THE DIRECTION OF TRADE AND ITS IMPLICATIONS FOR LABOUR IN SOUTH AFRICA

A thesis submitted in fulfilment of the requirements for the degree of

MASTER OF ARTS

at

RHODES UNIVERSITY

by

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June 2005

ACKNOWLEDGEMENTS

I would like to thank the following people for their personal help in completing this work:

Magdalene K. Wilson, Supervisor (Department of Economics and Economic History, Rhodes University)

Jen Snowball, Co-Supervisor (Department of Economics and Economic History, Rhodes University)

Niki Cattaneo (Department of Economics and Economic History, Rhodes University)

Mr. Gena Krasnic (International Development Corporation, Cape Town)

Mr. Lawrence Edwards (University of Cape Town)

Mr. Jean Pierre Fouche` (SharpIT, Grahamstown)

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

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June 2005

ABSTRACT

This aim of this thesis is to analyse the demand for labour from trade with a selection of South Africa's trading partners. It is expected that labour demand will be greater in trade with developed blocs. Trade between developing blocs, however, is thought to be more skilled labour intensive and such trade should have greater linkages. This ought to feed through into greater labour demand so that South-South trade may be more 'labour creating' than expected. As it is more skill intensive, it may also be more dynamic, which has implications for future growth and development.

Factor content methodology is used to assess labour demand. Calculations consider linkages to other sectors (which will increase labour demand) and the use of scarce resources (which has an opportunity cost to labour). The findings support the claim that trade with developing blocs is more professional labour intensive. Evidence that it may be more dynamic and have greater linkages to labour is borne out in exports to SADC. Greater labour demand through linkages, however, is not evident in net trade to SADC. Neither are they of significance in trade with any of the other developing blocs so labour effects due to linkages appear to be negligible. The advantages of South-South trade may rather lie in the dynamic benefits that trade in higher technology goods provides.

When scarce resources such as capital and professional labour are taken into account, it is found that labour demand is negative in net trade to all blocs. However, even without the problem of scarce resources, most blocs have a negative demand for labour in net trade. The indication is that with the present trade patterns, South Africa cannot expect trade to increase labour demand. Policy which could improve this situation would be to increase labour force skills, improve the flexibility of the labour market and develop sectors which are both more advanced as well as labour intensive. Despite the negative impact of trade on labour in general, it is found that trade does differ by direction and that for each labour type there are certain blocs where labour demand is positive. This is also the case in net trade for particular sectors. Such information could be used as part of a targeted trade policy to assist in the marketing of particular sectors in trade and also for increasing labour demand for certain labour groups.

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INTRODUCTION

The current and contentious view on trade set out by the Washington Consensus has dominated trade policy in many developing countries over the last few decades. This view is that the fastest way for a nation to develop is to open up its markets to global trade, reduce trade barriers, attain macroeconomic stability and 'get the prices right' (Stiglitz, 1998:1). South Africa has followed this ideology in its trade policy. Since the implementation of the Uruguay Round trade agreement in January 1995, South Africa has undertaken substantial trade reforms in an effort to further the process of trade liberalisation, which began in 1983 (Bell and Cattaneo, 1997:1).

While traditional trade theory shows that free trade is mutually beneficial for the trading partners concerned and a move towards free trade is prudent, it should also be noted that trade is not uniform in nature. A country's trade varies according to its trading partners and as Krueger (1977) argues, the characteristics of a country's trade may depend heavily on what group of trading partners is being considered. It is because of these differences that it is important to analyse trade by direction and assess the implications this has for the economy and for labour (Havrylyshyn, 1987:34). This is especially appropriate when trade varies as significantly between partners as it does in South Africa. These differences have implications for the proportions of each labour type used in trade. In South Africa, factor intensities vary widely across sectors (Lewis, 2001:79). As trade to different trading partners embodies varying proportions of goods from diverse sectors, trade to each partner will embody varying factor intensities. This will impact directly on growth and job creation (Samson *et al*, 2001:3). It is important to assess how the demand for different labour groups is affected through trade to various partners, especially in light of the excessively large and growing unemployment problem (particularly amongst unskilled workers) in South Africa (Lewis, 2001, 12) and the apparent shortage of labour with skills in the country.

South Africa's changing volumes of trade in different directions also makes analysis of the direction of trade important. For example, the share of exports to rich countries has declined relative to exports to the rest of SADC and other developing countries (Abdi and Edwards, 2002:11). It is useful to know more about the nature of trade in

different directions so that there will be a greater understanding of the impact that such changes are having on the economy. The direction of trade in the future is likely to be further influenced by free trade agreements (FTA). These include the FTA's between South Africa and the European Union in 1999, the African Growth and Opportunity Act (AGOA) with the US, the FTA being negotiated with SADC and Mercosur[1] and between SACU and the US (Alleyne and Subramanian, 2001:3; DTI, 2004a:1; Dyantyi, 2004) and other bilateral trade agreements such as with India and the Most Favoured Nation Status with China (Whitehouse and Associates, 2000:4).

The analysis of factor composition is recognised by various authors as a good starting point for analysing job creation. For example, it is important to recognise that different production processes have differing needs in terms of labour skill, capital and technology and this will affect growth and job creation (Lewis, 2001:62; Samson *et al*, 2001:3). Amsden (1987:131) also recognises that different production processes mean that commodities will play different roles in economic development and thus job creation. For example capital and skill intensive industries may contribute one job per million rand of investment, labour intensive industries, such as textiles, wood and leather, may contribute 5-9 jobs per million rand of investment, while agriculture and personal services may provide even more jobs (Lewis, 2001:81). This suggests that when analysing the impact that trade with different blocs has on labour, an important starting point would be to assess the factor composition of commodities making up such trade. Once it is known how trade in any particular direction impacts on labour, trade policies could be targeted to the benefit of particular labour groups.

While there is much research on the composition and structural change of South Africa's trade, Edward and Schoer (2002:12) argue that 'focus has been on commodity breakdowns to the neglect of regional breakdown'. This research will move toward redressing this gap by assessing South Africa's trade patterns with its major trading partners (Eastern Europe, the E.U, the Middle East, the Far East, North America, South America and SADC). It will assess how trade patterns differ between blocs and their change over the last decade. Factor content methodology will be used

[1] Mercosur, consisting of Argentina, Brazil, Paraguay, and Uruguay, hopes to complete its process of becoming a common market by January 2006 (European Commission, 2004a)

to look at how these changes are affecting demand for different labour groups in South Africa.

The period of the study will be from 1990-2002. This period incorporates the introduction of the General Export Incentive Scheme (GEIS) and its termination, the Uruguay Round of trade liberalisation agreements, the trade agreement between South Africa and the EU and discussions on the SADC free trade area (Abdi and Edwards, 2002; Alleyne and Subramanian, 2001:3; Lewis, 2001a). The factors to be considered are professional, skilled, semi / unskilled and informal labour. The research will be broken down into an analysis of the direction of trade in Chapter One, which includes trade theory and past studies of the differences in trade by direction. Chapter Two will examine the composition of South Africa's trade, directional differences and comparative advantage. As there is little research on the composition of trade for South Africa to different partners, the composition of trade in general will be assessed. Past research into the impact that trade has on labour in South Africa will be evaluated in depth in Chapter Three, and the nature of the employment problem in South Africa will be touched upon, including possible causes and solutions. Chapter Four will analyse the structural change between South African commodity sectors, including the contention of growing capital intensity and rising demand for skilled labour alongside falling demand for unskilled labour. Chapter Five provides a preliminary analysis of trade data to assess which product sectors are traded with each bloc and their trends over the period. The background to the factor content methodology and shortcomings are also considered in this chapter. Chapter Six will cover the empirical analysis, which includes a factor content study conducted to assess how trade to different trading blocs affects the type of labour demanded and the trends within each bloc with regard to labour use in trade over the period 1990 – 2002. The final chapter concludes with policy suggestions.

CHAPTER 1

TRADE THEORY AND THE DIRECTION OF TRADE

1.1 Introduction

The purpose of this chapter is to provide an overview of trade theory in order to understand why nations trade and to assess what determines the patterns of trade to begin with. It is seen that while traditional theory holds that trade patterns arise out of a countries resource endowments, new trade theories explain that trade patterns can be based on many other factors such as levels of development, economies of scale, distance or technology. The Chapter will also present evidence on the difference between South-South and North-South trade. This, together with trade theory, will provide insights into which countries are likely to trade with one another and how trade may differ by direction. The background will then be set in which to evaluate Chapter 2, which presents evidence for South Africa on patterns of trade and factor content. The importance of assessing factor content is to assess how trade may be impacting on the demand for labour.

The Chapter will be laid out as follows: Section 1.2 outlines the classical perspective of trade, which explains why nations trade. Neo-classical trade theory; and in particular the Heckscher-Ohlin Model, is reviewed in Section 1.3. This theory suggests that trade is based on a country's relative endowment of factors such as capital and labour. Extensions to this model are also reviewed, and it is seen that in a situation of more than two trading partners, a country may export both capital and labour intensive goods (this is not necessarily against the H-O theorem). Section 1.4 reviews new trade theories, which include the product cycle theory and models of economic geography, the Linder theory of trade, the Krugman model and the Capabilities Approach. These models introduce the idea of dynamic comparative advantage and intra industry trade which is necessary to understand how a country can both import and export a good intensive in the same factor and how trade between similarly endowed countries can occur. Section 1.5 provides general evidence on the direction of trade with regard to South-South vs. North-South trade. The debate is whether South-South trade is better or worse than South-North trade, considering the different factor intensities of each. The argument is important for the thesis in that the

factor intensity of trade in different directions impacts on labour demand and has implications for development and dynamic growth. Section 1.6 provides a summary of the trade theory and connections to the thesis, as well as presenting conclusions on the debate of the merits of South-South vs. South-North trade.

1.2 Classical Trade Theory

Adam Smith held that a basis for trade arose because nations would be better off if they specialized in the production of the good they were able to produce more efficiently (that is where they had an 'absolute advantage') and imported the good that could be produced more cheaply abroad. This would also result in productivity gains through increased specialization and international division of labour. Here, the cost of producing goods is measured by the labour theory of value, which is the amount of labour required to produce the good (Appleyard and Field, 1998:25-26).

Ricardo (1917:82-83) however, noted that even when one country had an absolute advantage over another in the production of both goods, trade was still possible. This is the theory of comparative advantage. All that is required is that the internal price ratios differ between the two countries prior to trade. If the international terms of trade lie between the pre-trade price ratios, then both countries can gain from trade; that is, a country will gain from trade if the relative prices of its own goods in autarky differ from the terms of trade. Trade is thus beneficial in that some goods can be imported at prices that are relatively lower than the price at home. This holds even in the case where a country has the absolute advantage or disadvantage in the production of all goods. In this model, price is determined by the equilibrium between the two trading partners (not solely by the labour theory of value). The strength and elasticity of demand each country has for the other's product, will determine where the equilibrium terms of trade will lie.

This is interesting when assessing the benefits of trade with different blocs. Developing countries in general, export largely primary goods which have lower demand elasticities than the more advanced goods exported by developed countries. The theory suggests that equilibrium terms of trade will lie in favour of the developed blocs and there will be growing disparity between the rich and poor nations. This is formally noted by the Prebisch-Singer hypothesis, which argues that as prices for

primary or low value added products do not keep pace with productivity compared to manufactured goods or high value added products, the terms of trade for developing countries has faced a long-run deterioration. This has caused the developing nations to lag behind the developed nations (Cuddington et al, 2002:1). This suggests that the direction of trade would make a difference to a nations pace and type of development.

Smith and Ricardo's theories assume a two-country, two-commodity world, and complete specialization in the good with an absolute or with a comparative advantage. Ricardo's work has, however, been extended in the Dornbusch-Fischer-Samuelson model, to include a continuum of goods. This model highlights technology differences between countries as a basis for trade and allows for the inclusion of other variables (Cheng et al, 2004:3). This model allows for a closer approximate of reality.

1.3 Neo-Classical Trade Theory (The Heckscher-Ohlin Model)

Neo-Classical theory, in particular, the Heckscher-Ohlin (H-O) model, argues that the gains from trade rely on different relative factor endowments. Different relative factor endowments would allow one region to produce a good more cheaply than another and vice versa thus forming the basis of trade (Ohlin, 1967:19). The model is based on two countries, two commodities and two factors of production, where factors are mobile internally but not externally. Crucial assumptions of the model are that factor endowments are different in each country and that commodities are always intensive in a particular factor regardless of relative factor prices. Other assumptions are perfect competition, perfect mobility of factors across sectors, trading partners produce homogenous products in the same industry, constant returns to scale, homothetic tastes and preferences, no transportation costs, the presence of non traded goods and significant technological differences between countries (Sen, 2003:6).

As there is perfect mobility of factors of production in perfect product and factor markets, unemployment does not theoretically exist (Bella *et al*, 2000: 293: Sen 2003:7). However the model does predict that the comparative advantage of a labour abundant country would be in labour intensive goods and the capital abundant country would be in capital-intensive goods. A country will thus export goods intensive in the factor in which it is relatively well endowed and import goods intensive in the factor which is relatively scarce (Morone, 1999:4). In developing countries, endowed with

more labour, production should shift towards the more labour intensive sectors and this should increase the ability of increased output to generate employment (Sen, 2003:6-7).

Due to the problems encountered in cases where trading partners are endowed with more than two factors of production, Vanek (1968:749) restated the theorem, referring to the amount of *factor-services* embodied in goods traded, rather than referring to the products themselves. The Heckscher-Ohlin-Vanek model of trade predicts that on the commencement of trade, 'The country relatively better endowed with one productive factor will be net exporter of the services of that factor, and net importer of the services of the other factor,' (Vanek, 1968:749). The 'factor contents' of trade could then be referred to rather than the types of products traded. It is this model which has been used in practice to test whether a country's trade patterns conform to the theorem. This was first done by Leontief in 1954, using factor content methodology on the U.S. He found that the country's imports had a higher capital to labour ratio compared to its exports. This was not expected for the U.S, which is considered to be a capital abundant country where exports should be more capital intensive than imports. The finding became known as the 'Leontief Paradox' and challenged the H-O-V theory (Alleyne and Subramanian, 2001:11-12).

The factor content method has also been used to assess the demand for a factor, such as labour, due to trade (Wood, 1998:1470). If the theorem is correct, the net trade of a labour abundant country should be intensive in labour. It is expected that developing countries will be net exporters of goods intensive in unskilled labour. Trade is thus predicted to impact positively on the demand for this factor in developing countries (Jenkins, 2002:3). There has however, been much criticism in the literature over the use of factor content. These arguments will be reviewed in Chapter 4.

1.3.1 Extensions of the H-O Model

In the H-O model, trade will be the most beneficial among countries with the most dissimilar factor endowments, so technically the South does not trade with the South (Amsden, 1987:126; Havrylyshyn, 1987:2-3). The pattern of trade that results is 'one way' in that a country will only export goods in which it has a comparative advantage and import those where it has a comparative disadvantage (Hodge and Nordas,

2001:95). Holden (1983:248) similarly argues that the factor content version of the H-O model does not allow strong predictions regarding the expected patterns of trade as it is limited by its two country, two good assumption. Standard theory can however, incorporate directional differences (Havrylyshyn, 1987:2-3). Krueger (1983:63) shows how a 'dual structure' of trade, as is found in South Africa, is natural under her adaptation of the H-O theorem. In an extended H-O model, Krueger and Baldwin (cited in Havrylyshyn and Wolf, 1987:150) argue that 'a country will import capital intensive goods from countries better endowed with capital than itself and import labour intensive goods from countries less well-endowed with capital.' If further factors such as skill are added to the model then there is greater opportunity for trade between developing countries with different factor endowments.

In an extension of the model to three countries, it is shown that the intermediate country, which is relatively labour-abundant, may still have capital-intensive exports (Holden, 1983:246). However, Holden argues that this does not invalidate the argument that a relatively labour-abundant country will export labour in exchange for capital; as long as its bundle of exports contain a higher proportion of labour than its bundle of imports. In other words, not all exports from a labour-abundant country need to be labour intensive, but net trade should be. Havrylyshyn and Wolf (1987:150) nevertheless maintain that it is still the case that the greatest trading opportunities will be with the developed countries.

1.3.2 Shortcomings of the H-O Model

Although research has found that the H-O theory does explain much of the variation between countries in their share of different sectors in exports (Wood and Mayer, 1999:3), there is still widespread agreement that the two-factor H-O model is inadequate as a method to explain the pattern of trade. This is because of its restrictive assumptions such as identical production functions among countries for identical commodities, homogeneous labour, constant returns to scale and the immobility of productive factors. When these assumptions are relaxed, the H-O theory cannot completely explain the pattern of trade. For example, Wood and Mayer (1999:3) argue that a country that is more efficient at producing a good would tend to export it even if its factor content gave it no special advantage. This could arise due to economies of scale, favourable government policies, transport costs or proximity to

a trading partner. These factors are part of the new trade theories, which will be discussed in section 1.4.

The factors capital and labour are also only two factors out of several that could influence the pattern of trade (Baldwin, 1979:40). Wood (1997:80-81) goes so far as to say that the conventional determinants of trade patterns, capital and labour (as argued by the H-O theory), are no longer relevant as capital is highly mobile and 'raw labour' is not so important to the competitiveness of modern industry as 'skill'. 'Typical resources' are argued to be human capital or skill, land (natural resources) and labour (number of people in the workforce) (Wood and Mayer, 1999:3-4). Wood and Mayer do not consider capital endowment as being able to bestow a comparative advantage in the production of capital-intensive goods for export due to its high mobility. They argue that if the resources are abundant, then capital can usually be obtained to develop the resource. The cost of capital is also similar in most countries due to the linking of capital markets globally. They claim that there is no evidence that capital is more expensive in the North than in the South with similar real interest rates (and profit rates). Infrastructure is noted as the exception, with differences in quality and availability acknowledged as being 'the second most basic economic difference (after skill) between developed and developing countries' (Wood, 1997:5).

The H-O-V theorem also includes the concept of factor price equalization, where factor prices between countries engaged in trade will equalize. Although factors are not mobile, goods embodying the factors are (Krugman, 1985:13). This will lead to a rise in the price of the abundant factor (which is being exported) and a fall in the price of the scarce factor (which is being imported) until relative factor prices equalize between trading partners. The factor price equalization theorem would ensure that there is no growing inequality between nations (Amsden, 1987:126). However, in practice, factor price equalization is unlikely to occur due to transportation costs, tariffs, subsidies, differing technology and economic policies which cause differences in product prices between countries (Appleyard and Field, 1998:139). It is also the case that if the demand for goods exported by developed countries is greater than that exported by developing countries, then the terms of trade will lie in favour of these countries.

It seems that the failure of the neo-classical approach is that it is 'commodity blind.' It does not consider the differences between primary goods and manufactured goods, such as their different income elasticities of demand. The declining ability of developing nations to purchase the goods of the developed countries has seen the latter increasingly engage in trade between themselves, while developing countries have been increasingly marginalized (Amsden, 1987:127). In order to close the gap somewhat, it is important for developing nations to find ways to increase their capacity to produce more technologically advanced products. This will be discussed further in Chapter 2.

1.4 New Trade Theories

New Trade theories, some of which are explained below, offer valuable insights into understanding the basis for trade and the direction of trade between countries. New trade theory, unlike classical theory, recognizes that trade is dominated by intra-industry trade or 'two-way trade among similar countries with similar products' (Hodge and Nordas, 2001:96; Holden, 1993:222). The theories help to explain how it is possible for countries with similar factor endowments to trade e.g. South-South or North-North trade. The basis for trade in these models does not depend on different comparative costs between countries and thus new trade theory is able to explain why countries with similar factor endowments find it beneficial to trade with one another (Holden, 1993:215:221). The contribution of new trade theories is to include product differentiation, scale economies and imperfect competition which give rise to the basis for trade. This is more in line with real world phenomena compared to the simplistic assumptions of classical and neo-classical models (Corden, 1978:3-7; Holden, 1993:215,221).

The importance of new trade theories in explaining South Africa's pattern of trade is highlighted in a study by Roberts (2000:625). The study finds that most manufacturing sub-sectors had signs of product differentiation and /or economies of scale and imperfect competition. Sub-sectors are also characterized by linkages, differentiated products and intra-industry trade. Due to these findings, Roberts (2000:633) goes so far as to say that orthodox trade theory, its assumptions and the efficient markets hypothesis underlying it, are inappropriate. The presence of intra-industry trade will also affect trade patterns between countries. Cattaneo (1998:221)

finds, for example, that intra-industry trade between SACU and Zimbabwe exceeds intra-industry trade between SACU and the rest of the world in a number of sectors.

1.4.1 The Product Cycle Theory and Models of Economic Geography

Vernon's (1966) Product Cycle theory explains how comparative advantage for any one country is dynamic and changes over time. This is important as it will affect what goods a country exports, which will impact on the type of labour demanded. In this theory, a product moves through different stages from its conception as a new product, eventually maturing and then becoming standardized. As a product matures, competition is through lower labour costs (rather than through product or process innovation) and production relocates to a country with lower wages (Edwards and Schoer, 2002:1013). During this process, the production of the product may shift from the innovating country to the country that was previously importing the product, due to lower production and transportation costs in the latter. They may even begin exporting the product back to the original innovating country if the labour costs in the innovating country are higher. The theory, unlike the H-O-V model, includes the concept of economies of scale and recognizes that capital and management are mobile. Factor endowments and prices however, are still important in determining the location of production (Appleyard and Field, 1998:177). This process allows one to see how the comparative advantage in a product can shift between countries and how it is possible for a developing country to export capital intensive products.

Models of economic geography also explain the phenomenon of shifting comparative advantage. In these models the backward and forward linkages generated by industry become important as they generate externalities (Edwards and Schoer, 2002:1013). For this reason large markets (the centre) may attract firms wanting to benefit from these positive externalities, such as the reduced costs of being nearer one's input supplier, good road networks and social services. Costs in the centre may eventually become prohibitive and lead to a move back to the periphery where wages are lower (Edwards and Schoer, 2002:1013). In a similar way, comparative advantage in producing certain goods may shift between countries.

These models mean that a developing country, like South Africa, may export more technologically advanced goods, which one might expect to be exported by the

developed countries. Nevertheless, by the time developing countries start to produce these goods, technologies embodied in the goods may be dated and developed countries are likely to be producing goods with newer technologies. This means that developing countries may remain a step behind. Applying economic geography theory to South-South trade, the establishment of an FTA with SADC for example, may mean that there will be a shift of manufacturing industries to the more established countries such as South Africa and Mauritius, and there may be a fall in manufacturing output in some regions as industry shifts to lower wage producers (Hess, .2003:3). South Africa's trade with SADC is thus likely to be more skilled intensive and imports more unskilled labour intensive.

1.4.2 The Linder Theory of Trade

While Linder (1961) considered the H-O-V theory capable of explaining trade in primary products, he argued that in manufactured goods demand would be the deciding factor. Linder believed that a country will produce goods demanded by the domestic market and any surplus would be exported. Countries purchasing these exports would be those with similar per capita income levels and demand patterns. The result is that most trade will occur between similarly endowed countries: developing countries are likely to engage in trade with one another as are developed countries (McPherson et al, 2000:4). This theory also explains why trade in similar goods or intra-industry trade occurs.

This theory does not seem to hold in South Africa's case, however, as its largest trading partners are developed countries. Indeed, in a study by Jerry and Thursby (1987, cited in Appleyard and Field, 1998:183), while this was found to be true for various European countries, the US and Japan, it was not so for South Africa (the only developing country in the study). Indeed, as will be shown below, South Africa's largest trading partner is the E.U (in general and for manufactured goods), which has a much higher per capita income level than South Africa. This suggests that the size of the market and its purchasing power are also important considerations in determining trade volumes between countries, which is not taken into account in this model.

1.4.3 The Krugman Model

The Krugman Model incorporates economies of scale and monopolistic competition with labour being the only factor of production. Products are assumed to be similar but differentiated (thus incorporating intra-industry trade) (Krugman and Obstfeld, 2000:130). Trade allows both countries to gain from economies of scale by enlarging their market, which reduces production costs. This would increase the output and wages in each industry in both countries. As products are differentiated, it also allows consumers greater choice (Appleyard and Field, 1998:192). Trade is thus not dependant on comparative advantage. In the model, a country's comparative advantage depends on its relative endowment of factors specific to an industry, but a country will still import when it has a comparative advantage in the good and export when it has a comparative disadvantage due to product differentiation and the possibilities of economies of scale. Krugman's model thus shows how it is possible for a labour-abundant country to export capital-intensive goods (Cattaneo, 1998:140).

1.4.4. Capability Approach

The Capability approach suggests that comparative advantage is more concerned with the ability to use technologies than factor endowments and highlights the importance of 'learning by doing'. While developing countries may have similar endowments, their comparative advantage may vary 'according to national policies for technological learning and technology import' (Lall, 2001:89). Lall (2001:90) argues that patterns of trade, as predicted by H-O theory, are more likely to be relevant where technological conditions approximate perfect competition (i.e. no economies of scale, universally available technologies and easy learning). This may be the case with simple labour intensive technologies where small firms make undifferentiated products and easily master the necessary technology. Here, relative wage differences are an important factor determining competitiveness. The decline of traditional sectors and growth of more technologically advanced sectors however, means that countries are likely to increasingly compete in terms of their skill and knowledge base in the future. This links to the importance of deepening technological processes which is dealt with in Chapter 2.

The significance of new trade theories to the thesis is that the factor content of a countries trade cannot be assumed from its factor endowments alone or from

traditional factors such as capital and labour. The fact that a country has a large body of unemployed labour, does not necessarily mean the country's exports will be intensive in labour. One cannot therefore make assumptions on the likely impact of trade on labour demand.

1.5 General evidence on differences in the direction of trade

The above analysis of trade theory provides a basis for understanding the patterns of trade between countries. This section will explore evidence on how trade differs by direction. In particular, the difference between South-South and North-South trade and the implications of these differences. The relevance of this analysis is to show that trade in different directions has implications for development and the type of labour demanded. The analysis will also provide a backdrop to Chapter 2 which will look at South Africa's patterns of trade and how these differ between trading partners and the implications of this.

There is a debate in the literature over whether South-South trade is more physical capital intensive than its Northern counterpart. Authors such as Krueger (1983), Havrylyshyn and Wolf (1987), and Deardorff (1987), using methodologies based on the Heckscher-Ohlin model, argue that it is. A study done by the National Bureau for Economic Research (NBER) shows how the expectation that a developing country's exports will be capital intensive downstream (to less capital-intensive countries) and labour intensive upstream (to more capital intensive countries) is borne out (Krueger, 1983:108). For Chile, Uruguay and Brazil, exports to the Latin American Free Trade Association (LAFTA), a developing bloc, were sizeably more capital intensive while exports to developed countries were more labour intensive. The results of the NBER study led Krueger (1983:110) to argue that in determining the factor intensity of trade, it is important in which sectors trade originates, as well as which countries are the trading partners.

Havrylyshyn and Wolf (1987) agree with the finding that South-South trade is more capital intensive, but they argue that it is also more skill intensive. This goes against general comparative advantage of labour-abundant countries with shortages of skills and thus they argue that this type of trade should not be encouraged. Diaz-Alejandro (1974, cited in Amsden, 1980:2) similarly found that trade between Latin American

countries was more capital intensive as well as more sophisticated, and argued that this trade is merely 'an effort to recoup the losses arising from excessive import substitution.' Such trade, it is believed, is made possible due to preferential agreements between regional partners (Amsden, 1980:2). However, Amsden (1980:12) shows that not all trade in manufactures among less developed countries (LDCs) benefits from preferential agreements and Diaz-Alejandro's claim is unwarranted.

