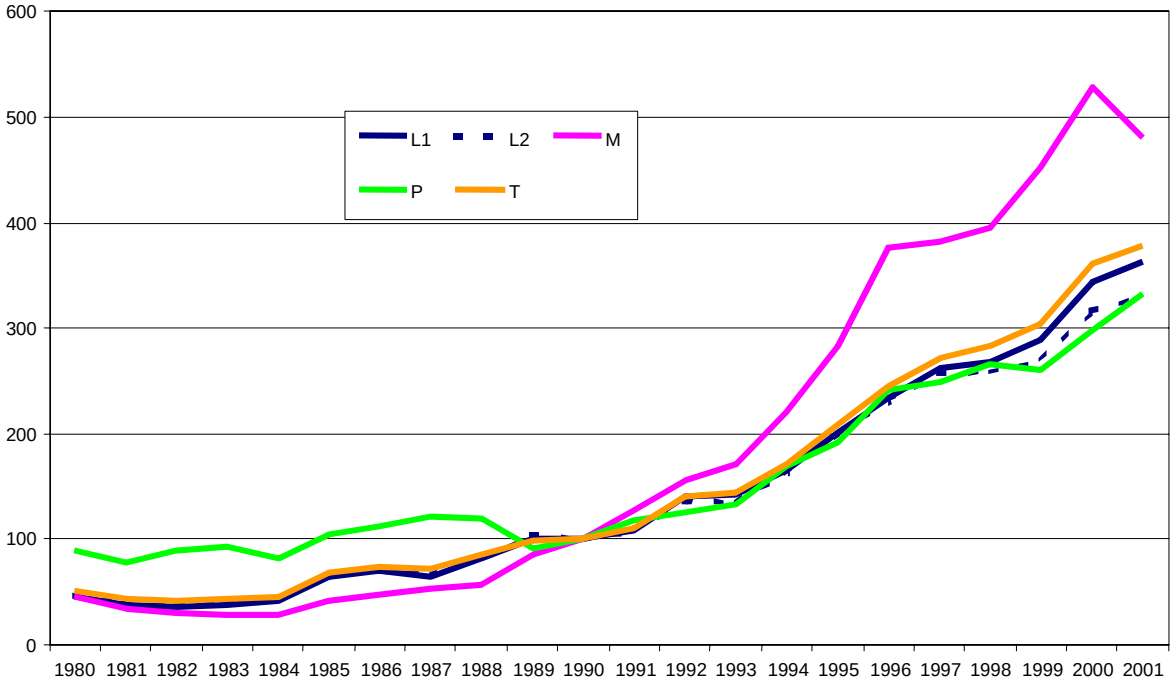
Real value added per employee for the protected sectors has accelerated at a faster pace than those of the other groups for the entire decade. On the other hand, real value added per employee of the liberalised sector has kept pace with the average for the manufacturing sector. The growth in real value added for the moderately protected sectors lagged behind that of the liberalised and protected groups for the entire decade. Using real value added per capita as an indicator of the labour productivity, the trends during the 1990s do not provide any conclusive evidence that trade liberalisation was associated with productivity improvements during the 1990s. If anything, it would seem that on

digit SIC industry classification uses the same (similar) technology. This is obviously unrealistic; the ideal would be to categorise the individual products produced by the sectors. However, data constraints precluded this calculation.

the basis of real value added per capita, protection is necessary for improved industrial competitiveness.

A similar result emerges when one considers export production.

Figure 11: Real exports per employee (1990=100)



Source: Own calculations with data from TIPS.

Figure 11 indicates that labour productivity has been on the increase since the mid-1980s. Once again the moderately protected sectors produced a higher volume of exports per employee compared to the other groups. Interestingly, labour productivity in the liberalised (L1, L2) and protected (P) groups tracked each other very closely. These results suggest that tariff liberalisation may have played a role - albeit a limited one - in stimulating labour productivity during the 1990s. However, labour productivity ratios should be viewed with some caution they are sensitive to changes in the capital-labour ratio and thus may provide misleading indications of the changes in efficiency and competitiveness. For this reason, total factor productivity measures are more reliable indicators of efficiency since it captures the efficiency of *all* factor inputs.

Table 24 shows the average annual contribution of total factor productivity to the economic growth of manufacturing sub-sectors for the 1980s and 1990s.[11]

Table 24: Total factor productivity for manufacturing sub-sectors

	Sector	1980s	1990s
1	Basic chemicals	-4.1	2.7
2	Basic iron & steel	0.2	3.0
3	Basic non-ferrous metals	1.4	-1.9
4	Coke & refined petroleum products	12.0	-4.2
5	Electrical equipment	-3.6	0.1
6	Footwear	-1.1	-0.4
7	Furniture	3.1	-3.9
8	Glass & glass products	2.9	-2.9
9	Machinery & equipment	-4.8	2.6
10	Motor vehicles, parts & accessories	3.6	-5.0
11	Other chemicals & man-made fibres	-0.2	0.1
12	Other industries	14.6	-0.8
13	Other transport equipment	-3.5	-4.2
14	Paper & paper products	-1.1	-1.4
15	Plastic products	3.7	-2.4
16	Professional & scientific equip	7.7	0.5
17	TV, radio & communication equip	10.0	-6.5
18	Wearing apparel	1.7	1.7
19	Wood & wood products	-0.7	0.9
20	Leather & leather products	2.8	0.6
21	Metal products excluding machinery	-0.6	-0.1
22	Non-metallic minerals	-1.5	0.4
23	Printing, publish & recorded media	2.9	-4.0
24	Rubber products	2.5	-2.8
25	Beverages	1.8	-5.1
26	Food	-2.0	0.1
27	Textiles	-1.1	-0.2
28	Tobacco	1.7	0.0

Source: Fedderke, J.W. 2002. The structure of growth in the South African economy: Factor accumulation and total factor productivity growth, 1970-97. *SAJE.*

It is widely accepted that total factor productivity (TFP) is an important determinant of growth but its measurement has been the subject of much controversy in the academic literature (Hulten, 2000).[12] Hence, some caution should be exercised in interpreting the TFP measures provided in table 24.[13]

[11] The average for the 1990s covers the period 1990-97.

[12] For a discussion of some of the difficulties within the South African context, see Fine (1992) for an application to the coal mining industry and Fedderke (2002) for a more general application to the manufacturing industry.

[13] For example, as Fedderke (2002: 621) notes, apart from the usual criticisms associated with the determination of TFP based on the Solow residual, the use of net output tends to bias the sectoral TFP estimates upwards.

Given these limitations the purpose here is to obtain some broad indications of whether tariff liberalising sectors have experienced TFP gains.

In table 24, column 3 (column 4) depicts the annual average contribution of TFP to output growth for different manufacturing sub-sectors for the 1980s (1990s). This indicates that TFP played a limited role in the growth performance of the manufacturing sector during the 1990s. However, six sub-sectors (basic chemicals; basic iron and steel; electrical equipment; machinery and equipment; other chemical and man made fibres; wood and wood products) of the liberalising group (rows 1-19) have experienced higher contributions from TFP to economic growth. On the other hand, the moderately protected sub-sectors (rows 20-24) and protected sub-sectors (rows 25-28), four sectors (metal products excluding machinery; non-metallic aminerals; food, textiles) experienced improvements, while the remaining five sub-sectors (leather and leather products; printing, publishing and recorded media; rubber products; beverages and tobacco) experienced declines in total productivity levels in the 1990s as compared to the 1980s.[14] While the results in table 24 provide some evidence, it is not conclusively in favour of tariff liberalisation having promoted TFP gains in the manufacturing sector during the 1990s. Empirical evidence reveals that the growth of the manufacturing sector has become more reliant on capital accumulation.[15]

The basic conclusion is that there is no distinct positive difference in productivity trends in liberalising sectors as compared to the other sectors. This once again raises some concerns about the impact of tariff liberalisation on the competitiveness of the manufacturing sector during the 1990s.

8.4 Tariff liberalisation and imports

The analysis presented thus far, implies that tariff liberalisation exerted a limited impact on the production of the manufacturing sector. This suggests

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[14] It should be noted that the improvements in some cases involve a smaller decline in productivity levels during the 1990s as compared to the 1980s.
[15] see Fedderke (2002).

that the tariff liberalisation of the 1990s did not succeed in increasing competition in the domestic economy. An indication of whether this was the case can be ascertained by considering the import penetration ratios of the different sectors. The import penetration ratio, calculated as imports as a ratio of domestic demand, for the 28 manufacturing sectors is reflected in table 25.