Amsden (1980:12) also finds the claim that South-South trade is more capital intensive unwarranted. She finds that capital intensity does not differ greatly in any direction although it is positively correlated to exports (Amsden, 1980:4-5). Amsden (1987:124) puts the differences down to different methodologies, as these studies do not consider skill as a separate factor of production. Indeed, when Lall (Havrylyshyn, 1987:114) updates Havrylyshyn and Wolf's analysis, he confirms that South-South exports are more capital intensive than those to the North but finds they are rather *human* capital intensive rather than *physical* capital intensive. Lall therefore argues that this would be in line with Amsden's findings that developing country exports to North and South differ in skill intensity but not so much in physical capital intensity. This is also in line with Wood and Mayer's (1999:4) argument, presented above, that trade is based on skill differentials and that capital should not in fact be considered to be a factor able to bestow comparative advantage.

Although studies including Leamer (1984), Bowen and Sveikauskas (1987) and Forstner and Balance (1990, all cited in Wood, 1998:114) are not successful in relating trade in manufactures to differences in endowment of capital and skill, Wood argues that if allowance is made for measurement errors and interpretation, (as the influence of capital is not properly tested for using the capital-output ratio) their results are largely found to be in line with Wood's - that trade is based on differences in skill availability rather than capital endowment (Wood, 1997:115). This is supported by studies done by Balassa and Bauwens (1988) and Minford (1989 both cited in Wood, 1997:116). Baldwin (1979:46) also finds that for most of the countries in his research, *human* capital variables 'play a significant role in the expected direction.'

Wood (1997:117) argues that after around 1960 a new pattern of North-South trade specialization emerged. Immobile factors, including natural resources and skill seemed to determine the pattern of comparative advantage according to Wood (rather than mobile capital). Wood cites Forster and Balance (1990) in support of this claim. They found that expansion in the North was concentrated in skill intensive and not capital-intensive industries while in the South there was an expansion of capital intensive and skill intensive sectors (possible due to industrial protection). This seems to be in line with South Africa's present pattern of trade. The implications of this is that trade in general, regardless of direction, is rising in skill intensity and is likely to be increasing the demand for professional labour. Whether this is due to trade itself, or other factors such as technology will be examined further in Chapter 2. Wood is criticised by Lall (2001:133) for ignoring technology in this argument and assuming that skills are generic. The type of technology that a country uses relates to a specific set of skills. Extensive research shows that central to industrial competitiveness is specific skill acquisition, and this is the predominant factor determining patterns of comparative advantage (Lall, 2001:133-134). This suggests that rather than focus on increasing skills in general, a country should focus on developing skills in certain promising sectors. This will be discussed further in the concluding chapter along with policy suggestions.

The finding that South-South trade is weighted in sophisticated or skill intensive goods is less contentious than the claim that such trade is more capital intensive than South-North trade. The argument that intra-South exports are of greater skill intensity than the South's exports to the North[2] is supported by Amsden (1980:4-5), Diaz-Alejandro (1974, cited in Amsden, 1980:5), Havrylysham and Wolf (1987:150) and others. Amsden (1987:133) found that the exports of producer goods with regard to the newly industrialised countries (NICS) 'flow almost entirely to other developing countries.' Lall (Havrylyshyn, 1987:110) similarly finds that Brazil in 1977 was exporting over 60 percent of capital goods to developing countries. The greater skill intensity of intra-South trade is partly due to the fact that a large volume of South-South trade is in producer goods - usually intermediate inputs and capital goods or

[2] Amsden's (1980:5) study is based on factor intensity data for US industries.

engineering products (Amsden, 1980:12). While these can be capital intensive, they are also often skill intensive.

The significance of this is that these goods also have the largest economy-wide externalities, as output is usually the input of other sectors. In other words, linkages will be greater in South-South trade than South-North trade. Greater linkages should mean that such trade would have a larger positive impact on labour demand. The second implication of South-South trade being more skill intensive is that there is a growth of technology exports among developing countries and this is a sign of changing comparative advantage (Lall, 1987:110). Lall suggests that these products may 'be the leading edge of the South's dynamic comparative advantage' in the future. Encouraging such trade would work to close the gap between the North and South and encourage the development of goods of higher value. The empirical section in Chapter 4 will evaluate if there are greater linkages in South Africa' trade to developing blocs compared to the more developed blocs and look at what sectors are being traded in order to evaluate these claims. Past evidence on the type of trade conducted in different directions will be evaluated in Chapter 2 as preliminary evidence of these arguments.

1.5.1 South – South Trade

Amsden (Havrylyshyn, 1987:123) argues that, historically the direction of trade has mattered for development. She argues that South–South trade is a relatively new trade flow and it is important to examine its implications for technological progress and capital accumulation. A strong argument in favour of developing nations trading with one another is that they may be able to compete in each others market better than they would in developed markets. This has advantages from a developmental point of view in that they may be able to develop more technologically advanced goods through exports to these countries. If they are to begin to close the gap with the more developed countries and reduce the volatility of economies relying heavily on primary good exports, development of these technologies is essential. The reasons why a developing country may be more easily able to compete in other developing countries compared to developed countries (aside from any trade agreements, transport costs or cultural affinities), could be because technology is simpler and more suited than

imports from the North or that goods are less costly (Lall, 1987:110)[3]. Indeed Amsden (1980:15) argues that this is the basis of comparative advantage in technological exports by semi-industrialized countries. Due to lower incomes, goods are usually of a lower price and 'less exacting', enabling developing countries to compete (Amsden, 1987:125).

Another reason for their greater competitiveness is that the closer income levels between developing countries, may means commodities and prices are more suited (Amsden, 1987:125). This is in line with the Linder theory which argues that trade in manufactured goods will be greater between countries with similar per capita income levels as they will have similar tastes. In support of the argument is Lall's (1987:116) study on Indian technological exports to developing countries. Lall found that developing countries tended to compete by adapting foreign technology to appropriate scales for transfer to other developing countries or incorporating indigenous R&D and more 'informal' technology suited to developing regions.

Markets in developing countries are also generally of higher risk, which deters entry by developed countries (Amsden, 1987:125) and these markets generally require a lower capital outlay, which suites penetration by developing countries. This may be why South Africa seems to have displaced a large portion of OECD exports to SADC (Lewis, 2001:51) and why intra-developing country exports have expanded so rapidly in recent years. Cizeljic and Fuks (1987:144) note too that developing countries have found it easier to market their sophisticated manufactures and capital equipment among themselves. It was found that consumer goods and less sophisticated manufactures were exported to the North, while capital equipment and technological intensive products, such as heavy equipment, construction, material, transport equipment, motor vehicles, machines and metal products were mostly exported to developing countries. This supports the argument that there are certain advantages for developing countries in intra-South trading that they do not have with the North.

Another argument for the importance of South-South trade or trade between

[3] Amsden (1980:14) cites an example of machine tools exports from Brazil and Argentina to other LDCs, which have a lower unit value than their machine-tool imports indicating that the technology is simpler.

developing countries is as a way to reduce dependence on the industrialised countries (Amsden, 1980). Stewart (cited in Amsden, 1980:1) believes such trade to be a 'strategy for development' and for the transfer of suitable technologies in the Third World. Lewis (2001) however argues that regional growth experience for CARICOM, a regional trading arrangement among developing countries of the Caribbean, has been relatively sluggish, which does not suggest dynamic gains, although further research is needed.

In line with this, Havrylyshyn (1987:32) finds that more dynamic exporters rely less on developing country markets. The greater the share of exports going to developing countries, the lower the rate of export growth. This however, cannot be presented as a case that trade to the North is superior to intra-South trade. Developing countries may be used as 'stepping stones' to increased exports to the more advanced markets and so Havrylyshyn's results are to be expected; that is the more competitive a country becomes the more it will export to developed countries. It is also the case that developed markets have the benefit of market size, which would allow a faster rate of export growth. Before this stage however, exporters may well need to export to other developing markets to build up their capacity. Historical examples of this are Japan and Canada, which both exported large quantities of capital goods to developing countries at the start of their development process. As development proceeded, these quantities declined. This suggests that exports to developing countries prepare the way for exports to industrial ones, although this is not conclusive (Amsden, 1987:130).

Havrylyshyn and Wolf (1987:152) contend that as long as trade maximises benefits and there is no wedge between private and social costs, then there is no case for supposing that trade in one direction is superior to trade in another. This however is a static view and the main claim for greater South-South trade is the 'dynamic' benefits it provides. Havrylyshyn and Wolf (1987:152) argue that even if there are dynamic benefits, the export of these goods between developing countries is only a small part of total exports. This leads to the response by proponents of South-South trade that intra-South trade is too small and should be increased to benefit from its dynamic advantages. The small size of these markets may limit this option however. It is also the case that any dynamic benefits have not been empirically demonstrated which

would be necessary to reinforce this argument.

1.5.2 South – North Trade

The benefit of trade with developed countries is that they are large, well established markets that provide the demand necessary to spur growth and increase employment. While developing countries may demand a higher proportion of technology goods as a percentage of total trade, the large market of developed countries means that in actual volumes it is likely that they will demand more of all types of goods. This, at least, is the case for South Africa and will be elaborated on below. The implication is that developed countries are still demanding, and thus encouraging, the production of high-technology goods through trade, even though they are demanding relatively more natural resource goods or primary products. This latter fact is not necessarily bad. Natural resource products tend to be unskilled labour intensive, which is beneficial to the employment of this large labour group (Alleyne and Subramanian, 2001:7).

The argument that the South should trade more with itself rather than the North is due to evidence that there is a growing disparity or gap between rich and poor nations and that the terms of trade are worsening for developing countries due to the low income elasticity of demand for primary or low value-added products, which make up the bulk of LDC exports to the developed countries (Appleyard and Field, 1998:387, 394). For example, world prices for 18 major commodities fell 25% in real terms from 1980 to 2000. This has had a devastating effect on Sub-Saharan Africa, which lost an average of 16% of its GDP from terms of trade decline from 1987-89 compared to 1980. The situation worsened much further in the 1990s (Chien Yen, 2004:5).

It thus seems wise to decrease dependence on limited primary export commodities which are prone to price and volume fluctuations and can disrupt fragile economies. South Africa, for example, is trying to reduce reliance on primary produce in favour of increased manufactured goods in order to make it less susceptible to demand shocks in mineral exports (TIPS, 2000:20). It is also the case that capital will move to countries where it will find the highest return (Helleiner, 1989:1445). This tends to be in countries with products fostering technological innovation that have a growing

world demand. For example, of the total FDI of OECD countries, 60-70 percent of it went to the NICS (Helleiner, 1989:1445). More recently, China receives about one-third of the total investments flowing to developing countries, although the eight Asian Newly Industrialized Countries (NICs)[4], Brazil, Mexico, and Argentina also receive significant amounts (these 12 countries together receive three-fourths of all FDI flows to developing countries) (Bates, 1999:2). Developing countries, which have used foreign investment most successful in their development strategies, have used the investment to expand technologically-sophisticated manufactured exports (OECD, 1998). It would seem therefore, that to attract investment, it is necessary to adapt products and technology accordingly.

1.6 Conclusion

This chapter undertook a review of trade theory to understand why nations trade and the type of trade that is likely to be conducted between nations. This is important in order to know what to expect regarding the factor content of trade, which will affect the demand for labour. The type of goods traded also has implications for development. The Ricardian theory shows that due to differing demand conditions, while both countries can benefit from trade, the terms of trade may lie in favour of the country which produces the good where demand is greatest. This suggests that the terms of trade may lie in favour of developed countries which exports goods that are more price inelastic following a change in demand. It follows that the type of goods traded are important for a countries terms of trade and developmental prospects. Exporting largely primary goods will result in a widening of the terms of trade as noted by the Prebisch-Singer hypothesis.

The prediction of the Hechscher-Ohlin model is that a country will export goods which are intensive in its abundant factor and that trading opportunities are greatest with those with the most dissimilar factor endowments. As developing countries are abundant in natural resources this would mean that their trade should largely consist of exporting these products to the developed countries and importing more advanced goods. This may result in an ever widening terms of trade. New trade theories however, suggest that there are other factors besides endowment which can give a

[4] The eight Newly Industrialized Countries (NICs) are Hong Kong, Indonesia, Malaysia, the Philippines, Singapore, South Korea, Taiwan, and Thailand (Bates, 1999:2).

country a comparative advantage. There are a number of reasons why a developing country, for example, may export more advanced manufactured goods to other developing countries. This may be due to the closer proximity of the country to itself, technologies may be more suited between countries of similar income levels or the country may specialize in the sector and develop economies of scale which give it a cost advantage over other countries in trade. A country is thus not confined to export goods intensive in the resources in which a country is endowed. This makes studying the direction of trade interesting. The question asked, which will be explored in this thesis, is what is the nature of trade in different directions and how do these differences impact on development and the type of labour demanded in a country.

Amsden (1987:134) argues that trade between developing countries has a more favourable commodity composition, that is more sophisticated products with greater dynamic advantages. She argues for increasing trade between developing countries 'if only by substituting southern exports for northern ones'. One should however be careful not to engage in trade diversion, and any increased trade should be due to its greater competitiveness. This view is propounded by authors such as Lall (1987), Cizeljc and Fuks (1987), Havrylysham and Wolf (1987) and Havrylysham (1987). Lall (1987:117, 119) argues that the promotion of intra-South trade should not inhibit South-North trade and warns against policies of 'self-reliance at all cost' which can lead to inefficient structures arising, technological lags and hamper future ability to export technologies to the South. Indeed he argues that the export of more standardised products to the North does not conflict with exporting skill and technology intensive products to the South.

Further evidence that there is no conflict of interest is given by Cizeljc and Fuks (1987:146) who find that increased intra-South trade is likely to affect only the composition of trade to the North rather than the volume. This is due to the differences in factor endowments that will persist, thus maintaining the attractiveness of the North as a market. Havrylyshyn (1987:33) provides evidence that generally, countries do not do better by shifting from one market to another. Rather, success in one market usually means success in others, and he found that 'good export performance was independent of direction.'

The conclusion is that there should not be a general preference for one type of trade over another, but rather a 'good overall trade policy'. If, for example, intra-South trade is being hampered due to lack of infrastructure, poor information or high protection, so that there is a divergence between private and social costs, then efforts should be undertaken to remove these obstacles (Havrylyshyn and Wolf, 1987:117, 4). Trade among developing countries should thus be seen as complementary to, and not a substitute for Northern trade. The promotion of intra-south trade is important to foster development in these countries and this in turn will be in the interests of the North (Cizeljc and Fuks, 1987:146). Nevertheless, it can be noted that trade varies according to direction and this could possibly be used in trade policy to meet certain objectives. As the South is a relatively small market, the benefits of such trade may lie more in the dynamic benefits of increasing skill and technological capacity, which may be beneficial to long run growth. Trade with developed countries, due to its large size, may be better for providing employment and growth in volume of output.

CHAPTER 2

PATTERS OF TRADE IN SOUTH AFRICA AND THE IMPLICATONS FOR LABOUR

2.1 Introduction

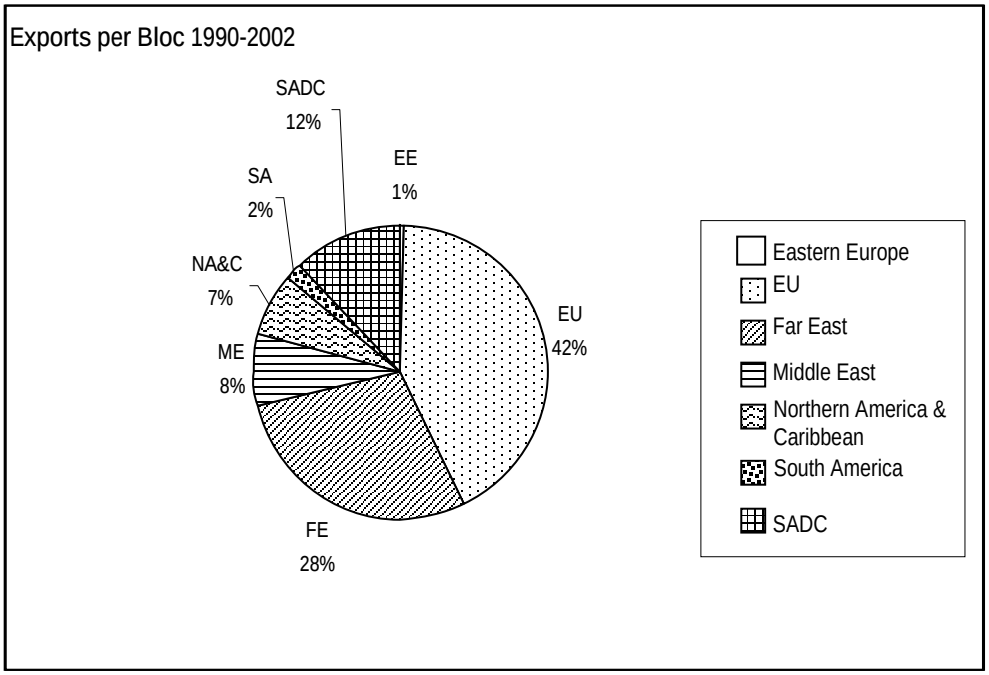
The last Chapter looked at Trade theory in order to understand what determines trade patterns; that is, which countries will trade with each other and what goods they will trade. It also looked at the factor intensity differences in South-South and South-North trade. In this chapter, Section 2.2 will look at the evidence for South Africa regarding its patterns of trade in different directions. Section 2.3 will assess the nature of this trade in order to understand the implications that trade with certain countries will have for labour and for development, which are the main concerns of the thesis. The connection with labour is made through the H-O-V theorem and the factor intensity of trade with the assumption of constant wages. The aim of this is to establish if there is a difference in the nature of trade by direction in South Africa. If there is, then it is likely that trade with different blocs will have differing impacts on labour demand, which will be investigated in the empirical section in Chapter 4.

To get further insight into how the nature of trade in South Africa varies to different partners and the implications thereof, Section 2.4 considers South Africa's revealed and dynamic comparative advantage and changes in the RCA according to the trading partner concerned. As the type of products traded have implications for development, the nature of trade with developing countries is interesting as it may provide the platform to develop a larger base of technologically advanced products. For this reason, South Africa's regional trade is looked at in Section 2.5, while section 2.6 considers the literature on technology and development. Section 2.7 concludes.

2.2 Direction of South Africa's Trade

According to Alleyne and Subramanian (2001:4), South Africa's largest export markets include the EU (38% of exports), East Asia and Pacific (27%), Sub-Saharan Africa (SSA) (14%) and the USA (12%). Pie chart one below similarly indicates that for the sectors considered in this thesis (Agriculture, forestry and fishing, Mining and quarrying and Manufacturing) exports follow this pattern.

Chart 1



Source: Own calculations

When categorised according to income levels, of South Africa's total trade, 79% is with high-income countries, 9 % with middle-income and 12 % with low-income countries[5] (Alleyne and Subramanian (2001:4). High-income countries comprised the bulk of total trade in all sectors in 1997, namely natural resources, basic manufactures and sophisticated manufactured goods.

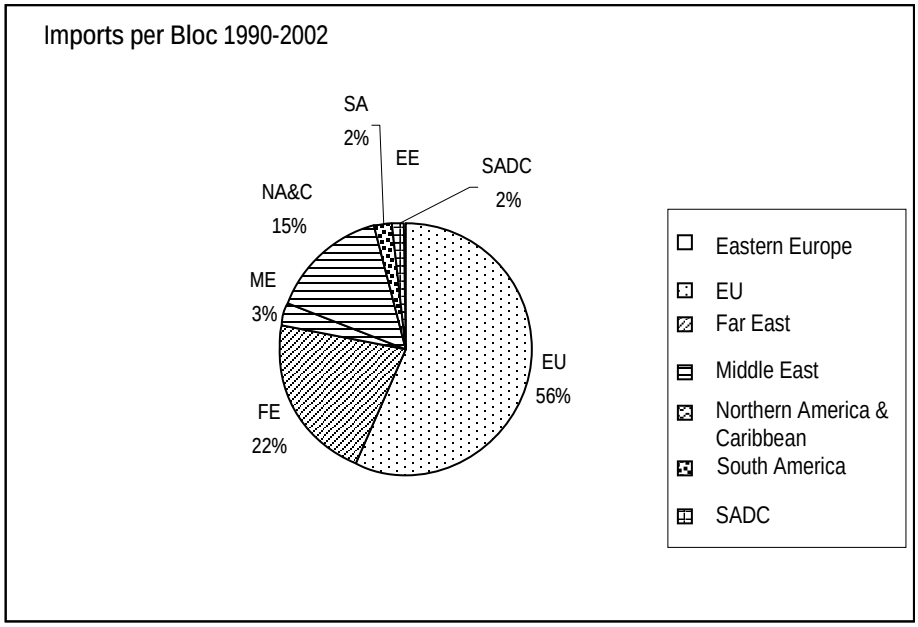
Although the share of exports to rich countries is high, it has fallen since 1988 while the share to the rest of SADC (RSADC excludes South Africa) and other developing countries, as well as China and India, has risen. The rise in the share to the RSADC, which peaked at 14.2% in 1996, may have been a once off adjustment to trade liberalisation (Abdi and Edwards, 2001:11). This is supported by the Trade Industrial Policy Strategies (TIPS, 2001a) which finds that although SACU exports between 1994-1998 showed the highest growth to the rest of Africa and the Middle East, some of this increase was due to export diversion to these regions away from Europe and the process was reversed in 1998. TIPS conclude that while small gains have been

[5] Alleyne and Subramanian (2001:4) break South African export markets into income levels: 1) High-income, including the EU and the rest of western Europe, North America and Mexico and East Asia and Pacific; 2) Low-income countries including sub-Saharan Africa and South Asia, and 3) Middle-income countries including the rest of South Africa's trading partners.

made in Africa and North America, Europe has become a more important export market, while the share to Asia has fallen over the period. This size of the European market and the FTA that South Africa has with this bloc are likely to be contributing factors to this.

For imports, pie chart 2 shows imports from the EU, Far East and Northern America blocs to be the highest. This would be expected as these are the most developed blocs of the groups being considered and would have products which South Africa may not necessarily have the skills to manufacture. Imports from SADC and Eastern Europe are the smallest. The small share of imports from SADC highlights the discrepancy between exports and imports and justifies the concern over the imbalance of trade between South Africa and SADC.

Chart 2



Source: Own calculations

While there has been a decline of imports from rich countries between 1989-1998, imports from SADC, China and India and the rest of the world (ROW) increased. From these changes, one would expect that imports would be displacing increasing amounts of unskilled labour in South Africa as SADC, China and India are unskilled labour intensive. It is still the case however, that imports (over 70% in all years) and exports are still heavily dominated by the rich and the percentage from the RSADC

for example, is still less than 1.5% (Abdi and Edwards, 2001:10).

2.3. South Africa's Trade Composition and the Implications for Labour

This section will look at the content of South Africa's trade and the preliminary expectations that this would hold for the likely impact of trade on labour. Analysing which sectors a country has a comparative advantage in is an important step to understanding with whom they will trade and what products will be traded. The use of revealed comparative advantage (RCA) as a measure of competitiveness shows South Africa to have an advantage in agriculture, mining and natural resource intensive commodities relative to the rest of the world and a comparative disadvantage in high-technology products like communication equipment and electrical machinery (Edwards and Schoer, 2002:1022). This would be expected for a developing country like South Africa. As Alleyne and Subramanian (2001:7) find, most of South Africa's trade is with rich countries, the overall trade balance has large deficits in sophisticated manufactured goods, with large surpluses in natural resource goods while basic manufactured goods are in near balance. This, they argue, seems to categorise South Africa's status as a developing country.

As well as the overall trade balance, it is important to analyse trade by direction, which was done by Alleyne and Subramanian (2001:4). Table 1 below presents their findings.

Table 1 South Africa's trade by direction

	Natural Resources	Basic Manufactures	Sophisticated Goods
High-income countries	66.2%	-4.2%	-73.9%
Middle-income countries	6%	12.3%	–57.9%
Low-income countries	–22%	35.5%	33%

Source: Alleyne and Subramanian (2001)

It can be seen that trade with lower income countries has positive trade in sophisticated goods and basic manufactures and that with high income countries is strongly positive in natural resource intensive goods and negative in sophisticated

goods and basic manufactures. In general, Alleyne and Subramanian (2001:3,22-23) find that although South African exports to all markets are capital intensive, this is 'particularly strong' for high-income partners, while exports to lower income partners are more skill intensive. This pattern is in line with findings presented in Chapter one for South-South and North-South trade, that trade with the South or less developed countries contains more sophisticated goods, while trade with the North is more natural resource based. It also reinforces Amsden's (1980:4-5) findings regarding skill and capital reported in Chapter one; that developing country exports differ in skill intensity but not so much in physical capital intensity.

The variation in the type of trade between trading partners highlights the point that trade to different blocs will have dissimilar impacts on what resources are demanded in the economy. The implication of the findings is that trade with developed countries should demand more unskilled labour than trade to less developed countries. The higher proportion of sophisticated products to low-income countries means that trade in this direction is likely to demand more skilled and professional labour.

The study however, did not take into account the indirect effects or linkages a sector may have to other sectors in determining its factor content. Neither did it consider the opportunity cost of trade intensive in professional labour. Lewis (2001) argues that the shortage of skills in the economy should be taken into account, as increased trade to low-income countries could have a high opportunity cost to other sectors if labour with scarce skills is drawn away from these sectors. Such considerations will be dealt with in Chapter Four.

2.4 Revealed and Dynamic Comparative Advantage

The RCA referred to above measures the share of a commodity in a country's total exports compared to the share of that commodity in world exports at any particular point in time. It is a static measure and is not ideal if one wants to measure changing competitiveness over time (Edwards and Schoer, 2001:19).

For this reason, attempts have been made to create a dynamic RCA indicator. Although it should be noted that these indicators have shortcomings as well, such as the arbitrary nature of what variables to include and how much weight to give each

variable (Edwards and Schoer, 2001:19). Valentine and Krasnik (1998:14-15) use the growth rate of RCA as an indicator of *potential* economic growth and interpret products with *rising* RCA as becoming more competitive. In the dynamic calculation, a larger number of sectors are higher value added ones and have a higher ranking in their growth in share of total world trade. For many SADC countries they found that high-technology sectors were dynamically competitive between 1986-1995 and there was a positive correlation between higher value added sectors, those with faster growing RCA and those with higher growth in world trade. They argue that this is positive in that it implies that SADC has potential to move from traditional resource based goods, which do not have high rankings in terms of growth in share of world trade, to higher technology exports that do (Valentine and Krasnik, 1998:14).

In line with these findings are those by Edwards and Schoer (2002:1024). In their calculation of potential comparative advantage for South Africa, 7 of the top 25 sectors are high-tech sectors with higher rankings in growth in share of world trade. This contrasts to the static RCA calculations where natural resource sectors dominate and sophisticated sectors show a negative RCA. The International Trade Centre (ITC) obtain similar results from their composite indicator with non-traditional exports dominating, while traditional exports still dominate the static indicator (Edwards and Schoer, 2001a: 9). These findings indicate that although South Africa has a comparative advantage in natural resource intensive products, there has been a growth in the comparative advantage of non-traditional products.

Due to various shortcomings in the dynamic indicator used by Valentine and Krasnik, Edwards and Schoer (2001:19-20), following Tsikata (1999), vary the method for measuring competitiveness. They examine exports according to their share in the South African market and their share in the world market assessing whether shares are rising or falling and the pace of each. Six categories are then determined:

Table 2: Market Position of Exports

Category	Products share in S.A. exports		Products share in world exports
Rising Star	Increasing	>	Increasing
Falling Star	Increasing		Decreasing
Lagging Retreat	Decreasing	>	Decreasing
Lost Opportunity	Decreasing		Increasing
Leading Retreat	Decreasing	<	Decreasing
Lagging Opportunity	Increasing	<	Increasing

Source: Edwards and Schoer (2002:1026)

A rising star, for example, is a product whose share in world exports is rising, while its share in South African exports is rising even faster. If its percentage share is not rising as fast in South Africa as it is globally, it would be a lagging opportunity. Using these categories, data is analysed for South African trade to 'rich' countries, RSADC and the rest of the world (ROW) (Edward and Schoer, 2001:27). It is found that while rising stars have fallen as a share of trade to rich countries between 1990-98, for RSADC they have remained at around 30% of exports since 1992. This, they argue, indicates that RSADC has been used to restructure exports into 'sustainable competitive markets' and due to the regional comparative advantage in non-resource intensive products, this could promote the production of higher value added sectors. The combined share of rising stars in human capital and technology intensive products in total trade with RSADC was relatively high compared to that with rich countries. This is important as commodities with the most dynamic growth in world trade fall into technology and human capital intensive sectors. This again fortifies the argument of using RSADC to build these sectors.

Falling stars (the product's share is rising in SA exports but falling in world exports) were found to have increased to all three regions over the period (1990-98), but especially to the rich countries and to the ROW in 1996-1998. Leading Retreat indicates a restructuring out of declining markets (mainly in agriculture and unskilled labour intensive sectors for all regions) but restructuring has been more into falling stars (where the product's share is rising in SA exports but falling in world exports), as opposed to rising stars, which are growing in world trade. Leading retreats were important to the rich countries and ROW and increasingly became more important in RSADC trade from 1994-96 onwards. SACU may be increasingly trading with RSADC in these declining sectors due to increased competition in more developed

markets (Edward and Schoer, 2001a:29). Lagging opportunities, which show a restructuring into growing world markets, have increased continuously to each region but greater effort should be made to gain shares in these emerging markets before the opportunity is lost. This is mainly in unskilled labour intensive, technology and human capital intensive sectors for all regions. The lost opportunity category for RSADC contains a large share of human capital intensive products (Edward and Schoer (2001a:29). It could be because of the shortage of skills that these opportunities are being lost.

This type of analysis would be ideal to ascertain whether trade to 'the North' is less dynamic in terms of rising future demand than trade to 'the South'. That is, if it could be shown that trade to the South contains more goods that are growing in world demand, this would be a case for increasing trade to these countries to benefit from products which will be the areas of growth in the future. The problem with this analysis is that commodities do not consistently fall into any one category. Prices and demand are also found to be volatile and a product declining this year in world trade may be rising in the next (Edwards and Schoer, 2002:1042).

A clearer picture may possibly be obtained if the growth in share of a commodity in total South African trade and its growth in world trade was measured over a longer period or if certain technologies were looked at instead of goods. It is expected that commodities will fluctuate from year to year, but what needs to be established is which commodities are growing consistently in world trade and South Africa's competitiveness in these sectors. For example, a product may fall into a rising star category if its growth in domestic trade is greater than its growth in world trade over a five or ten-year period. Historically, it has been argued that the time for old technologies to be replaced by new technologies takes between 30-40 years (The Economist, 1999). This means that commodities embodying aspects of the 'new technologies' of the future should show a continuous increase in global demand over time.

Another problem identified by Edwards and Schoer (2001:27; 2002:1037) is that rising stars experience changes in factor intensity so that the structure of factor usage is unclear. While this may reflect world demand volatility, it may also indicate a

failure to consistently move into growing world markets. Despite these shortcomings, Edwards and Schoer (2002:1041) conclude that South Africa has failed to restructure significantly into dynamic growing world markets with most exports in declining world markets. They also argue that the skills shortage and competition from developed and South East Asian economies in technology sectors may prevent the increase of technology and human capital intensive exports, which generally represent the rising stars. They suggest a possible expansion into resource or labour intensive commodities in which South Africa already has a comparative advantage, arguing that falling stars can be used as a stepping-stone to move into the rising star category (Edwards and Schoer, 2002:1042; Edward and Schoer, 2001:31).

Wood and Mayer (1999:1-2) similarly argue that most of Africa should be focusing on raising the level of exports in general with particular focus on natural resources, following a path similar to land-abundant America, rather than land-scarce Asia. They believe that Africa's export structure 'may just reflect the region's comparative advantage,' and supplies of human and natural resources. This, they argue, is only likely to change slowly over the next few decades. However, Edward and Schoer, (2002:1024) argue that the best way to exploit the SADC's comparative advantage (as calculated dynamically) would be to encourage trade with developing countries, such as Brazil, China and India, which is technology and human capital intensive. They argue that such trade could be used to develop non-traditional exports in which South Africa has a regional comparative advantage (Edwards and Schoer, 2001a:22). This may also allow capacity development in these products so that they may eventually be able to compete in developed markets. This is important if these products are the ones growing in world trade so that Africa is not left further behind in the production of higher value added goods.

2.5 The Significance of Regional Trade to South Africa

Due to the importance of the type of trade conducted with developing countries from a developmental perspective and also the dynamic benefits from developing as a region, this section will look at the nature of South Africa's regional trade.

Although regional exports are still a small part of production, African countries have become increasingly significant as export markets for South Africa in manufacturing.

The African market has risen in importance as a trading partner for South Africa, from 9.1% in 1988 to 18% in 1996 (Roberts, 2000:628). Along with the political changes in South Africa in this period, the closer proximity of South Africa to these countries could be a contributing factor. Frankel and Romer (1999:383) and Amsden (1976:789) find that distance is highly significant in influencing trade. For global trade, Africa's location seems to be a constraint. It is too far from Asia Pacific to attract low wage investment, and it is likely to lose out to the Eastern bloc countries which are closer to Europe and are likely to be more successful in competing for European investment in low value-added activities (McCarthy, 1998:442). For this reason, Africa may need to increase regional trade, and indeed for SADC, the 1990s have seen the absolute volume of intra-SADC trade grow (Lewis, 2001:50).

For South Africa, the African market is significant for exports of non-traditional manufactures, including motor vehicles, machinery, plastics, pharmaceuticals and chemicals (Black and Khan, 1998:12; Holden, 1998:464). This compares with exports to the rest of the world, which are largely resource-based (gold, coal, aluminium and iron and steel products) (Holden, 1998:464). In light of the dynamic advantages that non-traditional exports offer, rising regional exports may be useful to take advantage of this (Lewis, 2001:50). Developing non-traditional products through regional exports may be a step toward the export of these products to more established markets. This is important if South Africa is to take advantage of the 'strong world growth' of the high-tech sectors, noted by Edwards and Schoer (2002:1025). Evidence of sectors using regional exports to grow is given by Roberts (2000:622) who notes that in South African manufacturing sub-sectors, those with significant increases in exports had Southern African countries as the first or second largest buyers[6]. With regard to the services that South Africa offers through FDI, the majority of investments are in other developing countries e.g. cellular phones, financial service companies and tourism. The development of high quality services is necessary for an economy to participate effectively in the globalisation process, and regional trade may work to facilitate this process (Hodge and Nordas, 2001:120).

[6] Zimbabwe is mentioned as an important market although the economic and political problems since this article by Roberts was written (in 2000) would have impacted negatively on trade with this country.

Intra-regional trade in Southern Africa (as a proportion of overall trade) remains low, despite the attempts to promote it (Holden, 1998:467), and despite the unexploited markets such as those in West Africa (Black and Khan, 1998:12-13). Although the SADC free trade area is likely to encourage African trade and market access (Black and Khan, 1998:12-13), there is a fear that the future absorption capacity of this market is limited due to South Africa's large trade surplus with African partners and its market size. South Africa's total imports from SADC countries in 1995 were only 7.4 % of total imports (Holden, 1998:464) and the imbalance of trade between South Africa and the rest of Africa grew by 14 % in 1992-1997 (McCarthy, 1998:443-444). More recently, in 2002, Africa absorbed about 16% of South African exports while South Africa only imported 4% of its total imports from Africa, indicating a persisting trade imbalance (IMCSA, 2004a:1). It is also argued that Sub-Saharan Africa (SSA) is not a large enough market to provide the opportunities needed for South Africa to overcome its lethargic growth. While it is an important market for increasing growth of manufactured exports, its effective demand is small (SSA's combined GDP is about the same size as Norway). For this reason, South Africa will have to look to the large developed markets if growth performance is to be significantly increased through trade (McCarthy, 1998:443). However, despite this, regional trade and investment should be fostered, as South Africa cannot be 'an island of growth and prosperity ... in a sea of poverty and economic regression' (McCarthy, 1998:443-444).

Greater balance in regional development would occur with increased South African imports from the rest of Africa. There is room for increased imports in products that are currently constrained by South African trade barriers. Examples are textiles, where there is much room for further South African imports, clothing and footwear (McCarthy, 1998:443-444). However, it should be noted that there is increasing competition in this sector from cheap Chinese imports (Lourens, 2004:1).

In the same way that South Africa may use other developing countries as a 'stepping stone' for the development of products, so the reverse may be true for developing countries exporting to South Africa. As McCarthy argues (1998:445) regional exports provide a more favorable environment, compared to the global market, to gain experience in exporting and developing trade. It may be the only realistic way to benefit from economies of scale thus facilitating capital accumulation for further

development. McCarthy (1998:449) argues that South Africa should institute trade on a non-reciprocal basis in favour of African countries with which it trades, as was done for South Africa in the trade negotiations with the European Union. South Africa has offered to lower its tariffs faster than other members, in line with the SADC free trade agreement. Mauritius is the only one to have ratified the agreement resulting from this offer so far, which resulted in a lowering of barriers between these two countries in September 2000 (IMCSA, 2002:1). According to Alec Erwin, Minister of Trade and Industry, South Africa is committed to regional integration, and the steps it has taken to promote trade with the rest of Africa has contributed to the 34.8 percent trade growth per annum on average since 1994; and growth of 30.6 percent per annum with other countries in SADC (Erwin, 2004:1).

2.6 The Development of Value Added and Dynamic Products

In the last section, it was argued that regional trade can be used to develop more technologically advanced products due to the nature of trade in this direction. It is important to examine, however, why it is necessary or prudent for a country to do this. These arguments will be presented below.

The development of high-technology products in developing countries is seen by Hodge (1997:1-2) as 'a necessary step on their industrialisation path.' The importance of primary and resource-based products is declining[7], and technology intensive export structures are more likely to be generators of future growth. These products have faster growth in trade, higher income elasticities, create new demand, substitute faster for older products and have greater potential for learning as new scientific knowledge is more likely to be applied to these sectors. It is also the case that developing countries are increasingly consuming more of these products, so greater domestic production will be a means of protecting their external balance as less will need to be imported (Hodge, 1997:1-2). Simple technologies, by comparison, have experienced a slower market growth, fewer spillovers into other activities in terms of new skills creation and generic knowledge that can be applied to other industries, and have a lower learning potential. These sectors are also the most competitive internationally as competitors are more easily able to penetrate them

[7] Primary and resource based products have seen their share of world exports fall from 1985-1998 (Lall, 2001:95).

(Lall, 2001:90; Nordas, 1997:728).

Technology is also an important way to maintain competitiveness in the face of rising wages. Holden (1993:223) argues that due to the rising unit labour costs in South Africa, it is important to develop new industries that draw on technology that can withstand a rise in unit labour costs. In Dornbusch, Fisher and Samuelson's 1977 model of a continuum of goods (cited in Holden, 1993:224), it is shown that technological change is imperative in the face of rising labour costs 'to maintain competitiveness and shift comparative advantage.' If this does not happen, then the range of competitive goods will decline affecting even traditional exports. Hodge (1997:2) likewise argues that it is imperative to shift comparative advantage into higher technology sectors, otherwise South Africa will lose share in world exports and its imports of these products will increase. This will result in the country becoming increasingly marginalized (Lall, 2001:117). As average wages increase with growth, competitiveness will decline in low technology, labour intensive products. This process can be slowed for a time by applying technology to these products (defensive innovation), but the long-term will see their inevitable decline. It is beneficial in the long run therefore, for a country to move to higher technology products to avoid employment loss by replacing lost output in the lower sectors and creating better paid jobs.

The above arguments provide important reasons why a country should try to develop and become competitive in more dynamic and technologically advanced products. Perez and Soete (1988:474) are able to put forward suggestions on how this can be done. They identify four phases in the life cycle of technology: the introduction (phase 1), early growth (2), late growth (3), and maturity (4). They argue that the first phase (early growth) and the fourth (maturity) provide the best conditions for entry for developing countries. In the early growth stages of a technology's life cycle, little capital and experience is required, but scientific and technical knowledge is important, as is a locational advantage (Perez and Soete, 1988:474). As South Africa does have a good knowledge base, it would possibly be able to enter in phase one. The benefits of entering in this stage are also the development of skills along the way. Entry in the mature phase of a technology's life cycle requires much capital investment, which may be short in South Africa, but there is a greater chance of survival in the race.

Despite this it can be seen that many of the benefits of learning by doing which can be acquired along the way will be lost. As Perez and Soete (1988:475) state, 'the knowledge, the skills, the experience and the externalities required for the various products within a system are interrelated and support each other.' To acquire this 'interrelatedness of technology', it may be necessary to have technology develop endogenously rather than to have it imported exogenously at a later date. Technology in phase 4 may also be on its way out and may be substituted by newer technology. If developing countries are only entering in phase 4 they will always be one step behind. Fast growth requires dynamic technologies that are interrelated, incremental innovation, and spillover effects to other sectors. For these reasons, Perez and Soete argue that it is important to enter new technological systems early.

In South Africa there is evidence of a move to the production of higher technology products, indicated by the long-term decline of some traditional low-tech sectors and the growth of high-technology exports (Hodge, 1997:3). A further indication is the fall in the proportion of high-tech imports between 1991-1995 (although the deficit has continued to grow). Roberts (2002:616-618) similarly finds that while SACU heavily imports mechanical and electrical machinery and motor vehicles, there has also been strong export growth of transport equipment, machinery and electrical machinery.

These trends could be due to South Africa efforts to develop its medium to high-technology industries with protective tariffs. Despite these efforts however, there has been a lack of competitiveness in these industries and this has not resulted in rapid catch up. This is due to the skills shortage and weaknesses in the social capacity to assimilate technology (Nordas, 1997:730). Nordas (1997:730) believes that if improved human capital and R&D efforts were redirected toward adopting foreign technology in potentially competitive industries, then new technologies at earlier stages of the product cycle would probably arise. At present most progress in technology takes place through R&D rather than through learning by doing, but resources to maintain this are insufficient (Nordas, 1997:717-718). Nordas (1997:730-731) contends that South Africa should have a greater trade and ideas exchange globally and work toward adapting products and processes to local conditions while investing in human capital.

South Africa's largest market in high technology products (HTPs) at present is Europe. Demand in Africa is small with many HTP exports to Africa being re-exports by multinationals with little value added. Despite this, South Africa has a comparative advantage in Sub-Saharan Africa due to its location within the region. This provides benefits for backup service (Hodge (1997:7), which suggests that the Sub-Saharan African market may be an important 'launching ground' for the development of high tech products.

2.7 Conclusion

This chapter provided an analysis of South Africa's trade in different directions. It was seen that the bulk of trade is conducted with developed countries and is mainly natural resource intensive. The relationship with developing and regional partners however is interesting in that it is more skill intensive and does not seem to be any more capital intensive (Alleyne and Subramanian, 2001:3,22-23). South Africa's static revealed comparative advantage shows it to have an advantage in agriculture, mining and natural resource intensive commodities relative to the rest of the world and a comparative disadvantage in high-technology products. Dynamically competitive sectors however, are more value added, high-technology sectors (Valentine and Krasnik, 1998:14). As these later products are growing in world trade and are more dynamic from a long–run perspective, it would make sense to encourage the production of these products. This could possibly be done through trade to developing countries, which has been shown to be relatively significant for exports of non-traditional manufactures (Black and Khan, 1998:12; Holden, 1998:464).

Evidence of this is that RSADC is found to have maintained its share of 'rising stars,' compared to rich countries where they have fallen. It is also the case that the share of rising stars in human capital and technology intensive products in total trade with RSADC was relatively high compared to that with rich countries. Edwards and Schoer (2002:1042) argue that this could indicate that RSADC has been used to restructure exports into 'sustainable competitive markets' and, due to the regional comparative advantage in non-resource intensive products, this could promote the production of higher value added sectors. It was noted however that it is important to improve the current balance of trade between South Africa and the rest of Africa.

While the regional market is important for increasing growth of manufactured exports, at the same time it is argued that South Africa will have to look to the large developed markets to significantly improve its growth performance and employment through trade (McCarthy, 1998:443). It is also the case that the skills shortage in South Africa and competition from developed and South East Asian economies in technology intensive sectors may prevent the significant increase of technology and human capital-intensive exports in South Africa. For this reason, Edwards and Schoer (2002:1042) suggest a possible expansion into resource or labour intensive commodities in which South Africa already has a comparative advantage. They also argue however that the best way to exploit the SADC's comparative advantage (as calculated dynamically) would be to encourage trade with developing countries, such as Brazil, China and India, which are technology and human capital intensive. This seems to suggest that South Africa should not follow an either / or trade policy. Traditional exports with developed countries, which are usually more labour intensive, can be used to promote growth and employment, while trade with developing countries can be used to develop more advanced products, which are growing in world trade. This may be a stepping-stone for these products before they can compete in more developed markets.

CHAPTER 3

TRADE AND LABOUR

3.1 Introduction

The aim of this chapter is to discuss the unemployment problem in South Africa and possible factors exacerbating it. This is outlined in Section 3.2. There has been a structural shift in the economy, along with rising skill and capital intensity of production, which is fuelling unemployment. This is covered in Section 3.3., 3.4 and 3.6. The possible causes of these shifts are examined which include the role of trade (Section 3.5) and other factors such as technology, demand and productivity (Section 3.7). The claim that the labour market structure has been fuelling the unemployment problem is examined in Section 3.8. Section 3.9 will present a sample of previous studies done on the impact of trade on labour, mainly for other developing countries. Section 3.10 concludes.

3.2 The Employment Problem in South Africa

South Africa has a massive social and economic dilemma with one of the highest levels of unemployment in the world (Loots, 1998:320). Lewis (2001:69) describes the unemployment problem as 'beyond credibility' and says that compared to other major middle-income economies, South Africa stands apart in this regard. The labour force survey of 2004 (STASSA, 2004:xii) estimated the unemployment rate to be 26.2 percent ,but unofficial sources put it as high as 41 percent (US State Dept., 2005:8). Semi-skilled and unskilled labour makes up around half of the workforce and two-thirds of unemployment. Informal labour accounts for 40 percent of unemployment and there is also unemployed among skilled labour[8] (Lewis, 2001:11).

The capacity of the formal sector to absorb new entrants has dramatically declined over the last 22 years (Loots, 1998:325-327). This has meant that the informal sector has grown in importance as an employment-creating sector (Loots, 1998:327). The explanation could partly lie with the significant structural change South Africa has undergone over the last two decades such as the decline in the relative importance of mining (Lewis, 2001:79) and the fall in employment growth in the primary sectors

[8] See footnote 36 in Chapter 4 to avoid any confusion on this matter.

from 1984 (Edwards, 2001b:50). This will be discussed in further detail in section 3.3. A positive factor is that the pace of decline in employment in the formal sector has bottomed out in recent years, and from March to September 2004, unemployment was found to fall from 27.9% to 26.2%. (SARB, 2002:21; STATSSA, 2004:1). Nevertheless, the country needs to grow at an average annual rate of 6% to be able to reduce unemployment, and between 1994 and 2004 GDP growth only averaged 3% (US State Dept., 2005:8).

An important trend to note is that most jobs have been lost in the lower skilled categories while increases in employment have been among the skilled (Edwards, 2001b:59-60). In Edward's (2001:50) analysis, the share of high skilled employment rose in all sectors between 1984-1997. Semi-skilled and unskilled labour, as a share of total employment, maintained 'relatively constant shares,' while the share of elementary employment fell[9]. Elementary employment has fallen consistently between 1984-1997 and this category is where most unemployment has grown since 1988. The reason is largely due to labour saving techniques and technological change (Edwards, 2001b:59-60). This is in line with new economic growth theories, which argue that modern economic growth creates more employment opportunities for the skilled.

Such a trend is a problem in South Africa where 68 percent of workers in the 'unskilled group' are younger than 34, over half are functionally illiterate and 87 percent are not trained or do not have skills for a specific job (Loots, 1998:323). Loots (1998:323) also finds that 96 percent of the unemployed do not possess a post-school qualification and the system does not provide school leavers with skills demanded by the labour market. The lack of skills is a major obstacle to be overcome if the unemployment problem is to be improved in South Africa. This problem points to socio economic factors i.e. poor access to quality education, primary health care services and housing, which result in poor productivity and competitiveness, thus contributing to the rising unemployment (Schoeman and Blignaut, 1998:316).

[9] Elementary labour includes those involved in mining, construction, agricultural labourers, domestic servants, sweepers, street vendors etc (Edwards, 2001b:52).

3.3 The Impact of Structural Change

It has been mentioned above that contributing to unemployment has been the structural change in the economy. This section examines this change in more detail. Structural change is the relative change in the contribution to GDP of the main economic sectors (Bhorat *et al*, 1998:5). It is due to different rates of sectoral growth in the economy as a result of changing profitability and productivity in sectors (Bhorat and Hodge, 1999:348-50). The impact of structural change on employment arises as production moves from sectors that may be labour intensive, for example, to sectors that are more capital or skill intensive. The impact of structural change on employment is thus directly linked to the concern with rising demand for capital and skilled labour and the decline in the labour intensive sectors. It is important to note, however, that this trend is not only linked to the change *between* sectors (which we are referring to here as 'structural change'), but also to a change in production techniques *within* sectors themselves. For example, the increased demand for capital and skilled labour and the decline in use of unskilled labour does not necessarily mean that labour intensive sectors are declining: it could mean that these labour intensive sectors are increasing their use of technology and using more capital and skilled labour. This is a change *within* a sector rather than *between* sectors. This distinction is important as it is used to establish the cause of factor intensity trends, which are fueling the unemployment problem.

When observing structural shifts in terms of changing GDP shares by sector in South Africa, it is found that there has been a clear structural shift in the economy, which is in line with global trends. Between 1970-1996, there was a drop in the once leading primary sector (agriculture and mining, fishing and forestry)[10], which has had the lowest sectoral output growth rates in the period[11]. Manufacturing, which surpassed the primary sector as the main contributor to GDP, saw its share of output fall between 1984-1993 (Edwards, 2001a: 472) and after trade liberalisation, the sector experienced negative growth from 1995-1997 (-0.5%) as traditional sectors declined with increased international competition (Bhorat *et al*, 1998:9). However, overall manufacturing has maintained its share of GDP at around 23-24%, while services

[10]The drop has been from 18.6 percent in 1970 to 11.9 percent in 1997 (Bhorat and Hodge, 1999:360)

[11] Although agriculture is volatile, it experienced negative real growth from 1980-1995 with the recovery from 1995-1997 being a 'deviation' from the trend. In mining, gold, which is the largest component, is in 'irreversible' long-term decline (Bhorat *et al*, 1998:5).

have increased their share from 50.2% in 1970 to 58.6 % in 1997 (Bhorat and Hodge 1999:361-363; Edwards, 2001a:472). While manufacturing is still the largest single sector in the economy, it already has a deep penetration of the domestic market, so any increased growth would have to come from increased exports (Bhorat *et al*, 1998:8-11).

Services have experienced fast growth over the last few decades in South Africa, and indeed grew faster than GDP between 1970–1997, apart from transport and communications) (Bhorat *et al,* 1998:11). Bhorat *et al* (2001:12) argues that this growth has been a driver of GDP and has compensated for falling primaries. The main growth areas have been financial and other business service sectors and the proliferation of communication and IT services (Edwards, 2001a:472). Bhorat *et al* (2001:12) contends that South Africa 'is well placed to exploit opportunities in a sector that is growing faster than any other in the world economy.'

It seems that recent economic growth is also benefiting the service sector, such as finance, trade and community services, and this is where employment is being created. This is evident from the Labour Force Survey (STASSA, 2004:vii) where the combined employment of these two sectors is higher than any other, and employment growth between March and September 2004 was greatest after Construction. This contrasts to sectors such as Agriculture and Mining, which have both seen significant reductions in employment in this period. The employment decline in these sectors is noted by Edwards (2001b:50) from 1988 to 1997 as well, and he attributes this largely due to poor performance of mining and shedding of labour in agriculture. Although structural change impacts on employment, it is only an effect, and it is important to establish the main cause of structural change itself: for example, is it being caused by trade, changes in final demand or technology changes? This will be examined detail in section 3.7.

3.4 Capital Intensity in South Africa

It has been mentioned above that the structural shifts in the economy are related to rising capital and skill intensity. Researchers are unanimous in their agreement that production has become more capital intensive in South Africa, and despite the apparent abundance of labour, the capital–labour ratio has increased by 142.8% from

1970–1995 (Bhorat *et al*, 1998:12). Alleyne and Subramanian (2001:3) contend that, between 1989-1997, the rising capital intensity does not seem to have abated and is probably still increasing. Increases in capital intensity in South Africa have been mostly in mining, agriculture, construction and manufacturing respectively, while the service sectors have seen small increases in capital relative to labour. In fact, the only sector with a decline in the capital-labour ratio was the financial and business services sector (Bhorat and Hodge, 1999:354). In manufacturing the capital intensity has arisen from the comparative advantage in the beneficiation of natural resource industries (which are capital intensive) and the subsidisation of capital by the Industrial Development Corporation (Bhorat and Hodge, 1999:354). The rising capital intensity in the economy is against the labour intensive export drive envisaged by the Growth Employment and Redistribution strategy (GEAR) (Edwards, 2001a:487-488). Even so, Lewis (2001:24) argues that little has been done to encourage less capital intensive non-mineral exports through export processing zones or duty drawback and rebate schemes.

As capital intensity impacts on labour demand, it is important to ask what is causing the rising capital intensity in South Africa. Arguments include South Africa's natural resource base (which is capital intensive), past governmental distortions, supply-side policies promoting the production of capital–intensive sectors, and the methodology used to measure capital intensity. There is also the claim that there is not an increase in capital intensive sectors so much as a relative decline in ultra-labour intensive sectors (Edwards, 2001a:488). Other factors are low labour productivity, wage rigidity and the costs of compliance with labour market legislation (Alleyne and Subramanian, 2001:23).

Capital intensity is rising across all sectors, so other causes could be technology and factor prices (Edwards, 2001a:488). This would include factors such as computerisation (Bhorat *et al*, 1998:12). The rise in the use of technology would also presumably require a higher demand for skilled rather than unskilled labour. For this reason it is argued that the rising capital intensity could be pointing to a correlation between capital and skilled labour. However, it could also be that international competition may have forced the increased capital intensity through defensive innovation as firms struggle to compete against imports. This is a trade related

argument and will be elaborated on in the following section.

3.5 The Impact of Trade on Labour Demand

Rising imports of a more labour intensive nature seems to indicate that South Africa is less competitive in labour intensive products relative to some countries. Highly Performing Asian Economies (HPAEs) dominated the low wage labour intensive sectors in the 1960's–70s, after which they moved up into higher value added products. Countries like Bangladesh, Indonesia, Pakistan and China have since moved into the lower value added end of the market and South Africa seems unable to compete in this arena (exports in the ultra-labour intensive sectors are contracting). It would follow that production and exports are likely to move away from labour intensive products with increased penetration in these sectors. This is likely to cause a reduction in labour demanded per unit produced.

This is indeed what is found by Bell and Cattaneo (1997:24) for manufacturing. While this sector drew strongly on labour in 1975-80, between 1990-93 the pace slowed down considerably and total employment fell annually during this period (Bell and Cattaneo, 1997:6). Although trade reforms increased employment in the capital intensive sector within manufacturing between 1985-1993, the labour and ultra labour intensive sectors faced employment declines so that manufacturing employment as a whole declined (Bell and Cattaneo, 1997:23). This is observed as a rise in capital intensity and a decline in labour intensity which has already been referred to.

One would expect the rising capital intensity and declining labour intensity of exports to have a negative impact on employment, and again this is confirmed by Bell and Cattaneo (1997:7, 19). Although exports still increased employment in manufacturing between 1985-1993, the reductions in the labour coefficients of exports (i.e. the amount of workers per million rand of exports) reduced the rate of growth of employment expansion that exports can generate (Bell and Cattaneo, 1997:19)[12].

[12] The shift in the factor intensity of trade, according to Bell and Cattaneo (1997:19), resulted in employment being 6.58 percent lower than it otherwise would have been in manufacturing during 1985-93.