Table 25: Import Penetration ratios

Sectors	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Average (1990-94)	Average (1995-01)
1 Wearing apparel [313-315]	5	7	7	8	8	6	9	10	12	12	16	18	7	12
2 Footwear [317]	4	8	12	16	16	19	26	26	28	31	38	46	11	31
3 Wood and wood products [321-322]	9	9	9	12	11	11	12	11	11	11	13	13	10	12
4 Paper and paper products [323]	11	10	10	11	13	15	15	13	14	14	13	13	11	14
5 Coke and refined petroleum products [331-333]	8	7	7	6	6	7	14	11	15	12	11	16	7	12
6 Basic chemicals [334]	33	35	39	42	46	50	50	47	47	44	48	48	39	48
7 Other chemicals and man-made fibers [335-336]	17	17	18	19	21	22	25	25	28	29	32	34	18	28
8 Plastic products [338]	7	7	7	9	9	9	10	11	12	13	14	15	8	12
9 Glass and glass products [341]	13	14	16	18	17	18	22	23	27	26	27	24	15	24
10 Basic iron and steel [351]	9	8	10	9	11	12	14	12	15	14	13	13	9	13
11 Basic non-ferrous metals [352]	22	20	19	20	20	28	31	28	45	31	49	24	20	34
12 Machinery and equipment [356-359]	45	44	47	50	58	62	66	66	71	72	78	89	49	72
13 lectrical machinery and apparatus [361-366]	23	23	23	26	31	33	30	29	34	33	34	39	25	33
14 Television, radio and communication equipment [371-373]	33	39	41	47	58	65	74	77	82	81	86	85	44	79
15 Professional and scientific equipment [374-376]	77	75	73	76	76	79	84	87	94	92	94	95	76	89
16 Motor vehicles, parts and accessories [381-383]	26	23	24	27	29	29	31	29	32	34	37	39	26	33
17 Other transport equipment [384-387]	28	51	58	61	54	65	54	95	85	90	92	93	51	82
18 Furniture [391]	2	2	3	3	4	5	9	8	10	13	15	20	3	11
19 Other manufacturing [392-393]	39	41	44	44	51	49	53	51	57	55	58	61	44	55
20 Leather and leather products [316]	17	20	22	25	31	28	32	32	31	28	33	32	23	31
21 Metal products excluding machinery [353-355]	9	9	9	10	10	11	12	12	14	15	15	16	9	13
22 Non-metallic minerals [342]	8	7	8	9	10	11	13	13	15	18	19	20	8	16
23 Printing, publishing and recorded media [324-326]	15	16	14	16	18	18	23	18	20	19	20	21	16	20
24 Rubber products [337]	14	16	17	18	20	23	26	28	32	34	34	34	17	30
25 Beverages [305]	4	3	3	3	3	3	5	5	5	5	4	4	3	5
26 Food [301-304]	5	4	5	5	8	9	9	10	10	9	10	10	5	9
27 Textiles [311-312]	18	21	20	20	22	23	24	24	26	26	27	28	20	26
28 Tobacco [306]	2	3	3	2	2	2	2	1	2	2	1	1	2	2

Notes: Liberalising sectors (1-19), moderately protected sectors (20-24), protected sectors (25-28)

Source: Own calculations with data from TIPS.

With the exception of the tobacco sector this ratio has increased for all of the 27 other manufacturing sectors. Rising imports were not only confined to those sectors undergoing extensive or even moderate tariff liberalisation. It is therefore not surprising that there are very limited differences (as pointed out in the preceding sections) in those sectors subjected to extensive tariff liberalisation relative to those sectors subjected to moderate or no protection. Thus, it may have been the ending of sanctions and the globalisation of the South African economy rather than the effects of tariff liberalisation *per se* that exerted the most significant impact on manufacturing production in the 1990s.

8.5 Conclusion

Theory dictates that improved competitiveness has a direct impact on production. Higher growth rates and the production and export of more value-added (technology-intensive) products depict improved competitiveness. If tariff liberalisation did promote competitiveness in the manufacturing sector during the 1990s, then these effects would have explicitly characterised those sectors undergoing extensive tariff liberalisation. The results in this chapter do not bear this out. This warrants further investigation particularly at the disaggregated sectorial level. Some policy conclusions and recommendations are made in the next chapter.

CHAPTER NINE
SUMMARY AND POLICY RECOMMENDATIONS

9.1 Summary

As mentioned in chapter one, tariff liberalisation was one of the main policy instruments underpinning South African trade policy during the 1990s. The primary objective of the tariff liberalisation programme was to increase the competitiveness of the manufacturing sector. This study attempted to ascertain if this objective was met. This was done by testing the hypothesis that South Africa's tariff liberalisation policy in the 1990s has contributed to improved competitiveness of the manufacturing sector.