Employment in manufacturing fell between 1985-1993, despite the rise in manufacturing exports, and the greatest cause of this fall is import penetration (Bell and Cattaneo, 1997:19). This is supported by Bhorat (2000:8-9) and Jenkins and Sen (2002:26). Bhorat finds that from 1988-1997, net trade decreased overall manufacturing employment, whereas before this date (1970-1987) it had induced a positive effect. He argues that the high import penetration is 'the key reasoning behind the high attrition rate for unskilled workers.' Jenkins and Sen (2002:26,33) find that employment losses in manufacturing due to trade liberalisation in the 1990s are far greater than employment gains, with losses being equal to around 14% of total employment in manufacturing in the early 1990s. Bhorat (2002:8) and Bell and Cattaneo (1997:27) conclude that trade liberalisation and the tariff phase down under GATT since the late 1980s have significantly reduced the total manufacturing employment level, leading to the conclusion that a liberalised trade strategy may be detrimental to employment creation in South Africa. It could be the case, however, that trade liberalisation may only have accelerated the decline of the ultra labour intensive sectors, which were experiencing problems in export performance and with import penetration before trade liberalisation (Edwards, 2001a:482).

Edwards (2001b:65) contends that trade liberalisation is not responsible for the main part of the rising unemployment in South Africa, as jobs lost through import penetration have been matched by export growth. As far as import penetration and employment is concerned, Edwards and Golub (2004:5) argue that capital-labour substitution played a greater role than import penetration in the drop in employment in manufacturing in the 1990s. Similarly, Tsikata (1999:8) believes that import penetration has not been 'deindustrialising,' with domestic production remaining 'relatively resilient' in the face of trade liberalisation since 1993. However, Tsikata does note the increased concern for the rising job josses from mid-1998. Similarly, Edwards (1999:13) admits that the responsibility of trade for the increasing capital intensity is not clear, and as imports have penetrated the labour intensive sectors the most, this has increased the skill bias of net trade since 1993.

In support of trade, there is the view that trade liberalisation will initially increase import penetration, and technology will increase total factor productivity (TFP) in the country. This may result in job losses in the short run, but in the long run this will

result in increased economic growth and labour demand, as producers become more competitive and jobs expand with exports (Jenkins, 2002:4). This is due to the dynamic benefits that arise from trade, which include higher labour productivity in exports, increased efficiency (due to greater competition), access to equipment and inputs and greater diffusion of technology (Edwards, 2002:49). The decline in employment in South Africa at present is largely due to trade induced efficiency gains as trade has impacted positively on global competitiveness, but this greater competitiveness could result in further output and employment in the future (Edwards, 2002:43).

In line with this, is the argument that the negative impact trade has on workers in sectors that are contracting is temporary and should be managed with assistance to move to new jobs, aid to affected regions and attempts to increase the flexibility of the labour market (Wood, 1997:3). Wood (1998:1475) contends that with modernization, the excess supply of unskilled labour will partly be absorbed into the service sector with a fall in its relative wage, or become unemployed. In Europe (with more rigid wages) there was more unemployment, while in the U.S, with a more flexible labour policy, absorption into other sectors at a lower wage was predominant.

This highlights the importance of the labour market when assessing employment as it can influence whether changes occur in wages or in employment following demand shocks. In the study on Italy by Bella *et al* (2000: 307), it was found that rather than wages adjusting, it was rather employment that changed due to the nature of the labour market. As South Africa has a fairly rigid wage structure, with wages being negotiated by trade unions, it is also likely that demand shocks will result in increasing unemployment rather than wage adjustments. Section 3.8 will look at the labour market and wages in South Africa and examine whether it is exacerbating the unemployment problem.

Although the above approach relies on some strong assumptions, which once relaxed, mean that it is no longer certain that trade liberalisation will lead to greater employment, Jenkins (2002:4,18) provides evidence to support the argument. Jenkins (2002:18) found a negative impact of trade on employment from 1990-1994 (before trade liberalisation), which becomes positive from 1994-2001. A positive impact is

also found by Edwards, (2001:54) from 1993 to 1997. Edwards (2001b:54) argues that exports raised total employment between 1993-97 by 5.3 percent, while net trade was less impressive at 0.96 percent due to import penetration (and it is negative if the primary sector is excluded). Findings by Bhorat (2000, cited in Jenkins, 2001:18) however, find the impact of trade on employment to be negative, both before and after trade liberalisation. Jenkins argues that Bhorat's period of study was not as extensive and so he may have failed to capture the positive effects on employment. However, the positive impact of trade on employment, which was found by Jenkins and Edwards, was small, both in absolute terms and compared to technological change, so that even if trade does have a positive effect on employment, it is unlikely to reduce unemployment by much (Jenkins, 2002:28). Indeed, Edwards (2001b:57) argues that employment growth generated by exports is less than the growth in population so that in would be insufficient to decrease unemployment in South Africa.

It is also worth bearing in mind, that even if the direct impact of trade on labour creation is found to be negligible, trade may have ameliorated decline (Roberts, 2000:628). When output and domestic demand decline, exports may provide an alternative market to soften the impact of the decline. Trade also has other positive spin-offs, which make exports and the production of tradable goods essential for development and economic performance. Trade encourages the more efficient use of labour force skills and it encourages a faster rate of learning, which allows development to be sustainable (Wood, 1997:21). It is also the case that even if export growth is not an engine of economic growth itself, it is essential to provide the foreign currency necessary to purchase imports. Imports are often the inputs required for investment in physical and human capital necessary to facilitate growth (McCarthy, 1998:448). As well as being important generators of foreign exchange, exports allow industries to benefit from economies of scale, specialization and access to new technologies and are also an indicator of industrial efficiency in a country (Lall, 2001:87). It is because of the widely accepted benefits of trade that South Africa, along with many other countries, has undertaken extensive trade liberalisation in recent years.

3.5.1 Trade and Capital Intensity

Although there is evidence that trade has contributed somewhat to the structural change in the economy towards more capital intensive sectors, the degree to which trade is responsible for this shift is unclear (Alleyne and Subramanian, 2001:23). Nevertheless, it is the case that trade liberalisation may cause the factor intensity of trade to change. With trade liberalisation in developed countries, skill-intensive activities, like services, tend to increase their share in exports, while more labour intensive activities tend to be imported from the less developed regions thus increasing the labour intensity of imports (Wood, 1998:1466). This would impact negatively on unskilled labour in these countries[13]. The opposite would be true for a developing country.

South Africa is a middle-income developing country and according to a World Bank study (1995:52, cited in Bell and Cattaneo, 1997:8) is expected to have labour intensive exports. South Africa seems to be increasingly deviating from this expected pattern with its comparative advantage not falling in labour intensive products (Bell and Cattaneo, 1997:8-9). In fact, the country seems to be following the pattern of the developed countries with exports becoming more capital and skill-intensive and imports more labour intensive. One factor causing this may be the fact that South Africa's trade to developing countries, notably the rest of Africa, has increased from 1.9% in 1990 to 16.9% in 1998 (Jenkins and Sen, 2002:3). As regional exports are capital intensive (Edwards and Schoer, 2001:11) and South Africa does not have a comparative advantage in unskilled labour with these relatively lower wage countries (Jenkins and Sen, 2002:3), increased regional trade would bring about rising capital and skill intensity of trade.

Although this might be the case, Alleyne and Subramanian (2001:1) find that even with its high-income partners, South Africa shows a capital intensive trade structure. This could be because, with trade liberalisation, South Africa is being 'squeezed from both ends,' competing against low wage countries such as India and China in unskilled labour intensive goods and highly productive developed countries in more

[13] Sachs and Shatz (1996, cited in Wood, 1995:64) found that for the U.S., trade with less developed countries caused output in manufacturing to fall mainly in unskilled sectors, which reduced employment in manufacturing.

advanced goods. The increase in competition may result in defensive innovation and capital upgrading in an effort to compete (Edwards, 1999:1). Golub (2000:16) argues that South Africa's main competitors in developed country markets are other developing countries. As South Africa is not competitive in terms of unit labour costs (wages adjusted for productivity differences) against these countries, they appear to 'have a serious labour cost problem'[14]. This means that trade liberalisation has led to rising capital intensity in South Africa as firms attempt to compete through higher productivity and efficiency, and 'through a leaner, more skilled work force,' (Bhorat, 2000:9). Although the increasing skills bias and capital intensity may indicate an attempt by South African firms to be competitive in the global arena, it could also be due to other factors such as relative wage shifts or global skill-biased technological change (Edwards, 2001b:66).

3.5.1.1 Measurement of Capital Intensity

A mention should be made on the criticisms of the measurement of capital intensity, as this will affect the reliability of previous work in this regard. Wood (1997:76) argues that the most appropriate measure to be used is the capital-output ratio (not the capital-labour ratio) as used in most studies. This is because it preserves the relationship demanded by the H-O theorem between relative factor prices and relative goods prices. This is not necessarily the case with the capital–labour ratio, as labour is not homogenous. The capital-output ratio will ensure that the higher the price of capital, the higher the price of capital intensive goods relative to less capital intensive goods. The capital-labour ratio is not a reliable measure of capital intensity because labour is not homogeneous and there are different levels of skill intensity (Wood, 1997:76-77). For example, it is possible for a sector to be both capital and skill-intensive. If a sector has a relatively high capital to labour ratio, a rise in interest rates would increase the price of the sectors output, but if the sector is also more skill-intensive, a rise in interest rates may also cause a fall in the relative price of the sectors output. The relationship between relative factor price and relative goods prices is not preserved. If the capital-output ratio is used, the higher level of skill will reflect in a lower capital-output ratio (Wood, 1997:78).

[14] Golub (2000:16) argues that for almost all developing countries, even higher wage countries like Brazil and Korea, South Africa's unit labour costs are higher.

The result of this is that some studies of North-South trade in manufactures infer differences in capital intensity of exports and imports from differences in capital-labour ratios whereas if the capital-output ratio had been used, there would have been no difference found in capital intensity. The difference that is being shown is due to skill intensity rather than capital intensity. In cases where capital intensity remains, interpretation becomes difficult due to a positive correlation between capital and skill intensity across manufacturing sectors which seems to be a 'feature of industrial technology' (Wood, 1997:79). As one cannot argue that South Africa is capital intensive by using the capital-labour ratio to measure capital intensity, the positive correlation between exports and the capital-labour ratio to both high, middle and low income countries which was found by Alleyne and Subramanian (2001:7) may not be conclusive.

3.5.1.2 Capital Intensity and Comparative Advantage

Wood (1997:80-81) supports the hypothesis that trade is based only on differences in skill availability. He argues that capital intensity does not influence trade (it does not bestow comparative advantage) and any association is coincidental. This is due to the large evidence of skill differentials between North and South and no evidence of capital differentials. Although Wood argues that the global mobility of capital should not affect the pattern of trade, he does note exceptions such as sustained divergence between domestic and international interest rates or long-term differences in infrastructure. If a country has a comparative advantage in capital intensive goods, it may appear that they are exporting capital, but more often there will be a correlation between skill and capital intensity or the country's exports may be based on capital intensive natural resources (Wood, 1998:83). This may indeed be the case in South Africa with many natural resource intensive exports. However, even if capital intensity doesn't influence trade, trade may still be contributing to rising capital intensity due to its correlation with skill.

It should also be remembered that rising capital intensity is natural in a growing economy. To maintain global competitiveness, capital is used to increase productivity to compensate for rising average wages, which arise due to growth (Bhorat *et al*, 1998:11). Rising capital and skill intensity is part of a process of improving competitiveness in a globalised trading environment. However, even if South Africa

is trying to increase its competitiveness, export growth has been mediocre relative to other middle-income countries (Edward and Schoer, 2001a:30), and increases in employment witnessed recently have been small (STATSSA, 2004:xii). It may be that South Africa is not sufficiently competitive at present to bring about the increases in trade required to impact significantly on employment.

3.6 Skilled and Unskilled Labour Intensity

It has been mentioned that the structural shift in the economy has been accompanied by rising capital and skill intensity, which is contributing to growing unemployment for the unskilled. This section will assess the role of trade in bringing about the rise in skill intensity. Although South Africa's net exports are unskilled labour intensive, there is evidence that there has been a shift in exports toward skill-intensive activities (Alleyne and Subramanian, 2001:22). The period 1993-1997 saw a growth in the use of skilled workers in manufacturing exports, while the demand for unskilled labour has declined (this is also the case in manufacturing in general) and the gap between skilled and unskilled labour is growing (Bhorat, 2000:8). Indeed, Lewis (2001:47) argues that in manufacturing, there is a low and declining share of exports that use unskilled labour and a relatively high share using skilled labour. Bhorat (2000:8) concludes that tariff liberalisation has only benefited skilled workers, and in line with Bell and Cattaneo (1997:11) [15], he argues that the period of protectionism and limits on import substitutes in manufacturing in South Africa was beneficial to the use of unskilled labour.

Further support for growing skill intensity is provided by Edwards (2001b:64; 1999:6), who finds a positive correlation between export growth and skill intensity between 1993-1997 that had not been there between 1984-1993. Such a relationship is not apparent with regard to imports (Edwards, 1999:6). The relationship suggests a link between trade and skill intensity: as exports grow, so will skill-intensity. A positive correlation is also found by Alleyne and Subramanian (2001:11) between net exports and the ratio of skilled to unskilled labour but this is only for exports to low-income countries. It is negative for high-income countries. As rising skill intensity is in line with an economy wide shift to more skill-intensive sectors (Bhorat et al, 1998),

[15] Bell and Cattaneo (1997:11) argue that if white labour is taken as a proxy for skilled labour, then exports are moving away from the use of unskilled labour (with a movement towards increased demand for white labour as opposed to black labour) between 1985-1993.

the cause of this trend is not straightforward (Edwards, 1999:2). Contributing factors could be technology flows from the North to the South, which tend to increase the demand for skilled labour (Jenkins and Sen, 2002:4). For this reason one would expect a correlation between rising trade, skills and technology.

The rise in skill intensity and the growing gap between skilled and unskilled labour has led to the fear that trade is hurting unskilled labour. It has been argued that international trade, as well as adversely affecting wages and employment of the unskilled by encouraging technological change, increases their employment elasticity, which makes them increasingly vulnerable to economic shocks. Increasing elasticities also reduce the bargaining power of trade unions, which mainly represent unskilled labour (Jenkins, 2002:34). An assessment of wage elasticities of employment in the 1980s–'90s in South Africa, found increasing elasticities in key sectors such as mining, manufacturing and construction (Fields *et al*, 1999, cited in Jenkins, 2002:25). It is also true that although rich and poor countries gain from trade according to traditional theory, the benefits are often unevenly distributed within the country, and the structural adjustments are often costly to workers in previously protected industries (Hodge and Nordas, 2001:95). One cannot assume, however, that it is trade that is causing the growing gap between skilled and unskilled labour, as there are many other factors which impact on labour demand.

It should also be noted that there is also the argument that despite any growing gap between skilled and unskilled labour, the demand for unskilled labour has still increased as well. Jenkins and Sen, (2002:4) find that the percentage of unskilled labour intensive sectors in exports increased from 5% in the late 1970s to an estimate by Jenkins (2002:11) of nearly 10% of total manufactured exports in the 1990s when classified appropriately. The rise of unskilled labour in exports is also noted by Dias (1998:18), Pretorius (2002:16), Fedderke *et al* (1999:15), Cassim *et al* (2002:123) and Edwards and Schoer (2002:1040). The latter two papers find the increase in use of unskilled labour is mainly in exports to developed countries. This is expected as according to the HOV theorem, South Africa, which has a greater supply of unskilled labour, should export such goods to developed countries. As trade in general has been liberalized after the 1994 Uruguay Round and these blocs still account for the majority of South Africa's trade volumes, this may explain why there has been a

continued increase in the quantity of unskilled labour in exports. If this is the case, then continued trade with developed blocs is necessary to assist increasing the demand for unskilled labour. Despite the decline in the demand for unskilled labour claimed by Bhorat (2000:8) in manufacturing, he too finds that for the economy as a whole, trade has led to increased employment for all occupations and skill levels.

Although there may have been an increase in unskilled labour demand, Edwards and Schoer (2002:1040) argue that it is still low. It is also the case that the skilled and semi - skilled have benefited far more than the unskilled (Bhorat, 2000:8). Authors such as Jenkins and Sen, (2002:22), Tsikata (1999:8-9), Hayter e*t. al*. (2001 cited in Jenkins and Sen, 2002:3), and Jenkins (2002:11) all find that unskilled labour still only makes up a small part of total exports of manufactures. In fact, the labour content (or the number of jobs generated by a thousand dollars of exports and imports) has hardly changed from 1970 to the 1990s (Jenkins and Sen, 2002, 22). This means that the overall impact of trade liberalisation on employment is likely to be small (Edwards, 2002:43).

3.7 Overall Impact of Trade and Other Factors on Labour

Studies done by Bell and Cattaneo (1997:23-24) and Edwards (1999:8) use shifting factor intensities to examine the impact of trade on labour. While Bell and Cattaneo (1997:23-24) argue that trade impacts negatively on manufacturing employment in South Africa and especially on those in low wage sectors, a different view is taken by Fedderke *et al* (1999:25) and Edwards (2001b:43). These authors contend that the methodologies used in studies such as Bell and Cattaneo (ibid) and Edwards (1999:8) do not explain if the shifts in factor intensity that have occurred are due to trade or to other factors such as demand, technology, labour productivity, real wages or investment flows. The studies assume that it is the changes in trade flows that cause the domestic production structure, in that demand from trade determines what is produced in the country. As the export market is often used as a 'vent for surplus' (that is, it is not considered to be more important than the domestic market) and as imports are intensive in capital and intermediate content, it is, according to Edwards (2001a: 475; 2001:43), problematic to assume a direct causation from trade to changes in domestic production. He argues demand from trade cannot be separated from domestic demand. (Edwards, 2001b:43).

Edwards (1999:8) contends that many studies such as Lawrence and Slaughter, 1993, Baldwin and Cain, 1997, Berman, Bound and Griliches, 1994; Lawrence, 1983 and Greenlagh *et al*, 1998, find the impact of trade on employment to be small or small relative to other factors such as technology or changes in final demand. Edwards (2001b:45-46) formulates a model that enables an examination of the impact on occupational employment due to changes in final demand, trade flows or technological change[16]. It is found that technology and domestic demand are the greatest influences on the level of employment and skill structure (Edwards, 2001b:43). Table 3 below shows the main forces affecting employment in South Africa until 1993.

Table 3: Forces Affecting Employment

	1984-1988	**1988-early 1990s**	**After 1993**
Negative effects	• **Technology** *(cause of most of the fall in employment)*	• **Final Demand**[17] *(cause of 67% of fall in unemployment)* • **Technology**	• **Technological change & rising skill intensity** *(responsible for most of the fall in employment)*
Positive Effects	• **Demand** *(Agriculture & Services)* • **Exports** (+2.6%)		

Own compilation. Data sourced from Edwards (2001b:53; 2002:2)

From the above table it can be seen that technology and final demand played a more important role than exports in influencing employment from 1984. It seems that the only role exports had, was to increase employment (by 2.6 per cent between 1984-88) [18]. After 1993, trade did have a greater impact in expanding employment, increasing it by 5.3 percent, with key sectors being agriculture, manufacturing and indirect effects on services. If job losses due to import penetration are taken into account

[16] Technological change is interpreted as 'changes in labour embodied in intermediate goods purchased by firms as inputs, as well as changes in the labour coefficient of gross output.' (Edwards, 2001b:48).
[17] Although demand recovered in 1993, the impact of technology led to a 3.6 per cent fall in employment (Edwards, 2001b:53)
[18] This was mainly due to the export growth within manufacturing having an indirect impact on transport and communication services, indicating the importance of including indirect effects (Edwards, 2001b:53). The inclusion of indirect effects increases the impact of each factor on gross output growth in almost all sectors and particularly in the service sector where indirect effects 'more than double the direct effects,' (Edwards, 2001a:480).

however, net trade only increased employment between 1993-'97 by 0.96 percent[19] (Edwards, 2001b:53-54). This leads Edwards (2001b:53) to conclude that 'it is not trade flows but final demand and technology that are the primary sources of change in employment,' but he does state that despite its smaller role, trade has still been a significant influence on employment[20].

There are other studies (Bhorat and Hodge,1999:367-368; Edwards, 2002:2; Bowles,1995, cited in Edwards, 2001a:486), which support the finding that within sector shifts (largely due to technology), have a greater influence on occupational labour demand in comparison to between sector shifts (largely due to trade). Shifts between sectors would be, for example, a move in production away from the agriculture sector to the machinery and equipment sector. This, it is argued, is caused more by trade. Shifts within sectors would be shifts within the agriculture sector itself. For example, increased used of machinery within agriculture would mean shifts away from the use of labour in agriculture. Such within sector shifts, it is argued, are caused by technology related factors, rather than trade.

The above mentioned studies (Bhorat and Hodge,1999:367-368; Edwards, 2002:2; Bowles,1995, cited in Edwards, 2001a:486) find that the rise in capital intensity has largely been within sectors rather than between sectors and that these shifts are the predominant cause of the rising skill intensity of employment in manufacturing and services. A similar finding by Bhorat *et al* (1998:14) is that the factors causing changes in the type of labour in order of importance are: economic growth, productivity improvement, production method changes and structural change. They argue there are few exceptions to this hierarchy. As the impact of trade is largely indicated by structural change (change between sectors), one can suggest that trade has a smaller role than technology in influencing the type of labour demanded.

Despite the criticism of Bell and Cattaneo's (1997:10) work, their research also suggests that technology has had a greater role in influencing employment than trade.

[19] It was only positive due to low import penetration in the primary sectors (agriculture, forestry and fishing and mining and quarrying) (Edwards, 2001b:54).

[20] This finding seems to apply to developed countries as well. A study by UNIDO (1986, cited in Wood, 1997, 106-107) which measures the effect of trade on labour for Northern countries, found that 'trade is a minute source of change in total industrial employment' and that domestic demand and productivity are likely to have a much greater impact on employment than changes in trade.

This is determined by the fact that shifts *between* sectors (commonly ascribed to trade) toward more capital intensive production, have much less of an impact on labour than the declining labour coefficients *within* sectors, which is commonly ascribed to technology or relative factor price changes [21] (Edwards, 2001a:487). The same is true for imports (Edwards, 2002:2).

With regard to the influence of productivity on employment, Jenkins (2002:18-24) finds that increased productivity was a major factor contributing to reduced employment in the 1990s. This was in analyses of the impact of various factors (domestic demand, exports, import penetration, productivity and net trade) on different skill levels (highly skilled, skilled, semi and unskilled) over the period 1970–2001 for manufacturing. Productivity had the greatest negative impact on all labour groups, while trade is found to impact positively on all groups after 1994, particularly on skilled and more so for highly skilled. Although rising productivity may have reduced employment, rising productivity is necessary to drive economic growth (Bhorat *et al*, 1998:12, 16). Such increases may have short-term consequences in terms of job losses, but Bhorat *et al* (1998:16) argue that higher productivity will increase the demand for labour across all occupations in the long run. It is important however, that wages should be kept in line with productivity.

Most studies find that skill biased technical change accounts for most of the rise in the relative demand for skilled labour[22]. However, Wood's (1998:1477) contention is that this is not the main concern. He argues that the conflict between the trade and technology views of the causes of rising inequality are narrower than supposed and should be confined to the cause of *acceleration* of the rate of growth of the demand for skilled labour. The fact is that there has been an acceleration in the rise in the demand for skilled labour and the issue is what the main contributor to the *acceleration* has been: is it due to trade or to an exogenous acceleration of skill biased

[21] Bell and Cattaneo (1997: 10) separate the effects of changes in the weighted average labour coefficient of exports resulting from shifts *within* sectors away from labour and shifts *between* sectors to less labour intensive sectors. They find that shifts between sectors reduced the labour coefficient of exports by 3.84%, while shifts within sectors reduced it by 8.35%. As shifts within sectors are argued to be largely due to technology, this provides evidence that technology has a greater influence on unemployment than trade.

[22] This is evident because the demand for skilled labour has risen in trade and non-trade sectors alike (Wood, 1998:1477).

technical change? Wood believes that it is more due to trade. Looking at the U.S., Wood points out that technology (skill biased technical change) has caused a *rise* in the demand for skilled labour while trade explains the *acceleration* in the growth of demand over the last two decades. Regardless of whether trade or technology is to blame for the declining demand for unskilled labour, most economists agree that training, education, income redistribution and the use of taxes to increase the demand for unskilled labour is preferable to reverting to trade barriers and protection (Wood, 1998:1479).

The division itself between trade and technology is also a tenuous one. Even though most studies on the effect of trade liberalisation on employment in South Africa are unanimous in advocating that it is technological trends rather than trade that is causing unemployment among the unskilled, trade is intimately linked to technological transfer itself (Edwards, 2002:3, 18). For this reason, Wood (1997) objects to the division of trade effects and technology effects. Increased trade liberalisation may itself bring technological change as a country is exposed to more developed markets. Wood (1997:108) contends that many studies which find that trade has a very small effect on the demand for labour, are often based on the assumption that foreign trade does not influence labour productivity changes, which are exogenous. He criticises this assumption, claiming that as firms struggle to compete in a global environment, they may undertake 'defensive innovation'. This involves adapting production, using fewer unskilled workers and more skilled workers to raise productivity in order to fight off imports[23]. This displaces unskilled workers and drives down their wage or raises unemployment where wages are rigid (Wood, 1998:1466). This may be interpreted as within sector shifts (due to technology) but in fact the shifts are due to trade. Trade may also increase technological transfers or the imitation of foreign technology, which will increase the demand for skilled labour (Edwards, 2002:3, 18).

Weak evidence for defensive innovation at industry level is that firms that are more skill intensive have been less affected by trade liberalisation (in terms of market share) than those that are relatively unskilled labour intensive (Wood, 1998:1466).

[23] For example, in South Africa, increased import penetration in the late 1980s may have brought about changes in production methods and greater use of technology, which may have affected the demand for labour (Bhorat, 2000:9).

This means that if a firm is more skill intensive, it will be able to compete more effectively globally. There will thus be an incentive for less skill intensive firms to undertake defensive innovation and enhance skill intensity. Further evidence for this is that in a study analysing two firm level surveys[24] it is found that, with trade liberalisation, less skill intensive firms had improved competitiveness. It was also the case that firms that experiencing significant improvements in competitiveness had a greater likelihood of increasing skilled technical employment than other firms (Edwards, 2002:15). This rise in competitiveness through the use of more skilled labour is possible evidence for defensive innovation, although this is not conclusive.

Defensive innovation may also be indicated in factors such as changes in the efficiency of labour use, shifts in the labour intensity of products and changes in the own-price elasticity of labour demand. To assess this, these factors are included in a regression model by Jenkins and Sen, (2002:28). Trade induced changes in output are controlled. They find that trade reforms (since 1994) have positively impacted on employment due to a shift toward *labour intensive* techniques following import penetration. This is evidence against defensive innovation, which would have predicted a shift to more skilled / capital-intensive techniques. Although export orientation has a weak positive effect on the efficiency of labour use, there is not much of an effect on the wage elasticity of employment in South Africa (Jenkins and Sen, 2002:32). Defensive innovation would bring about increased wage elasticity of employment. This evidence therefore does not support the idea of defensive innovation.

As mentioned, the fact that firms most affected by trade liberalisation (ultra labour intensive firms) showed improved competitiveness in the surveys cited by Edwards (2002:15) could be evidence for defensive innovation. In other words, as they are faced with rising import competition, they are forced to improve their competitiveness, which they do by increasing their use of skilled labour and technology. On the other hand, this could equally be reflecting South Africa's increasing trade with other developing countries, who will demand more skill intensive goods. It could also be due to the assimilation of foreign technology by

[24] That is the National Enterprise survey (late 1999) and the World Bank and Greater Johannesburg Metropolitan Council (GJMC) survey, (Edwards, 2002:9).

local exporting firms (Edwards, 2002:15). Edwards (2002:4) argues that 'it is unclear to what extent technological change is being driven by global skill biased technological change…sector biased technological change…'defensive innovation'…or trade induced technological transfers.' He concludes that it is likely they all play a role and it is hard to separate the effects from each other. The defensive innovation argument shows the difficulty of separating trade and technology effects.