In chapter two, an analysis of trade theory and it's implications for competitiveness was undertaken. The point of departure in this chapter was that competitiveness is dependent on production being in conformity with a country's comparative advantage situation. Within this context, traditional trade theory based on conditions of perfect competition make two fundamental claims. Firstly, comparative advantage is based on factor endowments. Secondly, "free trade" or *"laissez-faire"* policies are needed to secure production according to a country's factor endowments. The policy implications for competitiveness are firstly, optimal policy involves minimal government intervention. Secondly, production that is not in line with a country's factor endowments is an outcome of trade distorting government policies. This implies that improved competitiveness is dependent on a move towards *"market friendly"* policies. However, new trade theory based on conditions of imperfect competition has shown that comparative advantage is not solely based on factor endowments. This in essence means that in certain circumstances, and more particularly for developing countries, there may be an important role for government policy to influence the comparative advantage pattern of a country.

Against this background, chapter three analysed the role of protection in industrial policy. More specifically, in keeping with the objective of this study,

the chapter appraised the relationship between trade liberalisation and economic growth. It was shown that this relationship is ambiguous both from a theoretical and empirical standpoint. The empirical evidence on the tariff-growth relationship was found to yield similar results. The lack of a robust relationship between tariff liberalisation and economic growth means that trade policy effects are "country" and "industry" specific. This provides some justification for this study, which attempts to analyse a particular aspect of the tariff-growth relationship, namely, the impact of tariff liberalisation on the price competitiveness of the manufacturing sector.

It has been acknowledged in the empirical work that South Africa's tariff liberalisation during the 1990s was extensive. This conclusion, has in the main, been based on a descriptive analysis of South Africa's WTO offer in the mid-1990s. However recently, effective rate of protection (ERP) calculations have been used to contest the extent of tariff liberalisation during the 1990s (Feddereke and Vaze, 2001). Employing a similar methodology, chapter four shows that the 1990s was indeed characterised by extensive tariff liberalisation.

Much of the empirical work on South Africa's trade policy has been undertaken within a two-sector (exportables and importables) model. Within this model, any trade incentive for one sector (importables) is at the expense of the other sector (exportables); this is captured in the conventional anti-export bias measure of protection. However, within a three-sector (exportable, importable and non-tradable) model the conventional measure of anti-export bias is called into question. In chapter five, it was shown that the empirical work to date has exaggerated the extent of anti-export bias during the 1990s.

One of the traditional measures of competitiveness is the real exchange rate (RER). Chapter six used a variant of the conventional RER measure (which differentiates the tradable sector into both exportables and importables), to show that tariff liberalisation had a limited impact on the competitiveness of the manufacturing sector.

In chapter seven, a more thorough econometric analysis was used to appraise the results obtained in chapter six. Tariff liberalisation was expected to increase competitive pressures on domestic industry. It was found that tariff liberalisation led to reduced imported input costs. However, as far as final goods imports are concerned, it was found that while tariff liberalisation led to reduced import prices at the border, it did not exert any significant influence on the price of import substitutes. This, in effect, meant that tariff liberalisation had a limited impact on improved competitiveness of the manufacturing sector. These results complemented those reached in chapter six.

Reduced price is one dimension of competitiveness. Chapter eight considered other indicators of competitiveness, namely, output and export growth, the nature of products produced and exported, and productivity gains. An analysis of these indicators reveals that there are very little positive differences between the liberalising and non-liberalising sectors. This once again casts some doubt over the impact of tariff liberalisation on improved competitiveness.

The main conclusion of this study is that the tariff liberalisation policy of the 1990s had a limited impact on improving competitiveness within the manufacturing sector. The next section considers some policy implications of this conclusion.

9.2 Policy implications

The government's commitment to it's liberalisation programme cannot be doubted. This is evident by the pace of tariff liberalisation, which in some cases, went beyond the requirements specified in South Africa's WTO offer (Bell, 1997). Thus, the limited impact of tariff liberalisation on the competitiveness of the manufacturing sector cannot be blamed on the extent of the tariff liberalisation undertaken during the 1990s. Recently, government released a policy document entitled *"Accelerating growth and development: The contribution of an integrated manufacturing strategy"* (hereafter referred to as IDS) (DTI, 2002). The policy document outlines government initiatives pertaining to the development of the manufacturing sector. The

recommendations mentioned hereafter are done with reference to the IDS policy document.