3.8 Labour Market

Experience shows that a flexible labour market is an important adjunct to trade liberalisation and macroeconomic stabilisation; without which unemployment can worsen (Golub, 2000:14; OECD, 1999:156-9). One of the reasons for the lack of international competitiveness by South Africa, which is exacerbating unemployment, is the inflexible and fragmented labour market (Golub 2000:14; Nattrass, 1998:19; 2001:5; McCarthy, 1998:447)[25]. Preliminary evidence of this is that with skill biased technological change in South Africa, the relative wage of less skilled labour should have fallen[26]. This has been the case in other developing countries either due to trade or technology. In South Africa the opposite has occurred with the relative wage of less skilled labour rising since 1970. This rise has been accompanied by a decline in the employment of less skilled relative to skilled labour (Abdi and Edwards, 2002:12)[27]. We therefore have a situation where wages of unskilled labour are rising faster than productivity while demand for such labour is falling and unemployment is growing (Lewis, 2001:iii; Abdi and Edwards 2002:19). This goes against economic theory and has been attributed to non-market forces including labour legislation, unions, and real wage growth (Fedderke *et al*, 1999:23-24). It is in this context that present labour legislation is seen by critics to be 'a major threat to the economy' (Black and Rankin, 1998:452).

[25] The World Economic Forum's Global Competitiveness Report (1999, cited in Lewis, 2001:15) placed South Africa last with regards to flexibility, labour relations and labour force work ethic.

[26] This is because the use of unskilled labour has fallen due to the rising skill composition of the manufacturing labour force (Fedderke *et al*, 1999:23-24).

[27] The growth of wages for the different skill groups is significant in explaining the differences in their levels of employment. Unskilled and semi-skilled labour had the greatest growth in real remuneration; a 250 percent increase since 1970. Skilled labour had a growth of 110 percent while highly skilled workers had the smallest increase of 90 percent since 1970. It makes sense then that highly skilled labour in South Africa have faced negligible levels of unemployment for the entire period under study (1970–1998), but it is interesting to note that the unemployment rate for skilled labour has also begun to increase constantly since the mid-1980s (Lewis, 2001:14).

With increasing trade liberalisation, the costs of tradeable inputs (raw material and capital for example) are likely to come closer to equalised price. This means that competition will increasingly be around non-tradable inputs, such as labour, making the competitiveness of labour (wages divided by productivity) important as a determinant of the location of production[28] (Golub, 2000:15). It is important to compare South Africa with other developing countries as they are likely to be competing against each other in developed country markets and there is increasing trade between them (Golub, 2000:15). South Africa's unit labour costs (wage/productivity) in manufacturing in 1990 and 1998 were relatively high vis-à-vis other developing countries and close to or below those of the industrialised countries[29]. Labour productivity in a number of manufacturing industries is not high enough to support the wage, which means that either labour productivity must rise or labour costs must come down (Nordas, 1997:720). If South Africa is to be competitive, it cannot afford to increase real wages faster than productivity (Golub, 2000:17). This is a problem in the present system, which allows trade unions to bargain for wages only 'loosely tied' to productivity increases(Lewis, 2001:iii).

Another problem is the extension system which allows agreements reached by sectoral level bargaining councils, (who represent the majority of workers in that sector), to be extended to all parties. Larger firms, which dominate bargaining councils, are more capital intensive and are able to achieve higher labour productivity with higher wages than small firms. They can thus set a wage that smaller firms may be unable to meet. This may impact negatively on small and medium-sized firms and prevent them entering a sector (Moll, 1996:326-329). Indeed, firm level bargaining has been identified internationally as being a more efficient system (Black and Rankin, 1998:454, 461). Despite this however, little has been done to grant greater leniency to small businesses and the extension system has not been amended. This seems to suggest that the Labour Ministry supports a hard 'Higher Productivity Now' strategy. Such a strategy favors forcing firms up the value chain through a higher

[28] Other non-tradables such as infrastructure, physical and social capital, education and level of skills, will be captured indirectly in the competitiveness of labour by affecting labour productivity (Golub, 2000:15).
[29] Developing countries in the sample were all exporters of manufacturers (Edwards and Schoer, 2002:1017)

wage than that set by the market, regardless of the cost to employment (Nattrass, 2001:15).

A positive wage elasticity means that if relative wages of the unskilled are unnaturally high, firms are likely to substitute capital for labour (and skilled for unskilled) beyond the level required for an efficient allocation of resources. This will result in a labour-abundant country not being able to compete in labour intensive goods in which it should have a comparative advantage (Krueger, 1983:25). If however wages for unskilled and semi-skilled labour are moderated, competitiveness should increase and, as Lewis (2001:58) is able to show with a CGE model simulation, employment could grow twice as fast by 2008. Although some may complain about lower wages, South Africa has little or no welfare support for the unemployed, making a job essential for survival. This argument highlights the importance of keeping wages in line with productivity. This may require wage moderation in many industries if South Africa is to compete globally and if unemployment is to be reduced.

It would seem that flexibility and efficiency of the labour market must be improved if the rising unemployment is to be reversed (Edwards, 2001b:68; Lewis, 2001:vii). A first best policy would be to remove the inflexibility and allow wages to find their proper level. This however should be accompanied by training, infrastructure investment and increased information for labour (Fryer and Newham, 2000:27). Minor amendments to existing legislation proposed by the Department of Labour in July 2000 would have increased flexibility. Organised labour however was strongly opposed to the proposals (Lewis, 2001:33). This suggests that it will be hard to bring about the kind of flexible labour market needed in South Africa if unemployment is to be reduced.

For this reason, a wage subsidy may be needed to increase employment of unskilled labour. Lewis (2001:35) argues that subsidies would lower labour costs thus increasing employment, without negatively affecting productivity and competitiveness. Incomes of the newly employed would lead to extra demand for South African products. Subsidies would also be an effective policy against increasing capital intensity in South Africa, especially if the subsidy was financed by a tax on fixed capital assets. Lewis (2001:36-37) believes that capital would move

'from capital intensive sectors that provide few jobs to sectors in which a limited amount of investment generates large numbers of jobs.' He warns though, that subsidies are not a substitute for other job creating policies and although they would help with the unemployment problem, they would not solve it. Samson *et al* (2001:14) similarly argues for an employment subsidy and tax incentives that will 'rebalance' the skewed price of capital relative to labour and reduce the trend toward capital intensity. However rising capital intensity due to globalisation will be hard to change and unskilled labour is likely to continue facing declining demand. In fact, few industrialised economies have been able to maintain employment in manufacturing. If South Africa does not wish to or is unable to reassess its labour market policy, a third option may be to move into higher valued added sectors, which can accommodate the higher wage. This may be an inevitable option for South Africa which is a middle-income country. It might also be necessary for government to increasingly take on the task of reducing unemployment (Kaplinsky, 1995:190). Public works programmes to develop infrastructure may be one option. This will reduce unemployment and at the same time make the country more attractive to international investment.

3.9 International evidence of the impact of trade on labour

Before concluding, it is pertinent to look at some international examples of the impact of trade on employment so that comparisons can be made with South Africa. For both developed and developing countries, there have been significant shifts in the patterns of trade over the last twenty years (Morone, 1999:4). Developed countries have seen a shift towards increased use of skilled labour relative to unskilled labour and a fall in the level of employment in manufacturing. Desjonqueres et al (1999:533) argue that there is a global trend of demand shifting away from unskilled labour and this is the case for developed and developing countries alike. In their study they found that regardless of a countries change in wage differentials, all experienced an increased in the use of skilled labour in manufacturing.

To relate this to the thesis, the question is to what extent has trade contributed to the growing demand for labour. There is a general agreement that although trade has contributed to the rising unemployment of unskilled labour, its impact is relatively small in developed countries (Sen, 2003:5-6). Indeed many studies find that it is

small relative to other factors such as technology and demand. Desjonqueres et al (1999:533) argues that the major reason for the shift towards greater use of skilled labour is skill biased technological change. Below, evidence on shifts in individual countries will be considered. The focus of the evidence is on developing countries so comparisons can be made with South Africa.

Table 4: International studies of the impact of trade on labour

Country	Trade Effect on Employment	Studies	Notes & Qualifications
Italy	Negative	Bella & Quintieri, 2000	The effect of trade was small compared to factors such as technological change.
Mexico	Negative	Revenga, 1997 Hanson & Harrison, 1999	Unskilled previously protected. Rising inequality between skilled and unskilled
Morocco	Negative	Currie & Harrison, 1997	Many firms cut profits and raised productivity reducing labour
Brazil	Long Term Positive impact	Moreira & Najberg, 2000	Jobs are of a lower quality
Mauritius	Positive	Milner &Wright, 1998	Productivity gains
India	No negative impact	Khambhampati et al, 1997	Firms cut profits and increased profitibiltiy
China, India, Indonesia, Malaysia, Philippines, Taiwan	Positive	Ghose, 2000	Employment increased in both import and export competing sectors suggesting

Source: Own compilation and Sen (2003).

In countries where trade had a negative impact on labour, the effect of trade was found to be small or the sectors negatively affected by trade were uncompetitive. In Mexico's case, the negative impact on unskilled labour arose as unskilled labour intensive sectors, which were protected prior to trade, had to compete against low wage countries such as China (Hanson and Harrison, 1999:287). In Morocco, although sectors most affected by trade reforms experienced a fall in employment, the plant level study indicates that many firms, rather than reduce wages or employment,

cut profits and raised productivity to maintain competitiveness, (Currie and Harrison, 1997:S44).

In India, where there was no sizable impact of trade on employment following trade reforms in 1991, it was found that firms cut prices and increased output to maintain competitiveness (Khambhampati et al, 1997, cited in Sen, 2003:19). It could be that developing countries, which are determined to compete through price and wage cuts, will experience less of a negative impact of trade on labour, while other countries, such as Mexico, where unskilled labour intensive sectors were protected prior to trade, may not be efficient enough to compete in the global economy. This raises questions on the structure of the labour market with trade liberalization. This will be discussed in section 3.8 with reference to South Africa and other international examples.

Evidence for Brazil provided by Moreira and Najberg (2000:70) also find a negative impact on employment following trade reforms in the 1990's. This was only short term however, as over time trade caused a shift towards more labour intensive production. There has been a counter argument to this nevertheless, that these new jobs are of a lower quality (Amadeo and Pero, 2000:120). The argument that trade will initially have a negative impact on labour, after which it will become positive will be assessed in Section 3.5 for South Africa.

A study on trade and employment by Ghose (2000:293-294) found that for developing countries China, India, Indonesia, Malaysia, the Philippines and Taiwan, trade liberalization increased employment growth in both export orientated and import competing sectors (Results for the Philippines and Taiwan are not conclusive due to measurement problems). Ghose concludes that trade has a negative impact on employment in import-competing industries in industrialized countries, but employment is stimulated in both export orientated and import competing industries in developing countries. In general, from assessment of country studies, Sen (2003: 22) argues that trade seems to have had a positive impact on wages and employment in developing countries while the opposite is the case in the developed countries.

Although Sen (2003:24) argues that there seems to be much evidence supporting trade-induced technological progress and positive elasticity of labour demand in manufacturing sectors, the impact of these factors on labour seems to positive rather than negative. This is due to rising productivity and decreased market power of firms leading to increased labour demand[30]. This has been the case across sectors and not only in exporting sectors. The H-O theory would predict that labour would move from import competing sectors to exporting sectors, resulting in a rise in employment and wages in the exporting sector and a fall in import competing sectors. For Mauritius it is found that after trade liberalization in the 1980's employment and wages rose in both the exportable and importable sectors. The reason for the contradiction they put down to productivity gains in these sectors and a large increase of women into the labour market (Milner and Wright, 1998:524). From these examples it would seem that a large factor determining the effect that trade will have on labour in a country is whether the country has a flexible labour market and is able to raise productivity to be competitive in the global arena. A country that is unable to compete effectively will suffer

3.10 Conclusion

The purpose of this chapter was to get an insight into the unemployment problem in South Africa, the factors contributing to the problem and also the impact that trade might have had in this regard. It was shown that there has been a structural shift in production in South Africa, with the decline in primary sectors and a rise of manufacturing and service sectors. This has contributed to factor intensity shifts in the economy, with growing demand for capital and skilled labour and declining demand for unskilled labour. It is these trends which have been exacerbating unemployment. The underlying causes of changing factor intensities were examined. In particular, the degree to which trade has contributed to these trends as opposed to other factors such as technology, productivity, final demand and the labour market.

It was argued that technology and final demand played a greater role in impacting on employment than trade. However, it was suggested that, while technology had the greater role in causing a *rise* in the demand for skilled labour, trade had the larger role

[30] Such arguments are presented by Wood (1994, 1997) and Rodrik (1997)

in the *acceleration* of this demand. Due to defensive innovation (capital and skill upgrading to compete against imports), it is hard to separate the effects of technology from trade. Defensive innovation will be a change *within* a sector directly caused by trade and not technology, thus blurring the distinction of within and between sector changes.

Despite the smaller role played by trade, there is a general opinion that trade liberalisation has only benefited skilled workers. This is due to the increased use of skilled workers in exports and declining use of unskilled labour (Bell and Cattaneo, 1997:11; Bhorat, 2000:8; Lewis, 2001:46). Although there is also the argument that there has been an increase in unskilled labour demanded, it is agreed that even if this is so, the share is still low and the skilled and semi skilled have benefited far more than the unskilled workers (Edwards and Schoer, 2002:1040; Bhorat, 2000:8).

Another argument is that trade will impact negatively on employment in the short run due to efficiency gains, but in the long run, this should result in greater output and employment (Edwards, 2002:43). Researchers who did find evidence of a long term positive impact, such as Edwards (2001b:54) and Jenkins (2002:4), find the positive impact on labour to be small in South Africa. It is also the case that despite the improvement in South Africa's competitiveness in the 1990s, employment has continued to fall in manufacturing (Edward and Schoer, 2001a:30).

Even if the direct impact of trade on labour creation is found to be negligible, this is not a suggestion to limit trade. Firstly, it could be that the decline in employment was inevitable and trade may have ameliorated the decline (Roberts, 2000:628). Secondly, trade has many other benefits, such as increasing efficiency and technology assimilation, providing inputs into production, increasing market size and thus allowing for economies of scale. For these and other reasons, countries are liberalising trade and it would not seem prudent to return to a closed system.

Solutions to the unemployment problem included wage moderation, an employment subsidy and a movement to higher value added sectors. Wage moderation seems unlikely with trade union resistance. Subsidies could not continue indefinitely and even if they do reduce the apparently skewed incentive towards capital, factors such

as defensive innovation and market forces will continue to ensure substitution of labour for capital. The fact that high tech / skill and capital intensive sectors are those growing in world trade means that there will be increased incentive to move into these sectors and away from declining low technology, labour intensive ones. Few industrialised economies have been able to maintain employment in manufacturing (Kaplinsky, 1995:190), and it seems that South Africa is likely to follow this pattern and be forced up the skills ladder. This however, would only be possible with increased skill in the labour force.

The shortage of skilled labour means that government and the private sector will have to help to retrain workers in the new expanding sectors such as services. However, even with increased skill and a movement to more skill intensive industries, there are still likely to be large numbers of unemployed, as skilled industries by nature tend to use less labour than unskilled labour intensive ones. As Samson *et al* (2001:15) have highlighted, increasing labour intensive production is necessary to make any significant impact on unemployment reduction. For South Africa, it would be useful to develop and expand sectors which are both labour intensive and also growing globally and secure a competitiveness in such sectors.

Although it has been mentioned that wage moderation will be difficult in South Africa due to trade union resistance, international evidence shows that countries where trade impacted positively on employment was in cases where wages and profits were reduced to increase competitiveness. Such evidence should be considered carefully by trade unions in South Africa, as a more flexible labour market may assist in reducing the level of unemployment. If this is accompanied by a focus on developing value added, labour intensive sectors then there is no need for wages to fall too low as these sectors will have greater productivity levels which will be able to sustain acceptable wage levels.

CHAPTER 4
EMPIRICAL FINDINGS ON LABOUR USE

4.1 Introduction

This chapter undertakes a comparison of labour use between blocs and presents the findings derived from the factor content study that was undertaken. Section 6.2 provides an overview of the methodology used. Section 6.3 briefly discusses some shortcomings of factor content methodology. Section 6.4 uses the factor content method and Weighted Average Labour Coefficients (WALC) to compare how trade to the various blocs impacts on demand for different labour types. This is done for exports, imports and net trade. A note on the pattern of labour demand with individual blocs is presented in Section 6.5. Section 6.6 provides evidence to support the argument in Chapter one that South-South trade has greater linkages and may be more dynamic. Conclusions and general observations for certain blocs are made in Section 6.7 regarding the impact of trade on labour demand.

4.2 Methodology and Expectations

To reiterate, the purpose of this study is to analyse South Africa's factor content of trade and assess how trade to various blocs may affect demand for the various labour types. A factor content methodology will be used, similar to the approach used by Bell and Cattaneo (1997) in their assessment of changes in the volume and composition of South Africa's trade in the manufacturing sector. The factor content method is commonly used to test the H-O-V theory of trade but it has also been used, as it will be here, to estimate the impact of trade on factor demand (Wood, 1997:67). It is also the most widely used method to estimate the effects of trade on labour (Wood, 1995:64).

The approach attempts to calculate the factor content of trade by estimating how much of each factor is used in producing exports and how much would have been used to produce imports if they were manufactured internally. The difference between exports and imports is the impact of trade on the demand for the factor compared to what it would have been in the absence of trade (Wood, 1998:1470). In other words if exports use a larger quantity of a factor, for example labour, than imports, demand for

labour is increased by trade and vice versa. To explain this further, by exporting we are increasing output and, most likely, demand for labour. However, imports are considered to displace local output and labour. If we calculate the amount of labour in exports and subtract the amount of labour displaced by imports (i.e. the labour that would have been employed had we manufactured the goods ourselves), we are left with the factor content of labour in net trade. If it is positive, trade is likely to increase the demand for labour, assuming wages do not change, and if negative, then trade is not likely to increase labour demand.

In order to estimate the labour required to produce exports and imports of a sector domestically, Bell and Cattaneo (1997:5) use labour coefficients (employment / gross output) and multiply them by the export and import trade values of each sector respectively. Although labour coefficients may vary across activities within a sector, this method assumes that there is no systematic bias (Bell and Cattaneo, 1997:5). This is because, although some activities within a sector will have a higher coefficient than the average, others will be lower, so there is no reason to think that the estimates of total labour requirements or the weighted average labour coefficients will be biased in either direction (Bell and Cattaneo, 1997:5). This method will be employed in this study to assess how trade may affect labour demand.

Instead of calculating labour coefficients for each year, this study uses labour coefficients as calculated by Lewis (2001) for the year 2000 for all years (1990-2002). (Lewis's coefficients are used so that his indirect and Central General Equilibrium (CGE) coefficients can be utilised and comparisons can be made with results from using his direct coefficients.) Although labour coefficients do change from year to year, in Bell and Cattaneo's (1997:7) study the change in labour coefficients between years did not make a significant difference to employment. For example, in their study, between 1985 and 1993, the decline in the labour intensity of exports reduced the average annual rate of growth of employment from 3.67 percent to 3.10 percent. Bell and Cattaneo (ibid) argue that these differences are 'insignificant compared to the effect of variations in the rate of export expansion'. As changes in labour coefficients are only found to have a small impact on the demand for labour, this study does not calculate separate labour coefficients for each year and Lewis's labour coefficients for 2000 are used and applied to all years. This allows calculations to be performed using

Lewis's CGE and indirect coefficients for each labour group.

What is being measured in this study therefore is how the value of trade of various sectors has changed to different blocs over the period and how this has affected labour content in trade. This means that it is trade values alone and the shifts between sectors that are influencing the amount of each labour type demanded. Although this may be thought to be limiting, it will help to separate the effects of trade and technology on labour. It will give an insight into how trade is influencing labour (largely thought to be due to *between* sector shifts) rather than skill biased technical changes (which are largely represented by *within* sector shifts). This is because we are measuring labour demand based on changes in trade values *between* sectors. Labour coefficients *within* sectors do not change as coefficients from 2000 are used across the period.

The shortcoming of this is that trade may be influencing skill biased technical change through defensive upgrading and this will not be captured. Bell and Cattaneo (1997:7) argue that the decline in export labour coefficients, although not significant, did exacerbate the fall in manufacturing employment between 1985-1993. It can therefore be assumed that the findings of this study may have a slight downward bias, as labour coefficients for 1990-1999 are likely to have been higher in reality than the coefficient allocated to them from 2000. This is assuming that the labour coefficient continued to decline from 1993 to 1999.

Lewis (2001:81-83, 54) provides labour coefficients for professional, skilled, semi and unskilled labour, informal labour and total labour for various South African sectors calculated using input output analysis and the CGE model for South Africa (see Appendix 6 for coefficients). The highly skilled category includes professionals, technical, managerial and executive jobs, the skilled category includes clerical, sales, service, production foremen, supervisors, communications and transport workers, semi-skilled and unskilled categories include all the others (Lewis, 2001:11). Three types of coefficients are provided: direct, indirect and CGE effects. Direct labour coefficients indicate workers required in each sector to produce an additional R1 million of output. Indirect effects take into account use of inputs from other sectors required to produce an additional R1 million of output. Direct plus indirect

coefficients give the total labour coefficients. The ratios between total and direct coefficients provide the 'employment multipliers'. For example, the petroleum and petroleum products sector has a multiplier of 14.39, which means that when linkage effects are included, this sector creates nearly 14.39 times as many new jobs compared to direct effects alone. Consideration of indirect effects acknowledges that a focus on 'direct' labour only may lead to incorrect results regarding a sector's contribution to employment creation. For example, if output expands in the textile sector, total employment creation in textiles includes any rise in labour hired directly plus the 'indirect' increases in labour that occur in other sectors due to increased demand for inputs from these firms to the textile sector. The inclusion of linkage effects is important as it may provide a completely different perspective on sectoral labour impact (Lewis, 2001:81). Although a sector may appear to create little employment directly, if it has greater links to labour intensive industries it may ultimately create more jobs than an industry which has larger direct employment but few links. It is especially important to consider linkages in sectors where services previously undertaken in-house are contracted out. An example highlighting the importance of including indirect effects when estimating the impact on employment is demonstrated by Edwards (1999:13). He found that when linkages are included, net trade had a positive impact on labour between 1993-1997 but other research finds a negative impact when linkages are excluded (Edwards, 1999:13).

However, consideration of direct and indirect effects requires the assumption that resources are freely available at no cost to the economy, which is unrealistic when considering large effects (Lewis, 2001:82). In reality, when resources are limited, additional production in one sector means resources will be drawn away from other sectors, which will affect costs and production. For example, Lewis argues that professional labour is in short supply (while all other labour categories are in surplus), so increased demand for professional labour cannot be met without a loss to other sectors and without increasing wages. Sectors which use professional labour intensively 'carry a large opportunity cost to the rest of the economy,' with other sectors having to reduce output and hence employment, causing a net decline in labour demand in the economy (Lewis, 2001:84).

Lewis uses a CGE model to assess the impact on total and unskilled employment of a

R1 million increase in output in each sector. In the model, capital stock is assumed to be fixed so increased output can only be obtained at a higher cost via increased use of variable factors. Labour coefficients are derived, which include the impact on employment after taking into account a sector's use of scarce professional labour and capital. Lewis (2001:84) finds that over one third of sectors have an overall negative impact on labour due to their use of scarce professional labour and capital. This indicates the importance of considering the short-term costs to the rest of the economy of expanding output in sectors that use scarce resources intensively.

Following Bell and Cattaneo (1997) in the use of labour coefficients, this study will multiply Lewis's labour coefficients by South Africa's trade values to determine the proportion of each labour type in exports, imports and net trade to various trading blocs. This will be done for twelve sectors in each trading bloc for the period 1990-2002. This period incorporates the introduction of the General Export Incentive Scheme (GEIS) and its termination, the Uruguay Round trade liberalization agreement including tariff reductions, the trade agreements between South Africa and the EU, the Africa Growth and Opportunity Act (AGOA) with the US and discussions on the SADC free trade area (Abdi and Edwards, 2002; Alleyne and Subramanian, 2001:3; Lewis, 2001a)[31].

Trading partners to be considered are Eastern Europe, the European Union, the Far East, the Middle East, Northern America[32], South America and SADC (see Appendix 4 for a breakdown of regions). South Africa's largest trading partners are the EU, East Asia and Pacific, the USA and Sub-Saharan Africa (Alleyne and Subramanian, 2001:4). The inclusion of South America, the Middle East and Eastern Europe will provide further insight into the composition of trade with other developing countries. Assessments will be made on the labour content of trade to the various blocs, how this has changed over the period due to shifting trade volumes between sectors and the implications of this for labour demand.

To be able to make this comparison across blocs, the weighted average labour

[31] The GATT agreement became effective at the beginning of 1995 and South Africa joined SADC in 1994 (Strydom, 1995:557).
[32] The term Northern America is used as this bloc includes Mexico and the Caribbean Islands as well as the United States.

coefficients (WALC) for exports, imports and net trade will be derived as explained in section 6.4 below. Calculations will be made for direct effects for all labour types. Indirect and CGE effects are only applied to semi-skilled and unskilled labour and total labour as Lewis only provides CGE and indirect coefficients for these two labour groups. Data on South African trade values was obtained from the Industrial Development Corporation (IDC). These values are in constant Rands, which removes inflationary effects.

4.3 Criticism of the Factor Content Methodology

Before the findings are presented, this section will first review some shortcomings of the factor content approach. Among these is the assumption that imports compete with identical goods in the domestic economy and that they are perfect substitutes. It is assumed that imports 'displace' goods that could be manufactured at home. The problem is that much trade is in fact 'non-competing.' In other words, the South may not manufacture many skill intensive items imported from the North and the North may no longer produce many labour intensive items imported from the South. South Africa, in fact, imports many goods as intermediary inputs into the production process and so imports may even be complimentary to increased output and employment creation in some instances. The assumption made in this thesis is that all imports are competing. This shortcoming will mean that the results of factor content are likely to underestimate (overestimate) any positive (negative) impact that trade may have on labour demand.

The second proposed shortcoming is that the labour content of imports is calculated using domestic data from similar statistical categories. The approach assumes that imports within a foreign sector use factors in the same proportions to the domestic sector (Wood, 1995:64). As South Africa is a developing country, this implies that estimates of the unskilled labour content in imports from more developed countries are likely to be exaggerated while estimates for less developed countries are likely to be underestimated (Wood, 1997:9). An example of this is that the EU is likely to use relatively less unskilled labour to produce its cars than South Africa. The methodology assumes that if South Africa imports a car from the EU, this import will displace the same amount of unskilled labour used to produce a car in South Africa. As an imported car from the EU presumably uses less unskilled labour than in SA, the

unskilled labour content of imports from the EU is exaggerated. The opposite will hold with imports from SADC (a developing bloc) for example.

To alleviate this problem, Wood (1997:10) argues for the use of labour coefficients from the trading partner concerned, adjusted for wage and price. Hakura (cited in Alleyne and Subramanian, 2001:13) recommends that one also needs to look at the factor content needed to produce imported intermediate goods domestically. This would be helpful in South Africa's case, due to the large imported intermediary content in production. Such manipulations were not undertaken for this study however due to data limitations, so there is may be discrepancies in the findings. However, results will still be useful to get a general idea on how the direction of trade impacts on the demand for labour.

Another shortcoming is that the method is likely to underestimate the impact on unskilled labour due to trade because it does not take into account unskilled labour displaced by 'defensive innovation,' which arises due to import competition (Wood, 1998:1470). Competition from trade often results in local firms replacing their unskilled labour with skilled labour and capital, in an attempt to compete against imports. This will have a negative impact on unskilled labour which the factor content method does not take into account. Although it is generally accepted that the results of factor content analysis have a downward bias in that the method underestimates the impact of trade on labour, Wood (1998:1471) estimates that inclusion of defensive innovation would double the impact of trade on labour demand. This study does not measure defensive innovation and the extent to which trade with each bloc causes a substitution of skilled labour for unskilled labour, but obviously defensive innovation would work in favour of the more skilled and professional labour groups in South Africa and against the interest of semi / unskilled and informal labour groups.

This thesis looks at how the factor content of trade is changing to different blocs over time and links this to how trade with these blocs is influencing labour demand in the economy. The underlying causes of these changes is due to changing demand in trade for goods from different sectors intensive in varying labour types. It is important to assess why trade volumes are changing, which is difficult as there are many different

factors impacting on trade. Some of these are economic growth, changes in exchange rates, government trade policies, domestic expenditure, international investment, price movements and changing tastes. The reasons for the shift between sectors are complex and, to get a deeper understanding of how trade with any particular bloc is influencing labour, a more in depth study on the underlying influences of trade with that bloc would need to be made. This would make it easier to separate the impact that trade is having on labour demand from the many other factors that can be influencing it. Edwards (2002:4) argues that because of the difficulty of separating the different effects on employment trends in the 1990's, it is dangerous to infer what the impact of trade on labour is.

A major critic of factor content theory is Leamer (2000:19). Arguments using factor content methodology (such as that by Katz and Murphy, 1992) is that if the increase in US exports contained more skilled labour relative to unskilled labour compared to the increase in imports, then the demand for unskilled labour would be reduced[33]. Leamer (2000: 20) criticizes this approach, arguing that it is not necessarily the case that factor contents are linked to factor prices and he gives various examples of this. Key to assessing the impact of trade on internal labour demand is how the price of labour is affected by changes in global demand or supply conditions. This will determine whether there is a rise or fall in labour demand through trade. Measuring factor content is used as a proxy for changes in factor prices in the factor content methodology. If there is no link between the two, then there is a problem in using this methodology, and indeed, Leamer argues that '...it is only under special circumstances that factor contents can be accurate surrogates for the underlying price changes.' He thus he questions the use of factor content and suggests that one look at product prices directly (2000:25). Nevertheless, Deardorff (2000:89) still feels that factor content methodology is useful as long a care is exercised with regard to the questions it answers and the assumptions that are needed for the answers to remain informative.

Leamer (2000:19) also argues that one cannot use the capital to labour ratio in exports compared to imports to assess factor abundance and test the H-O-V theorem in a situation of unbalanced trade. This was the method used by Leontieff. Leamer has

[33] As Leamer (2000:19-20) notes, this is an approximation of the Stolper Samuelson approach.

shown that to determine factor abundance in this situation, the most appropriate test would be to compare the factor ratios in trade with those of consumption. If a country is a net importer of both capital and labour, as Alleyne and Subramanian (2001:3-23) show is the situation in South Africa, it will be capital-abundant if consumption is more capital intensive than net exports. As this thesis is not concerned with proving the H-O-V theory and is only concerned with the demand for labour, the factor content ratios are not compared with output.

4.4 Comparison of Labour Use between Blocs

The following section undertakes a comparison of labour proportions in trade between South Africa and various trading blocs. This is done using the Weighted Average Labour Coefficients (WALC) for each labour type (professional, skilled, semi-skilled and unskilled, informal and total labour) to the blocs concerned over the period 1990-2002. An example of the calculation of the Weighted Average Labour Coefficient is given for professional labour to the EU in 1990, but all labour types were calculated in a similar way for all blocs over the period 1990-2002:

- EU Trade Values of each sector in 1990 multiplied by Lewis Labour Coefficient for professional labour (Summed) = Total amount of professional labour in trade to the EU in 1990[34]
- Total amount of professional labour in trade to the EU in 1990 divided by the value of total trade to the EU in 1990 = Weighted average labour coefficient of professional labour to the EU in 1990.

In this example, the Weighted Average Labour Coefficient (WALC) is the amount of professional labour embodied in R1 million of trade to the EU in 1990. A Weighted Average Labour Coefficient of 1.05 in the skilled labour export category for the EU, for example, indicates that there are 1.05 units of skilled labour per R1m of exports to this bloc. This method allows us to compare trade across different blocs in terms of labour demand.

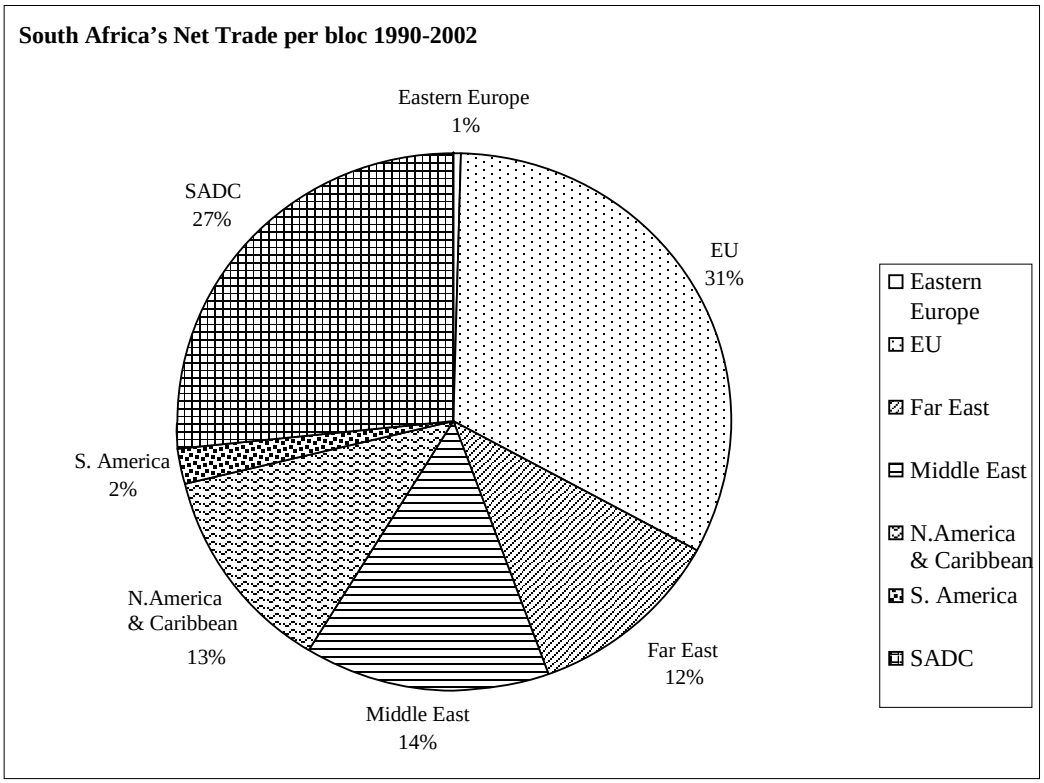
[34] Each sector has a different professional labour coefficient so the size of a sector will affect the amount of professional labour in trade to a bloc.

Direct, Indirect and Computable General Equilibrium (CGE) effects are calculated in this way, but for indirect and CGE effects this is only done for total and semi-skilled / unskilled labour categories according to the labour coefficients provided by Lewis. The purpose of calculating indirect effects is to see how the results change when linkages are taken into consideration. Indirect effects consider not only a sector's direct use of labour, but also its impact on labour in industries from which it is sourcing its inputs. CGE effects consider the opportunity cost of using scarce resources including professional labour and capital. The results of all three effects (direct, indirect and CGE) are presented in Appendix 7, Table 5 and 6, for exports and net trade respectively. Rank positions are presented in Table 8 and 9 in Appendix 7. Import positions are not reported in these tables as export and net trade positions are sufficient to assess labour demand. Graphs plotting the Weighted Average Labour Coefficients (WALC) are available in Appendix 3 which affords a more visual assessment of the trends in the WALC over the period (1990-2002).

Table 7 below shows the average WALC for exports, imports and net trade in the period 1990-1995 compared to 1996-2002. This is done in order to assess the change in the WALC of labour types with each region. This exercise will provide an insight into labour content and changing demand patterns in trade to various trading partners. As indicated earlier, any references as to the likely impact of such demand on employment are made with the assumption that real wages are constant.

To put the study into context, the chart below plots the average net trade in constant rands with each bloc over the period 1990-2002. As can be seen from chart 3, net trade is greatest with the EU and SADC. Smallest shares of trade are with South America and Eastern Europe so any effect these blocs would have on labour would be off a very small base. (Similar graphs for exports and imports were presented in Chapter 3).

Chart 3



Source: Own compilation based on trade data from the IDC (2003).

To begin the analysis, consideration will be given to the *average* WALC for each bloc over the period for exports and net trade (Table 5 and 6 in Appendix 7) and the *change* in the WALC for each bloc (Table 7 below). The assumptions made throughout are of competing imports and that wages are constant. The HOV theorem is referred to loosely for indications of what one might expect trade patterns to be. It should be remembered, however, that such references are not conclusive as trade in South Africa is unbalanced. Trade has not been compared to output which, according to Leamer (1980:498), is required in order to assess whether trade patterns conform to the HOV theorem in situations of unbalanced trade.

Firstly it is noted that Total Labour and Semi–skilled / unskilled labour follow the same pattern across blocs and so will be referred to simultaneously. The reason for the similarity is because semi-skilled / unskilled labour is the largest group making up Total labour. Informal labour also seems to follow the same trends as semi-skilled / unskilled labour.

Table 7 below shows the change in the average WALC from the first half to the second half of the period for net trade, exports and imports. A negative (positive) change, it means that there has been a fall (rise) in the labour type concerned in R1 million of net trade/ imports/ exports by the amount indicated.

Table 7: Change in Average WALC 1990-1995 compared to 1996-2002 (Direct Effects)

Net Trade: Direct Effects				Exports: Direct Effects				Imports: Direct Effects			
Total Labour	Ave. WALC 1990-'95	Ave WALC 1996-'02	Change	**Total Labour**	Ave. WALC 1990-'95	Ave WALC 1996-'02	Change	**Total Labour**	Ave. WALC 1990-'95	Ave WALC 1996-'02	Change
Eastern Europe	2.25	2.99	0.73	Eastern Europe	6.77	7.59	0.83	Eastern Europe	4.51	4.60	0.09
European Union	2.72	2.33	-0.39	European Union	6.80	6.52	-0.29	European Union	4.08	4.19	0.10
Far East	0.04	-0.16	-0.20	Far East	5.25	4.83	-0.42	Far East	5.22	4.99	-0.22
Middle East	-1.37	-1.71	-0.34	Middle East	5.30	5.25	-0.05	Middle East	6.67	6.97	0.30
Northern America	-0.90	0.46	1.36	Northern America	3.90	4.85	0.95	Northern America	4.80	4.40	-0.40
SADC	-5.58	-5.74	-0.16	SADC	3.99	4.18	0.20	SADC	9.57	9.92	0.35
South America	-0.77	-0.59	0.18	South America	3.55	4.22	0.68	South America	4.32	4.81	0.50
Semi / Unskilled Labour	Ave. WALC 1990-'95	Ave WALC 1996-'02	Change	**Semi / Unskilled Labour**	Ave. WALC 1990-'95	Ave WALC 1996-'02	Change	**Semi / Unskilled Labour**	Ave. WALC 1990-'95	Ave WALC 1996-'02	Change
Eastern Europe	2.16	2.96	0.81	Eastern Europe	5.10	5.99	0.89	Eastern Europe	2.94	3.03	0.08
European Union	2.85	2.41	-0.44	European Union	5.22	4.85	-0.37	European Union	2.37	2.44	0.07
Far East	0.49	0.25	-0.24	Far East	3.83	3.42	-0.41	Far East	3.35	3.17	-0.17
Middle East	-0.97	-1.46	-0.49	Middle East	3.92	3.82	-0.10	Middle East	4.88	5.28	0.40
Northern America	-0.52	0.70	1.22	Northern America	2.52	3.34	0.82	Northern America	3.04	2.65	-0.40
SADC	-5.33	-5.42	-0.09	SADC	2.52	2.73	0.21	SADC	7.85	8.15	0.30
South America	-0.79	-0.57	0.22	South America	2.20	2.81	0.61	South America	2.99	3.38	0.39

Skilled Labour	Ave. WALC	Ave WALC	Change	**Skilled Labour**	Ave. WALC	Ave WALC	Change	**Skilled Labour**	Ave. WALC	Ave WALC	Change
Eastern Europe	0.10	0.02	-0.08	Eastern Europe	1.11	1.04	-0.07	Eastern Europe	1.01	1.02	0.01
European Union	-0.05	-0.01	0.04	European Union	1.05	1.11	0.06	European Union	1.10	1.13	0.02
Far East	-0.25	-0.22	0.03	Far East	0.96	0.96	0.00	Far East	1.21	1.17	-0.03
Middle East	-0.24	-0.18	0.06	Middle East	0.92	0.95	0.03	Middle East	1.16	1.13	-0.03
Northern America	-0.22	-0.14	0.09	Northern America	0.91	0.99	0.08	Northern America	1.13	1.13	0.00
SADC	-0.15	-0.19	-0.04	SADC	0.96	0.95	-0.02	SADC	1.12	1.14	0.02
S. America	0.02	-0.01	-0.04	S. America	0.90	0.93	0.02	S. America	0.88	0.94	0.06
Professional Labour	Ave. WALC	Ave WALC	Change	**Professional Labour**	Ave. WALC	Ave WALC	Change	**Professional Labour**	Ave. WALC	Ave WALC	Change
Eastern Europe	-0.09	-0.11	-0.02	Eastern Europe	0.30	0.28	-0.02	Eastern Europe	0.39	0.39	0.00
European Union	-0.18	-0.15	0.03	European Union	0.28	0.31	0.03	European Union	0.46	0.47	0.01
Far East	-0.20	-0.19	0.01	Far East	0.27	0.28	0.01	Far East	0.47	0.47	-0.01
Middle East	-0.10	0.00	0.10	Middle East	0.27	0.29	0.02	Middle East	0.37	0.30	-0.08
Northern America	-0.12	-0.12	0.00	Northern America	0.33	0.34	0.01	Northern America	0.45	0.46	0.01
SADC	0.11	0.09	-0.02	SADC	0.36	0.36	-0.01	SADC	0.25	0.27	0.01
South America	0.03	0.02	-0.01	South America	0.32	0.33	0.02	South America	0.29	0.32	0.02
Informal Labour	Ave. WALC	Ave WALC	Change	**Informal Labour**	Ave. WALC	Ave WALC	Change	**Informal Labour**	Ave. WALC	Ave WALC	Change
Eastern Europe	0.09	0.11	0.03	Eastern Europe	0.25	0.28	0.03	Eastern Europe	0.17	0.17	0.00
European Union	0.10	0.09	-0.02	European Union	0.25	0.24	-0.01	European Union	0.15	0.15	0.00
Far East	0.00	0.00	-0.01	Far East	0.20	0.18	-0.02	Far East	0.19	0.18	-0.01
Middle East	-0.05	-0.07	-0.01	Middle East	0.20	0.20	0.00	Middle East	0.25	0.26	0.01
Northern America	-0.03	0.02	0.05	Northern America	0.14	0.18	0.04	Northern America	0.18	0.16	-0.02
SADC	-0.21	-0.22	-0.01	SADC	0.15	0.15	0.01	SADC	0.36	0.37	0.01
S. America	-0.03	-0.02	0.01	S. America	0.13	0.16	0.03	S. America	0.16	0.18	0.02

4.4.1 Total Labour, Semi-skilled / unskilled and Informal labour

What is immediately apparent from Table 6, Appendix 7, is that Eastern Europe and the EU are the only blocs with a positive WALC for Total labour in net trade, and this is only in the direct and indirect effects. Once the effects of scarce resources are taken into account (CGE effects) however, all blocs have a negative average WALC over the period. This indicates that trade is having a negative impact on labour demand in the economy once the use of scarce resources is considered. This is due to the opportunity cost that use of these resources has on production. It is thus important to overcome the problem of scarce resources in terms of either professional labour or capital for trade with the EU and Eastern Europe to be able to increase the demand for labour in the country. However, even without the problem of scarce resources, the average WALC of trade with all other blocs is negative (trade is not demanding labour and is in fact displacing it).

The outcome for semi / unskilled labour is slightly better. For this category, Eastern Europe and the EU maintain a positive WALC even in the CGE effects for net trade. All other blocs however are again negative (see Table 6, Appendix 7, for semi-skilled / unskilled labour). The reason for the high unskilled labour content in trade with Eastern Europe seems to lie in its positive net trade in Agriculture, Fishing and Forestry. Trade volumes with the Eastern Europe however, are still very small (evident in Chart 3) and this bloc is unlikely to do much to contribute to labour absorption through trade.

To obtain a more dynamic perspective, Table 7 has been constructed to show the changes in the WALC in period 1990-1995 compared to 1996-2002. From this analysis it is clear that Eastern Europe, Northern America and South America are the only blocs where demand for total, semi-skilled /unskilled and informal labour through trade has increased (see the shaded blocs in Table 7 for net trade which show a positive change in the WALC for net trade). The changes for South America are not as pronounced however. The positive change with these groups is due to exports to these blocs having increased their labour content. Imports from South America have also risen in labour content, but not as much as exports, resulting in the positive net trade effect.

A possible reason for the positive change with Northern America is the AGOA agreement entered into with the US in the second period. The increase with Eastern Europe and South America could be due to the more open trade regime agreed to in the Uruguay round of trade talks in 1994 and the democratic government elected in that year. After this date, there is a rise in net trade of Mining and Quarrying and Agriculture, Forestry and Fishing to Eastern Europe and Mining and quarrying and Basic Metals to South America, which would have increased the labour content of net trade to these blocs. As trade to these blocs is off a small base, the scope for increasing trade would be greater. Eastern Europe is also in close proximity to the EU with which South Africa has an FTA[35]. It is also the case that the EU incorporated ten new members on 1 May 2004, eight of which belong to the Eastern European bloc (EU, 2004:2). This will facilitate trade in the future with this bloc.

Due to the positive change in net trade in labour intensive sectors, it would seem that South Africa is increasing its competitiveness in exporting such goods to these two middle income blocs. As South Africa is also a middle income country, it would be difficult to predict the pattern of trade offhand by using the HOV model. Although one might like to argue that rising labour intensive exports bodes well for increasing labour demand through trade with these blocs as trade volumes grow, Eastern Europe and South America have the smallest net trade base with South Africa and trade patterns are often irregular. The impact on labour is thus likely to be small.

It should also be remembered that despite any positive changes, the CGE effects for total labour for all blocs at present are negative. Eastern Europe is the only bloc which has a positive average WALC as well as a positive change in the WALC over the period for semi-skilled / unskilled labour but trade volumes with this bloc are the smallest. It would seem therefore, that with South Africa's present trade pattern, the country cannot look to trade to increase labour demand in the economy. Attempts to increase competitiveness in more labour intensive value added exports may be one solution to addressing this problem.

[35] Bulgaria and Romania are set to join in 2007 (EU, 2004:2).

4.4.2 Skilled labour

SADC has the highest average WALC in net trade in the skilled labour category (indirect effects). Indeed, along with the Middle East, these are the only blocs which are positive (see shaded blocs for skilled labour in Table 6, Appendix 7). As SADC is expected to have the least skilled labour endowment of all the blocs considered relative to South Africa, the HOV trade theory would predict such a pattern. When consideration is given to how the demand for skilled labour in net trade has changed in the 2nd half of the period compared to the first half in Table 7, it is noticeable that changes are small for all blocs. Nevertheless, net trade to Northern America has the largest positive change. This is due to exports to this bloc growing in skilled labour content.

The AGOA agreement with the US may be contributing to this trend. Sectors with a relatively high skilled labour content (from Lewis's coefficients in Appendix 6), are Wood and furniture, Textiles and apparel, Paper and printing, Machinery and equipment and Mining and quarrying. For net trade with Northern America, Textiles and apparel became positive in 1993 and have continued an upward trend, especially since the AGOA became effective in 2000. This means that trade with this bloc is increasingly demanding unskilled labour, which is a positive trend for this labour group. According to Lewis (2001) unemployment is rising in the skilled labour category so increasing employment through trade for this group would be beneficial[36].

4.4.3 Professional Labour

For the professional labour category, SADC again has the highest average WALC in net trade (see Table 6, Appendix 7). The Middle East (indirect effects) and South America (direct effects) are the only other blocs that have a positive WALC's in this category. The indication is that South African exports to these blocs contain more professional labour than imports from them. As SADC has less professional labour than South Africa, it would be expected to import such goods and the result is in line

[36] To avoid confusion, the literature refers to a shortage of skilled labour or labour with skills in South Africa. In Lewis' labour categories labour with skills is subdivided into 'skilled' and professional labour so while there may not be a shortage of 'skilled' labour as he has categorized it, there is still a shortage of professional labour. When reference is made to labour groups as calculated in this thesis, it is according to Lewis' categories.

with what would be predicted by the H-O-V theorem. The results with South America and the Middle East, as they are also middle income countries, are less predictable. The findings provide some support for the theory that trade among developing countries will be in more technologically advanced goods (evidenced by trade which is positive in professional labour) and may be more dynamic. This will be discussed further in Section 6.6 below.

With regard to changes in the WALC for skilled and professional labour (Table 7), it is interesting that there has been a positive change in the net trade WALC to the EU, Far East, Middle East and Northern America[37]. This could be indicative of a global trend towards increased demand for more skilled and technologically advanced goods. If this is the case, then developing capacity in these sectors will be essential for long term competitiveness in South Africa.

4.5 A note on Individual blocs

Below some observations have been made for each bloc individually with regard to the findings. Some blocs are dealt with together due to the similarities in the results. As Eastern Europe as already been referred to above, no additional note is required.

4.5.1 Northern America

As evident in Table 6 (Appendix 7), Northern America holds middle of the range positions. This could be due to the composition of this bloc, which includes Mexico, a developing country, and developing Caribbean nations as well as the US. The WALC for semi-skilled and unskilled labour is positive in the direct effects which would be expected according to the HOV theorem, for trade to a developed bloc. Net trade for all labour types however have negative WALC's in the indirect and CGE effect.

Despite this, the WALC of exports to Northern America has risen in all labour categories from about 1993, the year the ANC called for the lifting of sanctions (Knight, 1993:1). This may account for the positive changes in all labour categories

[37] The change in the WALC for Professional labour to the Northern American bloc did not increased. The increase was only in skilled labour.

in net trade evident in Table 7[38]. Observation of figure 26 and 27 in Appendix 3 shows that the semi-skilled / unskilled labour WALC for Northern America becomes positive after 1996 with an upward sloping trend over the period. Figure 29 in Appendix 3 similarly shows that total labour has been positive after 1997. This is due to increased positive net trade in Textiles and apparel and Mining and quarrying.

The African Growth and Opportunity Act (AGOA) signed in May 2000, gives preference to labour intensive products such as Textiles and apparel, and is likely to have contributed to the rising trends from 2000 (US Dept. of Commerce, 2001). Prior to AGOA, apparel did not benefit under the GSP programme. AGOA has thus provided a major boost for this sector in terms of preferential market access (TRALAC, 2004:1). As it is important to increase demand for semi-skilled / unskilled labour, continuation of the AGOA agreement will be useful in assisting this process. This is especially so considering that the US is one of South Africa's largest trading partners, so a rise in the demand for labour through trade will have a greater likelihood of influencing employment (assuming constant wages). Although the trend is positive, it should be remembered that the average WALC for semi-skilled / unskilled labour is negative in the indirect and CGE effects, indicating that trade is not at present contributing to labour demand in the economy once linkages and the use or scarce resources are considered.

4.5.2 The Far East, Middle East and European Union: Total and semi skilled / unskilled labour

In exports, the Middle East, after South America has the lowest WALC on average for total labour and also has a low WALC in the semi skilled / unskilled category, indicating this bloc's poor demand for labour intensive exports from South Africa (see the CGE effects in Table 5, Appendix 7). The Far East is also relatively low with respect to its average WALC for total labour in exports. Following the extended H-O-V theory, countries which are abundant in unskilled labour tend to import skilled intensive products and export unskilled labour intensive products. As these blocs contain labour abundant countries such as China and India, this result may not be too surprising. The bilateral trade agreement between South Africa and India and China is

[38] Professional labour is the only category where the change has been neutral, rather than risen.

likely to further exacerbate the plight of unskilled labour, if these agreements are effective in increasing net trade (Whitehouse & Associates: 2000:4).

As well as the low overall average, changes to the WALC for the Far and Middle East have also not been positive in net trade (indicated in Table 7). These blocs, along with the EU, have all experienced a fall in their WALC for total labour and semi skilled / unskilled labour in the second period.

The Middle East has had the largest fall in the WALC in net trade in semi skilled / unskilled labour. Mining and Quarrying imports from this bloc have been rising rapidly since 1994 which could be the reason for this[39]. Although South African exports of Mining and quarrying have been rising rapidly to this bloc (and indeed are the highest export sector to this bloc from 1996, after Basic metals), they are dwarfed by imports, which began in 1994 with trade liberalisation. The Middle East has significant reserves of boron minerals, natural gas and phosphate rock as well as aluminum, cement, nitrogen and potash (Mobbs et al, 2001:321). A number of countries from this bloc are trying to diversify their dominant oil producing economies by growing their solid minerals sector (Coakley et al, 1995:2-3). This could explain increasing Mining and quarrying imports from this region. The result is negative net trade as shown in figure 16 in Appendix 2.

Another factor which helps explain the fall in semi-skilled / skilled labour in net trade to the Middle and Far East is a fall in net trade in the Textile and apparel sector and rising penetration in the Leather goods Footwear sector by the Far East (see Figure 6 in Appendix 1). The South African textile industry is battling to defend itself against relatively cheaper imports from China (which is included in the Far East bloc), and has requested that the government increase protection afforded to the local industry (Lourens, 2004:1). China has a massive production capacity, a strong fabric base and continues to improve technology. This has allowed it to expand its markets in the US and EU and it is becoming the most competitive, low cost producer in the world (Central Bank of Sri Lanka, 2002:101,104).

The fall in semi-unskilled labour in trade to the Far East and EU could also have been contributed to by fall in the Rubber, glass, plastic and non-metallic minerals sector, in which South Africa seems to be lacking competitiveness[40]. The trend with Northern America was also decreasing in this sector until 2000 when AGOA came into effect, which highlights the importance of this agreement.

The declining trend in labour content, especially for the EU, is not encouraging and does not bode well for future labour demand from trade with the EU. This is especially important considering the FTA that has been set up with this bloc and the fact that the EU is South Africa's largest trading partner. Sectors which have contributed to the high average WALC for the EU in exports are from the Machinery and equipment sector and the Textiles and apparel sector. The competition from countries like China in the Textiles sector in exporting to the EU could be the reason for this decline. South Africa still has positive net trade to the EU and Northern America in this sector, but the positive trade balance is not that large, possibly indicating that these blocs can source such goods more cheaply from other blocs.

In line with this is the argument by Wood (1997:51) that the comparative advantage of middle-income countries may have been altered with competition from lower income countries (notably China), as middle-income countries have a ratio of skilled to unskilled labour above the global average though below that of developed countries. The increase in the global supply of unskilled intensive goods has lowered their price relative to skill intensive goods, and from the mid 1980s onwards, middle-income countries have been less able to compete in these goods (Nattrass, 1998:19). In South Africa, this inability to compete has resulted in a move toward more intermediate skill intensive product lines, bringing about a fall in the demand for unskilled labour and rising skill intensity (Wood, 2000:7).

4.5.3 The Far East, Middle East and European Union: Skilled and Professional Labour

[40] Rubber products were amongst the worst performing sectors in terms of growth of competitiveness (as measured by relative unit labour cost[40]) in the periods 1990-94 and 1995-98. (Edwards and Golub, 2004:14).

Alongside the fall in the WALC for total and semi-skilled / unskilled labour, net trade with the Middle East, EU and the Far East have seen a rise in the WALC of skilled and professional labour. In Professional labour, the Middle East has experienced the largest positive change in the WALC for net trade (see professional labour in Table 7).