It should be categorically pointed out that while this study has shown that tariff liberalisation did not have the expected impact on the competitiveness of the manufacturing sector, it does not mean that increased protection would secure better results. In fact, there are strong theoretical justifications (as was pointed out in chapter three) for tariff reductions on economic efficiency grounds. The benefits from tariff liberalisation are dependent on prevailing market conditions. Under conditions of perfect competition it is not unreasonable to assume that tariff liberalisation would promote competitiveness. On the other hand, under conditions of imperfect competition, the results are ambiguous. The results in chapter seven of this study has shown that while tariff liberalisation had an impact on the price of imports at the border, it did not have any significant influence on the domestic price of import substitutes. These results are in line with those obtained in other recent studies (Fedderke and Schaling, 2000; Fedderke, 2001: 28) which show that pricing power has adversely affected competitive pressures in output markets. This suggest that there is room for improving the role of competition policy in creating the environment conducive for improved competitiveness.

There are indications that concentration in South African manufacturing is not only high but also on the increase (Fourie, 1996).[1] The fundamental objective should be to ensure that where market dominance may be necessary (e.g. to ensure economies of scale in production) it should not result in abuse of economic power. In order to improve competitiveness, competition policy and trade policy should be better co-ordinated. According to Fourie and Smith (1993: 131) *"…there are sufficient empirical grounds for suspecting a significant interaction between concentration and import protection in the determination of industrial profitability".* The results presented in chapter

[1] Although he argues that the concentration ratios are not increasing at an "*alarmist*" rate.

seven of this study suggest that this aspect warrants further research, particularly at the disaggregate sectoral level.[2]

Given that increased entry does not necessarily lead to better performance (Nickell, 1996; World Bank, 2002; Aw, et al, 2002) it is imperative that competition policy goes beyond just the mere facilitation of increased entry. While competition policy should address the overall developmental concerns of the country (Singh, 2002), it should also be sufficiently flexible to cater for the specific needs of individual sectors. The proposed measures specified in the IDS pertaining to the regulatory business environment for the manufacturing sector is an important first step in improving competitiveness trends in the future.[3] In addition, industrial competitiveness depends not only on improved efficiency but also on improved capabilities (Lall, 1990). The former requires increased competition while the latter may require some protection. Competition policy should be sensitive to prevailing conditions confronted by the different industries.[4] The East Asian experience, for example, has shown that successful industrial policy depends on the exploitation of economies of scale in production and linkages between sectors. Competition policy should be of such a nature that it facilitates this process.

The recent IDS recognises the importance of linkages between sectors. It emphasizes the importance of "integrated value matrices" for the establishment of competitive manufacturing capabilities (DTI, 2002). Viewing production as a value chain process implies that the end producer, together with all the other producers involved with the inputs used in the final product, also contribute to the competitiveness of the product. Viewed in this way, the

[2] A disaggregate analysis would allow for the development of appropriate policies that could address the needs or problems at the industry or sub-industry level.

[3] The IDS proposes a reform of the regulatory environment which would entail *"… corporate law reform, formulation of modern consumer protection legislation, improved international trade administration, promotion of good corporate governance, establishment of standards-quality assurance-and-trade metrology institutional framework and the development and implementation of appropriate policies for regulated industries and related public interest issues"* (DTI, 2002: 46).

[4] see Stewart et al, 1992 for a discussion of the relevant issues within a developing country context

issue of governance over the chain becomes one of the key issues affecting competitiveness since governance determines, *"…the division of rents from the operation of the chain as a whole, as well as, the dynamic evolution of the chain through new product development"* (Roberts, 2002: 15). The role of government is to facilitate an appropriate economic environment that promotes industrial competitiveness. In practice this entails ensuring that the incentives, factor markets and institutions all work together to promote competitiveness (UNIDO, 2003: 93).

It is widely accepted that institutions play an important role in economic development (North, 1990; Acemoglu, et al, 2001). Their influence stem primarily from their ability to *"…create incentives for desirable economic behaviour"* (Rodrik and Subramanian, 2003: 31). In the case of South Africa, there are a variety of institutions having an influence on industrial performance. These include, *inter alia,* the Industrial Development Corporation, National Empowerment Fund, Khula Enterprise Finance, Competition Commission, Competition Tribunal, South African Bureau of Standards, South African National Accreditation System, Ntsika Enterprise Promotion Agency, Council for Scientific and Industrial Research, National Co-ordinating office for manufacturing Advisory Centres and Sector Co-ordinating and Training authorities (SETAs). Industrial success depends on the co-ordination of the priorities and activities of these institutions. While sectorial or industrial policies may be in line with the country's overall objectives, industrial success depends on the accessibility and effect that policy has on individual firms. The manufacturing advisory centres (MACs), for example, have been established *"…to contribute significantly to the economic transformation of South Africa by supplying high-quality information and advisory services to SMMEs so as to ensure a quantum improvement in their growth and competitiveness"* (DTI, 2003: 3). However, the results to date indicate that while the programme has laudable intentions, its success has been somewhat limited, since other factors (e.g. access to finance, technological know-how, etc.) that have a direct impact on industrial competitiveness, have not been adequately addressed. There is an urgent

need to co-ordinate the initiatives of all the above mentioned institutions if programmes like the MACs are to produce the desired results.