The rises in the skilled labour content in trade to the EU and the Far East has been contributed to by increasing net trade in Wood and Furniture and to Far and Middle East by Paper and Printing. Both these sectors have relatively high skilled labour content. These could perhaps be sectors where South Africa could increase efforts to carve a niche in the Far and Middle Eastern markets. The ITC (2000) has devised an index that measures the relative change of world market shares of sectors between countries[41]. This index shows that from 1996-2000, Wood products is among the top four sectors with the greatest growth. It is also evident that Wood products (excluding furniture), is especially valuable in contributing to reducing unemployment.

From Table 6, Appendix 7, it can be seen that the average net trade WALC for the Middle East, is negative for all labour groups in the direct effects and is only slightly positive in the skilled and professional labour category in the indirect effects. This indicates that this bloc is unlikely to contribute to labour demand and may even have a slight opportunity cost to labour in other sectors of the economy. Rising skilled and professional labour intensive sectors in exports to the Middle East does seem to be having an impact on the ability of exports to this group to benefit total labour as the WALC in the CGE effects was relatively very small on average (see the CGE effects for the Middle East in Table 5, Appendix 7).

It would seem that trade with these blocs (and the EU) is growing in skilled and professional labour and falling in unskilled labour. Such trends are not pleasing considering the need to increase employment in the semi skilled / unskilled labour category and the shortage of professional labour in South Africa. The EU, however, still has a positive net trade WALC on average over the period in the semi skilled /

[41] This index is considered as the sum of partner countries markets and products weighted by the share of these markets in world exports.

unskilled and informal labour categories (see Table 6, Appendix 7), indicating that trade would still be demanding such labour.

4.5.4 SADC

The SADC bloc has the highest average WALC in net trade in the professional labour category and also the skilled labour category (indirect effects). One would expect that as exports to SADC are high in professional labour content, there would be a large opportunity cost to labour due to the use of scarce resources. For this reason, it is expected that this bloc would be found to have a lower WALC in the CGE effects. This does not seem to be the case however, as SADC maintains its relatively high WALC (see rank positions in Table 9 in Appendix 7). The reason for this seems to be due to exports in the Machinery and equipment sector and the Textiles and apparel sector, which do not have a high opportunity cost in terms of professional labour (relative to most other sectors). CGE effects measure scarce resources, such as capital as well as professional labour, and while South Africa's exports to SADC may be professional labour intensive i.e. Machinery and equipment which is the largest export, they are not necessarily capital-intensive[42]. This alleviates the fear that exports to SADC, due to their professional labour intensity, will have a negative impact on labour when the opportunity cost to other sectors is considered.

The higher average WALC for SADC exports however has fallen slightly in the skilled and professional labour categories over the period. It fact, it shows a negative *change* in the WALC for all labour categories in net trade as evident in Table 7. These changes are not due to declining labour intensive exports. In fact exports to SADC have increased in total labour content and so have imports, but the increase in imports is greater resulting in a negative change in net trade. This means that net trade with SADC is demanding less of all types of labour. As SADC countries are less developed that South Africa and are expected to have a comparative advantage in unskilled labour intensive sectors, according to the H-O-V theorem South Africa's net trade with this bloc should be skilled, rather than unskilled, labour intensive. The change in the trade pattern for unskilled labour is thus moving in the direction of what would be predicted by neo-classical theory. This could be due to the SADC trade

[42] Bell and Cattaneo (1997:11) class machinery as labour intensive and not capital-intensive. Classification is done according to the capital / labour ratio.

protocol signed in 1996, which sets the conditions for the gradual reduction and elimination of tariffs (IGD, 1999:1). The rising skilled and professional labour content in imports from this bloc is harder to explain, although these rises are very small and may disappear if a longer time period is used.

It is still the case, however, that South Africa has positive net trade in most sectors which is indicative of the imbalance between South Africa and her SADC trading partners. These imbalances seem to be growing in most sectors with rising positive net trade for South Africa, (although imports from SADC are rising in most sectors too[43]). This is despite South Africa having offered to lower and remove its tariffs faster than other members of SADC, effectively allowing them faster access to South African markets that South Africa will get in return (IGD, 1999). The continued imbalance could be due to the fact that agreements relating to the offer have only been ratified by Mauritius. Barriers with Mauritius are now lower and South Africa has agreed to reduce barriers with other members as soon as they ratify agreements (IMCSA, 2004:4).

4.5.5 South America

On average (see Table 6, Appendix 7) this bloc has a negative WALC in most labour types in net trade, except professional and skilled labour, which are positive in the direct effects only. Trade with this bloc is thus not conducive to labour demand. This negative situation is improving however. In net trade, although both imports and exports have risen in labour content, the change in exports has been greater resulting in a positive change in net trade. Explaining this could be the fact that the two main sectors in net trade are Mining and Quarrying and Basic Metals, both of which have a rising trend in general over the period (see Figure 18 in Appendix 2).

4.6 Evidence for the South-South dynamic trade argument

As stated in Chapter 1, Amsden (1987:131) argues that skill intensive products have the largest economy-wide externalities, as output is usually the input for other sectors. As intra-South exports are said to be more skill and technology intensive than South-North exports, one would expect the developing blocs to move up in their positions

[43] Notably imports of Textiles and apparel, Food processing, Basic metals and Machinery and equipment have been rising over the period, along with and Wood and furniture, since 1999.

when the WALC for indirect labour (linkages to other sectors) is considered. For South Africa's exports to SADC, this is indeed what is found (see Table 9 in Appendix 7). SADC, which had the second lowest WALC in direct effects, now comes in third on average after Eastern Europe and the EU respectively. The reason for this does seem to be due to the nature of South Africa's exports with this bloc. Out of South Africa's top six export sectors to SADC over the period, five of them are sectors with the greatest employment multipliers[44]. It would seem therefore that trade with SADC, because of the stronger linkages of exports, leads to a greater demand for labour than cursory analysis would indicate.

Exports to South America and the Middle East (other developing blocs), do not seem to have the same linkages as exports to SADC (they do not gain positions in the indirect effects). This makes it hard to generalize that 'South-South' trade has greater linkages. As South America and the Middle East regions can be considered to be more developed than the SADC region, it may be expected that SADC would import relatively more technologically advanced goods per unit of trade from South Africa. This would result in linkages being relatively greater. Indeed, it may be the case that South Africa would import more technologically advanced goods from South America or the Middle East as they are also middle income countries and may have more capacity in these areas. In an examination of imports, South America is the only bloc to make gains in the indirect effects, which may again support the argument for greater linkages in South-South trade.

While exports to SADC have strong linkages, which are able to benefit total labour, these are overridden in net trade, and despite these linkages, imports are sufficiently labour displacing so that SADC has one of the highest negative WALC's for total labour (see Table 6, Appendix 7). It would seem that the greater labour demand created by linkages with this bloc is not significant enough to affect net trade. It should also be remembered that South-South trade is a two way process and if both trading partners have such linkages, the gain for labour in exports for one country will

[44] Sectors with the greatest employment multiplier coefficients are in descending order Petroleum, Food processing, Rubber, glass, plastic and non-metallic minerals, Chemicals and Basic metals (see Appendix 5). SADC's top export sectors on average over the period are Machinery and Equipment, Chemicals, Basic Metals, Food processing, Rubber, glass, plastic and non-metallic minerals and Petroleum in that order (own calculations based on the IDC data set of trade values).

be offset by the increased labour content in imports for the other (if imports are considered to be displacing labour). The benefits of 'South-South' trade may therefore lie in the long-term advantages of developing technological products where future demand is more likely to lie, rather than through greater linkage effects to labour. Skill and technology intensive products are growing in world demand and are thus likely to be the employment generators of the future (Lall, 2001:90).

Although this study does not attempt to measure 'dynamic' products and thus is unable to claim that South Africa's trade to SADC will be more beneficial to labour demand in the longer term compared to other blocs[45], it is able to show that South–South trade could be used as a possible launching ground for more advanced sectors such as Machinery and Equipment and Chemicals. South Africa has positive net trade in Chemicals to South America, SADC and the Middle East, where exports have been growing. The largest export sector to SADC is Machinery and Equipment and this sector has the highest number of dynamic products in world trade after the Motor Vehicle sector, with the highest average growth rates. The Chemicals sector is the second largest export sector and is also fairly dynamic in terms of world trade (Zalk, 2004:6). This provides preliminary evidence that trade with SADC is in dynamic products and such trade could be used to increase South Africa's capacity in these sectors.

4.7 Conclusion

The empirical analysis in this chapter was conducted to fulfill the purpose of the thesis, which is to examine the impact that trade with various blocs has on different labour groups in South Africa. To conclude and summarise some of the observations made, it is seen that trade does not seem to be contributing to labour demand in general (total labour), although there are some blocs where the negative trend is improving. These blocs include Northern America, Eastern Europe and South America. Trade volumes with the latter two blocs is currently very small and thus trade is unlikely to do much to impact on labour demand in the economy. Although the average WALC for Northern America for all labour groups is negative over the

[45] The study by Edward and Schoer (2002:1026), to identify which products were growing in world demand and then categorize them by blocs, had unsatisfactory results with products being very erratic (growing in one year and declining the next). As mentioned above however, perhaps a longer time frame may provide better results.

period, the WALC for semi-skilled / unskilled and total labour has become positive in the last few years of the period considered. This trend is a positive sign in light of the AGOA agreement.

The EU, which is South Africa's largest trading partner, along with Eastern Europe, has a positive WALC in the semi-skilled / unskilled labour category indicating that trade with these blocs will increase the demand for this labour group. For total labour however, trade with all blocs is negative in the CGE effects indicating that unless the problem of scarce resources and the shortage of professional labour are dealt with, no bloc considered in the study will contribute to labour demand in the country through trade. Alleviating these shortages could be achieved through greater foreign direct investment (in the case of capital), and relaxing immigration laws for people with scarce skills until local capacity is built up in this regard. Even if such problems are dealt with however, most blocs still would have a negative WALC and be unable to contribute to labour demand through trade.

Another disturbing trend is that the EU has a declining WALC in total and semi-skilled / unskilled labour and is showing slight increases in the WALC for skilled and professional labour. This is also the case with the Far East and the Middle East. Northern America also has a slight increase in its WALC for skilled labour. This may be indicating a global trend towards demand for more skill intensive products. The trend is particularly worrying with the EU and may indicate that trade with this bloc and others may contribute less in the demand for semi –skilled / unskilled labour in the economy in the future. The fall in the labour intensity of South Africa's exports to the EU could be due to increased competition from other countries such as China, which are competing with South Africa in the export of labour intensive goods to developed blocs. South Africa may be forced into the production of more skill intensive goods and will have to assist the workforce to acquire these skills through improved education policies and skills training. The Middle East has had the greatest positive change in professional net trade labour content and the largest decline in the semi-skilled / unskilled WALC. This does seem to be having an opportunity cost in terms of labour demand from this bloc through exports which is very small in the CGE effects.

An interesting finding is that trade with SADC is relatively professional and skilled labour intensive and does have greater linkages to labour (it gains positions in the CGE effects). The two largest export sectors to this bloc are also considered to be dynamic sectors growing in world trade. This lends some support to the theory that trade between developing countries is more dynamic and has greater linkages to other sectors. The impact on labour of exports is thus greater than cursory analysis would suggest. These findings do not hold for trade to other developing blocs however, such as South America and the Middle East, so one should avoid generalizations regarding South-South trade. It is also the case that these effects are not evident in net trade with SADC, suggesting that the effects on labour demand may be fairly weak

In the direct effects, there were only two blocs, the EU and Eastern Europe, with a positive demand for total labour. As already mentioned, when the opportunity cost of using scarce resources is taken into account, net trade with all blocs impacts negatively on total labour. With further analysis, it is found that for all labour groups (except informal labour, which hasn't changed) there has been a rise in the WALC on average for the period 1990-1996 compared to 1996-2001. This means that there has been a rise in each labour type embodied in R1 million of trade in the second half of the decade, compared to the first, which indicates that trade is becoming more favourable to all labour groups in South Africa, despite the fact that demand is negative at present.

CHAPTER 5

CONCLUSION AND POLICY IMPLICATIONS

This thesis began by suggesting that trade in different directions embodies different characteristics. In particular, it was claimed that South–South trade is more skill intensive than South–North trade (Lall, 1987:116; Amsden, 1980:4-5, 12). In Alleyne and Subramanian's study for South Africa, this claim was supported in terms of high and low income countries, that is, South Africa's trade to low income countries is more skill intensive than to high income countries. The significance of this arises from two hypotheses, which have implications for both development and labour demand. First is the argument that skill intensive products are growing in world trade and so will be more dynamic for future growth, and second is that skill intensive products have greater 'linkages' to other sectors and thus exports in these goods will increase output and labour demand further than would initially be expected (Lall, 2001:90; Amsden's; 1987:131): This means that South Africa's trade with other developing blocs should have greater linkages than trade to developed blocs, and this should impact positively on labour demand. This thesis was able to test the second hypothesis, with the use of weighted average labour coefficients, which take into account 'indirect effects'. However, the thesis did not test the first hypothesis, that trade to developing blocs is growing in world trade and that such trade may be more dynamic and beneficial to future economic growth. Nevertheless, cursory analysis can be made in this regard.

For the second hypothesis to hold, (that is, that skill intensive products have greater 'linkages' to other sectors and thus exports in these goods will further increase output and labour demand), developing blocs should be seen to move up in their weighted average labour coefficient positions in the indirect effects, compared to direct effects, and indeed, some support for this was found. South Africa's exports to the Southern African Development Community (SADC) move up positions for both semi / unskilled labour and for total labour, where the move is substantial. In imports, South America is the only bloc to make gains in the indirect effects. As these are both developing blocs, this lends some support to the argument that South-South trade has greater linkages, but as the effect is not found for all developing blocs, one cannot generalise and say that all South-South trade has greater linkages. Also while greater

linkages in exports to SADC impact positively on labour demand in South Africa, the greater linkages in imports from South America are detrimental to labour demand if one regards them as displacing labour, so the net effect of intra-South trade may impact positively on labour demand. In net trade, indirect effects do not affect overall positions to any significant extent, which seems to indicate that linkage effects are not significant enough to affect labour demand outcomes.

Nevertheless, the fact that there are greater linkage effects in exports with SADC suggests that trade may be more dynamic and technologically advanced. Another factor suggesting this is the finding that South Africa's trade to developing blocs, namely SADC, South America and the Middle East, does contain more highly skilled or professional labour per unit than trade with developed blocs. This supports the findings presented in Chapter one that South-South trade is more skill intensive.

Chapter 2 highlighted that South Africa's *dynamic* revealed comparative advantage showed the country to be competent in more value-added, high-technology sectors in general (Valentine and Krasnik, 1998:14). As these are products growing in world trade and are more dynamic from a long–run perspective, it would make sense to encourage the production of these products. It was argued that this could possibly be done through trade to developing countries, which has been shown to be relatively significant for exports of non-traditional manufactures (Black and Khan, 1998:12; Holden, 1998:464). This argument is confirmed in this thesis.

It was shown that net trade in more advanced sectors such as machinery and equipment and chemicals is greatest to developing blocs such as SADC, South America and the Middle East. It follows that by exporting to these blocs, capacity in these sectors will be encouraged. This will be beneficial to foster a competitive advantage in higher value added goods and will assist South Africa in moving towards closing the gap with the developed countries. It is also possible that these blocs could be used as stepping stones to exporting more of these products to developed blocs. It is likely that they will face less competition in developing markets which will give the industries a change to grow. The reasons that these products may be more competitive in other developing countries initially, rather than globally were given in chapter one, and include factors such as technologies which are more suited to each

others markets, cultural affinities and transport costs. Trade in this direction may thus facilitate future economic growth and labour demand. South Africa's trade talks with Mercosur and SADC on the formation of Free Trade Associations will go some way to facilitating the beneficial trade with these blocs (SACOB, 2004). In negotiations between blocs, emphasis should be placed on fostering higher technology industry through trade shows, buyer / seller investment information and incentives and cooperative agreements.

Although there is a suggestion that trade in more advanced products may lead to long-term labour creation due to higher growth in world trade, this study does not attempt to measure these effects (Edwards and Schoer, 2002:1024). This would be necessary to claim that South Africa's trade with developing blocs will be more beneficial to labour creation in the longer term i.e. if these are the products which will face rising demand in the future. This is another area for possible future research.

While it is important to encourage the development of technologically advanced goods through trade, the other side of the coin is that the move toward more skill intensive sectors and away from semi / unskilled labour intensive sectors is impacting negatively on labour. In this regard, Wood (1998:1477) argues that skill biased technical change is causing a rise in the demand for skilled labour and trade is responsible for the acceleration in this demand. This study shows that for South Africa, there has indeed been an increase in the use of skilled and professional labour in trade. Evidence of this is that the weighted average labour coefficient for skilled and professional labour in net trade shows a rising trend to the EU, Northern America[46], the Middle East and the Far East. It was argued in Chapter four that this may be indicative of a global trend towards increased demand for more skilled and technologically advanced goods. It seems inevitable that in a world making increasing use of computers and technologically advanced goods, that the trend will be towards greater demand for skilled labour and declining demand for unskilled labour (skill biased technical change). It is also palpable that if a country opens its markets to international trade, increased demand for skill intensive goods will indeed increase the pace at which skilled labour is demanded over unskilled labour. If this is

[46] Northern America shows a clear rising trend for skilled labour, but this is not so apparent in professional labour.

the case, then it would be expected that trade would impact negatively on unskilled labour in South Africa.

Past studies on the impact of trade on labour in South Africa give mixed results. Bhorat (1999:8) is one author who finds that the impact of trade on all skill levels in the economy as a whole to be positive. This study, which considers linkages and opportunity cost, finds that the impact of trade on total labour demand is only positive to Eastern Europe and the EU (directly and indirectly). When the use of scarce resources is considered in the Central General Equilibrium (CGE) effects however, it appears that net trade with all blocs has a negative impact on total labour demand. This justifies Lewis's (2001:84) concern for the negative impact on labour due to the opportunity cost of using scarce resources in South Africa. Even without the consideration of the use of scarce resources though, net trade with most blocs has a negative impact on labour.

Although the impact on total labour is found to be negative, when individual labour groups are considered, it is seen how each labour type has positive demand with at least one or two blocs. Demand for semi / unskilled and informal labour is positive with Eastern Europe and the EU. Although it may be expected that the 1999 trade agreement with the EU would increase the demand for labour, there is in fact a negative change in the WALC in the 1996-2002 period compared to the 1990-1995 period. At the same time there is a positive change in the WALC for skilled and professional labour. It was argued in Chapter four that this may indicate that the EU is demanding more skilled and professional labour intensive goods from South Africa and is sourcing labour intensive products from cheaper global sources. This does not bode well for labour demand for this group, especially since the EU is South Africa's largest trading partner.

A positive trend for labour, however, is found in trade with the Northern American bloc. Although the average WALC with Northern America is negative in net trade for all labour types, there was a positive change for all labour groups in the second half of the period considered, and the WALC for semi / unskilled labour and total has been positive on average after 1996 and 1997 respectively. This seems to be due to the lifting of sanctions in 1993 and the increases in trade since 2000 due to the AGOA. It

would seem that trade with Northern America is likely to grow increasingly favourable to labour as long as AGOA, or a similar preferential trading arrangement, is maintained.

Trade with Eastern Europe has the highest positive WALC for semi-skilled/ unskilled labour. The fact that eight countries from this bloc have recently become members of the EU[47] means that trade with these countries will have fewer restrictions and South Africa can gain greater access to these markets due to the FTA with the EU (The DTI, 2004: 1). This should foster trade beneficial to unskilled labour, however trade with this bloc however is off a very small base and currently is unlikely to make any significant impact on labour demand in South Africa. Further research into trade potential with this bloc would be useful.

The Far East and the Middle East are found to be among the blocs with the lowest WALC in total, semi-skilled / unskilled and informal labour. This is probably due to the composition of these blocs, which contains both developed newly industrialised countries (NICS) and large labour intensive countries such as India and China. To minimise the negative impact on labour demand with these blocs, it is important to find niche sectors in which to compete, such as paper and printing and wood and furniture (a labour intensive industry), which are shown to be on the rise in net trade to these blocs.. These are resource-based industries, which these countries may lack. There could also be co-operation in the development of technological products and joint ventures. Initiatives like the Tokyo International Conference on African Development (TICAD), held in October 1998, will hopefully bring about joint participation in trade and investment promotion and cooperation between South Africa and the Far East[48] (IMCSA, 2004:5).

The negative impact of trade on total labour found in the CGE effects would bolster arguments that trade impacts negatively on labour. Trade proponents may, nevertheless, argue that it is the rigid labour market in South Africa which is to blame.

[47] The ten new members are Poland, Czech Republic, Slovakia, Slovenia, Hungary, Latvia, Lithuania, Estonia, Cyprus, Malta (The DTI, 2004:2).
[48] The conference led to a number of activities designed to support African development being implemented in Japan and in Africa. This included the African Exhibition in Tokyo in 1999 and an African Investment seminar (IMCSA, 2004:5).

Indeed, the analysis of the impact of trade on labour for other developing countries in chapter two seems to indicate that the overall effect has been positive. Key to this seems to be the ability to cut wages and profits in order to compete effectively. A rigid labour market would seriously hamper efforts to compete in a global environment and may indeed be an important reason why trade has not had the positive impact on labour demand as expected for a developing country.

The above argument suggests that the present labour market structure, including extension agreements within industrial bargaining councils, should be revised so that labour regulations and wages are made more flexible. This, however, may not be so easy, as pointed out in Chapter three. Here it was argued that factors contributing to the unemployment problem included wages higher than productivity (related to the labour market) and the skills shortage. Solutions put forward were wage moderation, an employment subsidy or a movement to higher value added sectors. It was argued that wage moderation is unlikely with trade union resistance. Subsidies could not continue indefinitely and even if they did reduce the apparent skewed incentive towards capital, factors such as defensive innovation and growing global demand for more advanced goods may continue to ensure substitution of labour for capital. Finally, a move toward higher value added sectors would only be possible with increased skill in the labour force.

Increasing the skills of the labour force seems to be an imperative. South Africa is battling to compete in labour intensive goods against cheaper global suppliers such as China, and according to Wood (1997:51), the comparative advantage of middle income countries, like South Africa, has shifted to more skill intensive products. It seems that South Africa does not have a choice – to survive in a globalised environment it will have to move up the skills ladder, but the problem is the large unemployment among the unskilled. A simple solution would be to equip labour with the skills required to be of use in the growing sectors.

The Human Science Resource Council (HSRC) argues however, that the skills development process is complex and the needs of each industry must be considered. While some industries, such as finance, engineering and biotechnology may require postgraduate skills, other sectors such as forestry and tourism may have lower-end

skills. This suggests that rather than focus on increasing skills in general, a country should focus on developing skills in certain promising sectors. In the Quarterly Review of Education and Training in South Africa (Motala, 1997:1), it is noted that Government has taken important steps to improve education and skills training in South Africa, such as the 2005 Curriculum, gender equity proposals in education, the third draft of the White Paper on Higher Education, the Higher Education Bill and the Skills Development Bill. The Skills Development Levies Act stipulates that employers must pay1% of their workers pay to a skills development levy. The government has also initiated Sector Education and Training Authorities (SETA's) to formulate plans to upgrade skills in their sectors, promote learnerships and facilitate funding (SA Dept. of Labour, 2004:1).

According to the HSRC (2004:1) problems in developing skills and education persist. In education for example, they refer to the 'unacceptable drop out and repetition rates' and problems with the quality of education. The Quarterly Review (1997:1) states that there is a gap between policy and its implementation and this is due to a lack of human and financial capacity and differences of opinion on policy by various social groups. It would seem that more resources and capacity needs to be channeled into education and skills policies with clearly thought out plans for each industry as to what skills are likely to be required in the future and how to go about providing these. What is vital, however, is that the problems in basic education are addressed. A sound basic education will equip people with the fundamental skills to be flexible enough to adjust to changing global circumstances as they arise. Such flexibility is becoming increasingly important in a more liberalised global trading environment.

However, Lewis (2001) argues that even with increased skilled labour and a movement to more skill intensive industries, there is still likely to be large numbers of unemployed, as skilled industries by nature tend to use less labour than labour intensive ones. It is also the case that until new skills are acquired, unemployment among the unskilled is likely to continue (Nattrass, 2001:6-8; 1998:20). This does not seem to be an acceptable situation considering the current absence of suitable grants for the unemployed in South Africa.

It would seem that to make any significant impact on labour, labour intensive

production is necessary (Samson *et al*, 2001:15). The ideal solution would be for South Africa to try to develop competitiveness in more advanced goods which are at the same time labour intensive. This would allow South Africa to provide jobs and at the same time not be left behind in the technological race. An example of such a sector is Machinery and Equipment which is fairly labour intensive. At present in South Africa, this sector seems to be lagging behind the other blocs in trade. Despite South Africa increasing exports in this sector to all blocs, imports are growing at a more rapid pace, leading to an increasingly negative net trade balance (except to SADC where the trend is positive). It is nevertheless encouraging that after 2001, the growing negative trend to the developed blocs slowed down, indicating an improvement in performance. Contributing to this could be the fact that much effort was made to increase exports of machinery, electrical and transport equipment in 2001 (SARB, 2002:40). Due to the labour intensive nature of this industry, such efforts should be continued.

It is also worth noting that even if South Africa does have to move up the skills ladder, Nattrass (2001:16) has made the argument that low productivity and high productivity industries can exist side by side and a country does not have to choose one form of production over another. These industries serve different functions and benefit different labour groups in the economy. This thesis has shown how demand for labour types and goods varies in trade between blocs. This can be used as part of a targeted trade policy, marketing drives or trade agreements and negotiations to benefit these different industries and labour types. The information should be used alongside a good overall trade policy to the benefit of all labour types and dynamic future growth in South Africa.

There is some evidence that the promotion of trade with developing blocs may foster the production of more advanced goods (proxied by professional labour intensive trade) and that exports to SADC have greater linkages which benefits labour. Nevertheless, such trade should not be seen as a substitute for trade to the North. While greater skill intensive trade may be beneficial to long run growth (if these products are growing in world trade), trade to developed countries, due to their large size, would be better for providing employment and growth in volume of output. The benefits found in trade to both developed and developing blocs would support the

argument that trade in any one direction should not be chosen over another.

It has also been shown that the advantages of trade with each bloc can be maximised by recognising how each bloc can be used to foster the dynamic development of any particular labour type. The EU could to be used to further develop the market for traditional products like mining and quarrying and the US for textiles and apparel. Trade with the Far East and Middle East would be beneficial to paper and printing. Furthermore, exports of wood and furniture to the Far East would be a way to regain some of the labour intensive industry we are losing to them in other areas such as textiles and apparel and leather goods and footwear.

Lewis argues, regardless of preferential trading agreements (which will influence the direction of trade), of more fundamental importance is the need to improve incentives to export in general and 'create a more level playing field for all' (Lewis, 2002:v). Although the findings of this thesis support this statement and agree with authors[49] who argue that trade diversion should be avoided, it is nevertheless found that trade does differ by direction. For each labour type there are certain blocs where labour demand is positive. This is also the case for net trade for particular sectors. Such information could be used as part of a targeted trade policy to assist in the marketing of particular sectors in trade and also for increasing labour demand for certain labour groups. Trade with SADC, for example, may be useful to assist South Africa to develop more advanced sectors which are necessary to close the gap between the North and the South. In this regard, the direction of trade can possibly be used as part of an overall development strategy. Its ability to affect labour demand through linkages seems to be limited however. The advantages of South-South trade may lie in the dynamic benefits that trade in higher technology goods provides and further research in this unexplored area will be useful.