In terms of the new institutional arrangements specified in the IDS, South African trade policy is to be co-ordinated by the Commission for International Trade Administration (CITA). CITA would be responsible for the administration of trade policy for the South African Customs Union (SACU). This in effect, requires that the national interests of South Africa would have to be balanced with those of the SACU countries. While agreement has been reached on the sharing of the tariff revenue, CITA will have to ensure that the customs procedures and institutional arrangements in the different countries are streamlined and synchronised so that industrial policy is not compromised across the SACU countries.

Industrial competitiveness is a multi-faceted construct, which goes beyond merely ensuring that production is efficient. Other factors like non-tariff barriers (e.g. labelling requirements, customs procedures and documents, etc.) to trade have a direct impact on a country's international trade performance. This issue is of particular relevance in the 21st century, which is being characterised by increasing levels of globalisation. South Africa has, in some respects, embraced globalisation with a view to benefiting from increased and improved international economic relations. Broadly speaking, the South African approach started off being multilateral (as in the GATT offer in 1994) and has since become more bilateral in nature. The bilateral agreements have taken the form of free trade agreements (FTAs) - some of which have already been concluded (e.g. with the SADC and the EU) and others that are in discussion (e.g. with the US, the Mercosur countries in Latin America, India and China). The FTA is a useful means of improving the competitiveness of South African products by securing privileged access to foreign markets, as well as, access to foreign investment and technology transfer initiatives that may not be easily available within a multilateral context; for example, in the case of the EU-SA FTA, a specific science and technology agreement was also signed to allow for co-operation on technological issues). While the FTA approach as a means of stimulating exports should be

welcome, it is imperative that government ensures that the perceived benefits from the FTAs actually do materialize. The experience to date shows that government resources have been mainly directed at the negotiations of these agreements, while not much attention is given to ensuring that the perceived benefits are realized after the agreement has been signed.[5]

As far as factor markets are concerned, competitiveness is highly dependent on improved industrial capabilities. According to Lall (1990), industrial capabilities include physical investment, the provision of human capital and technological effort. The importance of all these factors has been recognized in the recent IDS policy document (see DTI, 2002: 27-29). However, concrete programmes still have to be developed to explicitly address these issues.

Finally, there is little disagreement with government's recent assertion that there is a need to "…*accelerate the current trajectory of our economy…Old ways of thinking and working are no longer appropriate. A concerted effort is therefore required by government and all other economic actors to address these constraints and place the economy on a path that can achieve high growth, employment and equity"* (DTI, 2002: 1-2).

The results in this study have shown that tariff liberalisation on its own has not, and cannot be relied upon in the future to secure improved competitiveness. A competitive environment characterizes the globalised world of the 21st century. The WTO is increasingly placing limitations on the use of conventional policy instruments to support industrialization. This, in effect, means that developing countries need to adopt a wider interpretation of industrial policy and the instruments to be used in supporting industrial development (Singh, 1996). In general, government polices should be directed at issues relating to efficiency in production, distortions in factor

[5] The results from the EU-SA FTA indicate that policymakers did not give sufficient attention to marketing the benefits of the agreement, as well as, setting up the necessary institutional arrangements (e.g. customs procedures and institutions to deal with rules of origin requirements) to ensure the realisation of the benefits (Rangasamy, 2001).

markets and institutional development.[6] It should be remembered that both theory and empirical evidence suggest that where deficient markets give distorted signals, intervention may be necessary to restore efficiency. The desired or appropriate level of openness may not entail completely free markets for trade and investment. In the light of market and institutional failures facing the acquisition of new technologies (UNIDO, 2003: 142), the role of government in promoting the appropriate trade and industrial policy should not be underestimated.[7]

[6] See Bora, et. al (1999) for a discussion on the impact of WTO rules on industrial policy within a developing country context.

[7] The optimal level of trade openness and trade liberalisation remains a matter of debate (see Rodrik, 2001; Lall, 2001b).

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