[49] (Lall, 1987; Cizeljc and Fuks, 1987; Havrylysham and Wolf, 1987; and Havrylysham, 1987),

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Data for Figures 1- 12 - (Appendix 1)

Figure 1 – Net Trade Agriculture, Forestry and Fishing

Year	Eastern Europe	EU	Far East	Middle East	Northern America	S. America	SADC
1990	5528420	1451883512	477056322	148275893	-211817436	-27358225	-75445202
1991	-3729128	1551607451	191603644	41412051	-144427418	-90325448	-145284575
1992	-23987192	1580368434	69415907	69797438	-773423492	-76997358	-89912858
1993	1324800	1667374406	65033694	114028282	-214672724	-112701240	-317382607
1994	4661616	1745366610	636668255	335598139	-719933223	-145900138	-209283320
1995	9697799	1912883347	189654884	95955858	-615199593	-187337612	-77543367
1996	45738883	2080767848	795787210	271532986	-233582638	-54188184	-4255773
1997	83887933	3167160793	144308997	363400983	-243201260	2352191	-334189850
1998	96407857	3153539049	182287811	171339326	-156062034	-195657793	350168377
1999	234477838	4071307674	337876019	751471036	-232804893	-306251491	190841690
2000	65399019	3697118860	546678362	281032241	176309083	-465351621	-332090394
2001	-90120328	3867839475	666909173	250532711	-412148975	-788211181	-239407900
2002	88336400	5232313203	444454171	364514440	-322556873	-749839046	1070451759

Figure 2 – Net Trade Machinery and Equipment

Year	Eastern Europe	EU	Far East	Middle East	Northern America	S. America	SADC
1990	-18876456	-1.0477E+10	-4683700710	-236596083	-2485683170	-28985182	844098377
1991	-25553960	-9958187760	-5650033706	-293285901	-3573983911	-122371671	1169370611
1992	-57086694	-1.1162E+10	-8415749402	-420146979	-4033404270	-164795184	1357627941
1993	-31979656	-1.7936E+10	-9748165212	-468598737	-5043554658	-100764139	1615320717
1994	-75271607	-2.261E+10	-1.2297E+10	-951021857	-6191307723	-164714682	1956849046
1995	-139431849	-2.6207E+10	-1.3289E+10	-1333604465	-7848552320	-261488798	2988128833
1996	-102561777	-2.7231E+10	-1.3862E+10	-1249849654	-9038416256	-603740707	4212886630
1997	-151509122	-3.3976E+10	-1.5514E+10	-1400089588	-10727192601	-279825430	4314718081
1998	-178088633	-2.8352E+10	-1.6642E+10	-939758068	-10973051140	-266369907	4394792907
1999	-543249195	-3.1482E+10	-2.2098E+10	-1784749662	-12107238157	-802077804	4428762339
2000	-525767365	-3.8271E+10	-2.2103E+10	-429532986	-13334452470	-1514411164	5248159061
2001	-1094427407	-4.8165E+10	-2.7554E+10	-618634091	-14508269232	-1723347625	6473423974
2002	-982894005	-4.4906E+10	-2.6132E+10	-864055080	-12281130468	-2265509640	8524376560

Figure 3 – Net Trade Basic Metals

Year	Eastern Europe	EU	Far East	Middle East	Northern America	S. America	SADC
1990	14320812	1193345908	2484006602	910104126	631268186	162855805	645101009
1991	47607222	1167841622	3101443469	968510606	497889970	267294503	728905760
1992	25977462	592693644	2938640685	1002716712	860816421	262061906	731354317
1993	-23202207	118889899	2906602870	948073645	975543516	199057403	706508186
1994	-91031862	-350150499	3389269400	906714775	1621253941	214236154	785233144
1995	-32560304	397063850	4016209345	1331831729	1258837657	233426213	1659677402
1996	-87843440	483511588	6824383630	1976992859	1727634048	175549999	1442647198
1997	-119364558	377321440	8095079738	1298697519	1739863532	256031618	1550236956
1998	-137744003	3621966593	5182750732	1530496736	3187286154	296137879	1438336478
1999	-408468456	2310578063	7465472205	1588747222	3137576236	195809701	1814078183
2000	-110382185	4017351124	9029852309	1516021861	4899401611	449842062	2514961573
2001	-95654095	3361170877	7358320657	2229978192	3580568187	448118710	2033456315
2002	-9333552	4270579513	1.3442E+10	2007118657	4635358900	492772118	3055838380

Figure 4 – Net Trade Chemicals

Year	Eastern Europe	EU	Far East	Middle East	Northern America	S. America	SADC
1990	-31309830	-2942134153	-69804894	-23395294	-801876701	-58041182	679300134
1991	-40675847	-3286775403	-73064891	-59239860	-840099743	-25249068	809803459
1992	-48503184	-4121197555	-233665623	-68941874	-560881454	-7189939	873545643
1993	-101674432	-5277774813	-410571682	-123750908	-850655109	-78113309	1010519732
1994	-59438209	-6264133524	-572847435	-48023450	-988807773	-120369392	1291998230
1995	-55112985	-6850246244	-320734369	-20922049	-979135477	-30549931	1461596758
1996	-98888058	-7128479668	-347879744	-5492760	-737946941	84791661	2086219837
1997	-105708175	-7747678886	-645213987	44830347	-1159444207	203860538	2307483631
1998	-155655037	-8801023031	-785207205	172551817	-1365653267	238064617	2359403620
1999	-223174188	-9853917272	-1170069587	-201428147	-2078968009	38879725	2610556080
2000	-344418749	-1.0797E+10	-1445824178	-19636771	-1800763114	201046724	3759811977
2001	-513861354	-1.3887E+10	-2111555256	-444001335	-2621144391	84672225	3566464714
2002	-440899025	-1.2646E+10	-2024526669	-80370628	-895689684	136809302	4698796271

Figure 5 – Net Trade Food Processing

Year	Eastern Europe	EU	Far East	Middle East	Northern America	S. America	SADC
1990	6468972	462370511	375144349	209643799	-151490926	-345122137	342182377
1991	-1661202	639765315	293859679	167314262	-168369952	-212920806	538036936
1992	-35418147	466477152	-122810936	42348352	-150078230	-181644329	534621797
1993	-21478470	204305615	-294736659	28010182	-236762629	-676052187	648528468
1994	50324493	14775060	-226727285	79293858	-245958618	-527826343	744386964
1995	-9793725	48317218	-96887736	-1653037	-460463970	-847330096	1024410739
1996	63002542	296940383	-8750918	50860931	-247658506	-937924557	1421126500
1997	-33444823	82128871	-435199175	195434171	-336276897	-648628285	1467605373
1998	69391332	355448863	273527443	260332535	-167474620	-842724139	1695161815
1999	59701946	240120081	-6244626	584927668	-246930787	-1062832205	1847916665
2000	-54590533	1166982715	57625058	689311970	171706790	-1594264645	2091098387
2001	49351303	1759365559	635858398	569610622	-23549013	-1835615462	2385892765
2002	17977002	2777689680	507810128	402190976	355617822	-1869323894	3602915460

Figure 6 – Net Trade Leather goods and Footwear

Year	Eastern Europe	EU	Far East	Middle East	Northern America	S. America	SADC
1990	-280702	-42777335	-127758343	-49550911	-6822792	-13251507	-17767260
1991	-441246	1805078	-217136507	-51652520	-6919062	-13508167	-18905301
1992	-746489	34376981	-324409548	-63996409	263242	-21058972	-35268809
1993	753381	-10542735	-357513294	-120627710	37684142	-40889055	-42929795
1994	6000935	95263646	-479652340	-146973051	55781683	-34799228	-51007075
1995	-1479379	46949204	-554976583	-144518179	30786372	-52364555	-19211510
1996	-1082015	61182187	-569405003	-182445759	13775825	-63615365	25411432
1997	-20724106	23011734	-534860375	-191839688	33876933	-58027116	16781689
1998	-15532752	167958469	-731917054	-195399119	-1300844	-71087556	9647369
1999	-2323317	96931811	-599144974	-143281312	40124306	-108399613	17211709
2000	-2721195	417162403	-937165392	-172017285	59392953	-89388412	14224810
2001	-5946909	349486437	-1336689781	-15081793	209695408	-17699176	28144742
2002	-5446427	17960837	-1599356641	-41240250	14384631	-36790485	38092634

Figure 7 – Net Trade Paper and Printing

Year	Eastern Europe	EU	Far East	Middle East	Northern America	S. America	SADC
1990	-5912245	-306173574	374735559	148837204	-249866901	58374425	140167698
1991	-4566762	-241593424	279412780	128965368	-348705370	50555458	200380150
1992	-12431391	-587430991	415944250	107186489	-322180238	97692280	177637404
1993	-10589337	-1093480862	415620458	105575327	-422257284	75086509	230935439
1994	-26092056	-1347005338	513754216	93222538	-507149869	43797085	499674113
1995	-25424758	-1304024798	987988147	181795602	-970810207	110324530	371314638
1996	-10694254	-1595774112	832103278	203037769	-776581294	75492200	692767087
1997	-17917600	-1835571699	693567955	173663863	-859038362	48587134	498537598
1998	-14957126	-1551728880	727874959	179206138	-812556330	159918175	558020210
1999	-10105204	-1673900588	831981637	268921581	-817522282	28402431	624586365
2000	-43415145	-1139691420	1463199567	477446906	-719672516	191419226	834781274
2001	-59905339	-837125762	1059392280	414821063	-878324564	237781979	877352036
2002	-47995112	-771647115	972145284	447502924	-895725698	14378688	936972562

Figure 8 – Net Trade Petroleum

Year	Eastern Europe	EU	Far East	Middle East	Northern America	S. America	SADC
1990	-2023	24136973	-39532236	-264049	-48544118	-785349	18347278
1991	-26	-39602847	-32068830	-2850088	-44987324	3543294	25895206
1992	-227822	96895419	-49070956	-2016156	161177674	10357669	20146144
1993	-37451	85052250	-28386069	106563	70096247	25653070	22248578
1994	-50422	-145682799	-37195390	-1175923	-135528349	24696815	43609598
1995	-411625	-202388738	-77015544	-165041266	-239862692	116003680	1579518241
1996	7901930	363908711	-46153375	318237310	-155638794	34887801	1657813409
1997	7785311	-145643520	-33740591	53728396	-31472784	-15455270	1659000349
1998	8401	-166491926	-211158353	-246186480	-573296681	-21279625	1022650676
1999	-76079	-293762090	-187837245	122680495	-270576292	16936262	1190880394
2000	-1810026	81021298	-264469242	204059366	-482297554	14169320	912726032
2001	-310112	-76137430	-272984688	56359142	-652892606	13548667	300280363
2002	500760	11342814	-244446634	76589435	-646841520	16577009	158310511

Figure 9 – Net Trade Rubber, Glass, Plastic and Non-metalic minerals

Year	Eastern Europe	EU	Far East	Middle East	Northern America	S. America	SADC
1990	-4483583	-879976750	-272733995	-26753199	-122084523	-37415306	157617349
1991	-8641317	-882931121	-332009584	-22881986	-137528213	-37227585	222919586
1992	-19937341	-989663553	-469873592	-49871492	-168928153	-23969830	234184058
1993	-26704367	-1250005225	-591600956	-30993309	-191269016	-22344462	298394100
1994	-29698147	-1608819138	-775044957	-73765761	-290147298	-45679482	345786084
1995	-25412542	-1895254275	-829956398	-113011774	-371139377	-38978381	426847474
1996	-20873454	-1953391647	-1029467199	-117013001	-341341090	-39553946	636301680
1997	-31352605	-2285038699	-1219255198	-206558274	-396863947	-24060802	764772208
1998	-10523519	-2293831056	-1481801663	-141812182	-504055953	-19946222	837864542
1999	-34384124	-2489521652	-1743674118	-200377746	-710351552	-58115878	878336780
2000	-40805492	-2561114202	-1965039964	-171856872	-775364096	-116425280	1112241053
2001	-64336058	-3280588751	-2685675565	-237737927	-733629766	-247191491	1296219631
2002	-27671653	-2531449390	-2644006774	-158505170	-647547415	-242438049	1631785937

Figure 10 – Net Trade Textiles and Apparel

Year	Eastern Europe	EU	Far East	Middle East	Northern America	S. America	SADC
1990	-1730134	-75123246	-573549467	-107090881	-30990036	-11354039	106065468
1991	-7117763	-18772966	-753025903	-125123745	-46751182	-1940536	177586306
1992	67852192	64815521	-744380872	-180603327	-32973034	279027	103197378
1993	14802329	-12758446	-940213067	-279838450	6696803	2927210	7043322
1994	-9618240	-244222675	-1062065559	-360503938	52635700	2449533	104993135
1995	-1526276	-171327168	-1220005472	-400287460	41368817	15811640	7889406
1996	3600124	-88889616	-1421524892	-448602508	103582208	15591549	101330547
1997	-5456088	-89231083	-1570626262	-500908221	179837768	22234975	159337008
1998	-344327	43233794	-1962389755	-423008813	212048386	12197231	-138949013
1999	-11746431	-26034310	-2492216935	-639293883	388618154	1363444	400617381
2000	-30882245	32285255	-2556614866	-586818606	1124876315	20488438	209446533
2001	-25482168	-124818735	-3126042653	-648959916	1235135541	30420055	158257258
2002	-13028212	389614350	-3025468285	-652427233	1745015661	15342090	307190461

Figure 11 – Net Trade Wood and Furniture

Year	Eastern Europe	EU	Far East	Middle East	Northern America	S. America	SADC
1990	-5442746	136440757	-49099589	-62694635	-54597612	-21039316	1865811
1991	-2484004	150716520	-81419759	-55379703	-77452445	-24665658	17674625
1992	-1226791	139639351	-154438751	-56032361	-113491258	-18388017	-9373575
1993	-2060953	120859658	-48424343	-58445100	-114921699	-27213237	2225123
1994	-3717592	498725885	172221213	-73099274	-51616699	-34828755	11115910
1995	-4949290	974876571	297493975	-43665743	-114779410	-26662136	-9184319
1996	-2447756	1259561537	232629953	-37407369	-132254617	-53373181	-14109781
1997	-4881939	1417849645	332493192	17286144	-114101532	-60212215	64922111
1998	-12399974	1696670425	563456515	4161279	-114261043	-61120571	97639159
1999	-5781152	1918011848	542289201	3808627	-144594057	-63695169	66092323
2000	-44032169	1914279706	660451388	4401186	27280147	-47497824	107169670
2001	-106630584	1997454064	951832131	-15139793	-113861166	-41317575	132146665
2002	-101876378	3432537768	1508329920	3829564	108304909	-45737698	208222198

Figure 12 – Net Trade Mining and Quarrying

Year	Eastern Europe	EU	Far East	Middle East	Northern America	S. America	SADC
1990	100735655	3700203718	2568220887	436094900	111176227	67283229	22511889
1991	155795365	3934438429	2503545866	496312313	124847665	50420949	35326800
1992	145651193	3656379140	2463684074	451149750	54881741	71402423	-46459707
1993	159897138	3562328161	2839887389	1240276895	341048381	116392329	-199101674
1994	172757115	5450284573	2679510104	-5453381300	150160335	140301342	-324513916
1995	259201642	8279053458	3446845654	-7009629064	45974899	251835783	-698304767
1996	144496192	1.229E+10	3706014353	-1.0213E+10	45063177	277084473	-275640735
1997	259392542	1.4529E+10	4510644254	-6311845166	823604210	-362010613	391580058
1998	247345401	9992751739	4070325083	-9840530798	2770886331	404979005	146182776
1999	299595562	1.1603E+10	4401172011	-2.0201E+10	1718447510	248722016	373540063
2000	297085705	3.0102E+10	1.1693E+10	-2.0092E+10	11184893292	307646653	305051577
2001	-474188200	1.945E+10	7114419668	-1.8135E+10	5856710950	466814482	-150309465
2002	-548552282	2.4258E+10	5939878099	-1.6401E+10	2329672682	394473850	-194191304

Figures for Grahphs 13 - 19: Appendix 2

Graph 13 – Eastern Europe Sector Net Trade

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Agri, F,F	5,528,420	-3,729,128	-14,732,648	-25,512,888	8,285,011	15,077,201	40,728,465	111,395,059	67,944,751	234,354,235	87,122,040	168,480,165	88,336,400
Mine&Qq	100,735,655	155,795,365	129,780,320	158,337,117	172,938,879	259,098,118	297,731,173	199,121,155	188,269,096	299,802,340	272,434,927	233,763,199	-548,552,282
Food Proc.	6,468,972	-1,661,202	-41,697,889	-21,567,136	41,369,382	-7,728,393	76,286,696	-27,065,605	51,555,080	83,842,366	-27,540,178	26,364,801	17,977,002
Tex&App	-1,730,134	-7,117,763	68,716,565	19,489,841	-6,130,329	-10,500,261	1,769,786	1,758,643	-1,724,640	-4,499,565	-8,818,379	-30,472,109	-13,028,212
Leather&F	-280,702	-441,246	-398,835	191,319	6,528,397	-1,188,593	976,730	-3,622,448	-20,743,263	-15,826,978	-1,830,881	-2,898,831	-5,446,427
Wood&Furn	-5,442,746	-2,484,004	-2,419,684	-1,423,638	-940,534	-4,409,123	-3,443,401	-3,899,442	-4,069,385	-2,160,373	-9,391,150	-45,018,916	-101,876,378
Paper &P	-5,912,245	-4,566,762	-6,365,300	-12,016,893	-9,937,429	-27,021,225	-19,463,830	-11,631,593	-18,633,139	-1,964,140	-22,334,934	-36,348,829	-47,995,112
Petroleum	-2,023	-26	-	-227,822	-37,451	-48,764	7,897,227	8,455,969	-6,938	-805,469	-96,274	-1,231,171	500,760
Chemicals	-31,309,830	-40,675,847	-26,340,656	-47,044,925	-100,698,909	-45,952,753	-46,124,065	-102,643,954	-97,257,838	-111,998,908	-233,218,420	-367,726,316	-440,899,025
Rub, gls, Plstc,Nmm	-4,483,583	-8,641,317	-19,002,189	-16,986,103	-20,519,040	-34,068,714	-19,860,197	-14,603,761	-15,701,803	-5,399,885	-23,912,742	-28,580,982	-27,671,653
Basic Met.	14,320,812	47,607,222	26,526,251	-3,911,431	-14,385,567	-77,212,586	-43,687,643	-75,748,278	-127,769,578	-138,013,362	-401,425,416	-80,322,375	-9,333,552
Mach&Eq.	-18,876,456	-25,553,960	-22,257,113	-23,755,623	-29,611,904	-104,342,563	-133,850,491	-82,760,340	-113,667,226	-182,069,699	-480,300,970	-471,872,205	-982,894,005

Graph 14– European Union Sector Net Trade

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Agri, F,F	1,451,883,512	1,551,607,451	1,499,564,524	1,713,072,888	1,841,949,889	1,877,292,866	2,138,549,465	3,165,429,228	3,141,333,010	4,116,433,090	3,663,956,721	4,247,466,391	5,232,313,203
Mine&Qq	3,700,203,718	3,934,438,429	4,376,796,219	3,657,661,717	5,622,825,645	8,128,819,538	13,606,336,101	13,045,103,159	11,081,232,167	12,636,237,321	30,636,886,246	20,885,648,839	24,258,156,223
Food Proc.	462,370,511	639,765,315	522,955,754	525,630,179	354,760,954	218,502,518	612,007,584	159,259,518	381,911,928	388,510,074	1,144,069,108	1,891,629,707	2,777,689,680
Tex&App	-75,123,246	-18,772,966	52,412,255	117,358,433	-118,131,831	-52,325,172	-84,550,556	-26,650,031	-28,621,621	103,025,258	144,248,646	102,055,832	389,614,350
Leather&F	-42,777,335	1,805,078	26,511,685	61,628,897	105,844,932	120,103,501	85,079,258	82,797,047	100,968,694	105,309,272	385,669,160	214,197,760	17,960,837
Wood&Furn	136,440,757	150,716,520	140,692,978	183,155,248	566,406,529	1,161,206,359	1,259,238,774	1,450,373,960	1,883,052,288	2,008,493,603	2,098,708,497	2,260,237,461	3,432,537,768
Paper &P	-306,173,574	-241,593,424	-386,039,210	-668,304,354	-879,283,386	-849,668,151	-1,713,227,026	-1,468,193,945	-1,482,408,869	-1,408,367,648	-1,051,297,809	-703,045,630	-771,647,115
Petroleum	24,136,973	-39,602,847	19,758,633	77,485,953	174,268,119	-142,476,269	487,705,497	-107,072,415	-269,441,002	-249,220,317	-297,778,282	88,313,098	11,342,814
Chemicals	-2,942,134,153	-3,286,775,403	-3,497,568,825	-4,148,294,378	-4,985,784,035	-5,864,677,270	-6,574,194,139	-6,885,478,646	-7,867,492,966	-8,508,866,043	-9,323,026,819	-10,162,269,047	-12,645,924,821
Rub, gls, Plstc,Nmm	-879,976,750	-882,931,121	-867,330,545	-960,544,221	-1,206,409,607	-1,458,658,514	-1,811,138,875	-1,844,439,794	-2,157,327,950	-2,102,600,878	-2,252,224,329	-2,422,389,360	-2,531,449,390
Basic Met.	1,193,345,908	1,167,841,622	648,938,167	603,143,360	510,439,063	625,829,992	278,780,129	793,801,973	3,306,065,964	2,535,602,758	4,768,164,994	4,410,250,338	4,270,579,513
Mach&Eq.	-10,477,080,053	-9,958,187,760	-10,239,887,120	-10,680,638,540	-17,750,938,048	-21,768,943,149	-25,809,937,319	-25,927,047,100	-31,372,775,348	-23,319,578,266	-28,894,874,170	-34,124,294,843	-44,906,076,923

Graph 15 – Far East Sector Net Trade

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Agri, F,F	477,056,322	191,603,644	82,283,445	150,653,303	782,005,733	79,818,865	851,729,707	163,920,461	182,732,976	416,609,453	455,541,697	1,203,560,444	444,454,171
Mine&Qq	2,568,220,887	2,503,545,866	2,471,879,701	2,841,011,362	2,807,695,414	3,335,414,443	3,724,925,679	4,561,787,459	4,057,663,761	4,419,894,124	11,722,283,368	7,365,980,194	5,939,878,099
Food Proc.	375,144,349	293,859,679	-57,139,920	-102,416,962	-110,051,730	-14,045,600	183,003,931	-203,511,204	323,107,602	-181,195,801	114,229,780	737,761,892	507,810,128
Tex&App	-573,549,467	-753,025,903	-597,324,991	-737,898,642	-1,030,918,654	-1,088,809,767	-1,144,425,828	-1,413,506,133	-1,777,567,311	-1,875,887,071	-2,459,103,229	-2,525,774,443	-3,025,468,285
Leather&F	-127,758,343	-217,136,507	-198,000,225	-310,652,786	-319,625,472	-414,569,561	-480,345,197	-540,874,141	-535,991,037	-592,292,534	-655,188,206	-989,974,721	-1,599,356,641
Wood&Furn	-49,099,589	-81,419,759	-89,649,953	-53,329,273	192,454,702	299,776,291	303,252,695	374,918,040	554,481,125	694,180,024	729,451,369	1,120,022,007	1,508,329,920
Paper &P	374,735,559	279,412,780	423,489,395	429,000,688	542,458,043	1,050,602,720	814,480,315	757,761,829	696,489,708	893,108,141	1,541,136,205	976,451,607	972,145,284
Petroleum	-39,532,236	-32,068,830	-53,559,942	-45,103,787	-21,551,539	-3,438,320	-16,219,554	62,953,334	-213,554,988	-191,228,190	-185,257,834	-264,251,499	-244,446,634
Chemicals	-69,804,894	-73,064,891	-69,252,936	-264,974,516	-156,506,157	-140,130,057	-263,021,442	-216,178,304	-605,734,372	-661,493,848	-1,134,448,861	-1,014,646,382	-2,024,526,669
Rub, gls, Plstc,Nmm	-272,733,995	-332,009,584	-380,309,279	-448,493,849	-571,910,237	-705,399,585	-808,026,977	-1,044,654,218	-1,242,393,683	-1,465,212,524	-1,722,383,255	-1,986,174,148	-2,644,006,774
Basic Met.	2,484,006,602	3,101,443,469	2,934,874,882	2,965,222,523	3,601,373,664	4,148,902,392	6,928,194,572	8,373,390,734	5,218,710,249	7,723,061,011	9,223,418,953	8,210,712,170	13,442,080,618
Mach&Eq.	-4,683,700,710	-5,650,033,706	-5,982,470,379	-8,365,816,856	-9,699,343,667	-12,087,134,451	-13,322,435,145	-13,190,014,255	-15,996,542,455	-16,519,236,805	-20,856,296,512	-20,548,080,725	-26,132,169,462

Graph 16 – Middle East Sector Net Trade

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Agri, F,F	148,275,893	41,412,051	81,682,193	120,468,179	401,011,956	163,542,110	284,384,763	332,122,732	121,286,781	780,558,932	309,526,589	312,065,412	364,514,440
Mine&Qq	436,094,900	496,312,313	498,159,117	1,248,184,715	569,064,056	-5,194,091,235	-6,427,628,441	-10,035,253,119	-6,069,109,509	-8,803,804,144	-19,406,481,628	-19,515,920,263	-16,401,394,199
Food Proc.	209,643,799	167,314,262	49,962,754	74,504,067	92,018,208	130,974,177	187,950,109	175,111,292	274,047,844	515,618,570	717,206,831	879,841,631	402,190,976
Tex&App	-107,090,881	-125,123,745	-146,781,531	-155,416,114	-279,030,801	-337,699,987	-337,473,631	-465,065,871	-504,052,866	-429,872,161	-607,044,342	-525,573,779	-652,427,233
Leather&F	-49,550,911	-51,652,520	-42,993,068	-62,251,848	-113,431,891	-135,598,611	-145,141,386	-196,566,964	-181,862,486	-170,383,096	-153,314,091	-177,002,319	-41,240,250
Wood&Furn	-62,694,635	-55,379,703	-27,800,015	-57,396,349	-47,298,380	-71,288,821	-52,666,683	5,912,229	-119,197	12,993,490	-1,648,745	12,922,795	3,829,564
Paper &P	148,837,204	128,965,368	127,148,700	133,954,787	132,334,573	178,958,394	168,097,500	173,718,863	238,204,886	285,693,927	492,936,270	491,904,655	447,502,924
Petroleum	-264,049	-2,850,088	-2,075,272	-1,328,424	2,358,284	333,824,322	-152,207,783	413,416,802	-299,004,743	-151,626,610	137,102,359	55,953,722	76,589,435
Chemicals	-23,395,294	-59,239,860	-32,926,727	-81,224,046	71,194,394	113,178,515	88,060,446	181,214,025	256,587,887	419,728,476	275,014,723	471,182,053	-80,370,628
Rub, gls, Plstc,Nmm	-26,753,199	-22,881,986	-19,717,035	-40,748,982	-22,074,085	-59,248,612	-91,261,291	-143,848,283	-176,498,642	-141,220,956	-131,670,042	-155,189,237	-158,505,170
Basic Met.	910,104,126	968,510,606	1,000,495,957	985,547,781	942,026,579	1,389,245,929	2,032,920,213	1,302,088,717	1,571,065,989	1,637,963,761	1,575,674,852	2,279,564,958	2,007,118,657
Mach&Eq.	-236,596,083	-293,285,901	-429,180,322	-200,617,460	-775,996,940	-907,130,127	-1,107,139,114	-992,215,866	-1,355,531,232	-1,209,932,925	-603,644,544	-207,916,775	-864,055,080

Graph 17 – North America Sector Net Trade

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Agri, F,F	-211,817,436	-144,427,418	-1,074,439,151	-756,595,876	-159,752,348	-676,946,023	-485,664,609	-282,147,861	-139,721,058	16,564,329	-275,349,066	300,454,447	-322,556,873
Mine&Qq	111,176,227	124,847,665	40,059,195	404,672,994	260,402,764	139,191,696	309,319,101	1,170,612,060	2,231,096,560	1,631,750,251	10,989,616,736	5,948,626,248	2,329,672,682
Food Proc.	-151,490,926	-168,369,952	-163,553,637	-63,083,002	-112,099,086	-300,425,712	-164,870,066	-304,447,137	-268,641,694	-250,371,517	115,933,461	270,989,938	355,617,822
Tex&App	-30,990,036	-46,751,182	-9,067,063	12,384,922	88,080,095	92,113,951	108,730,967	173,804,336	218,238,223	410,473,701	1,124,111,374	1,262,827,798	1,745,015,661
Leather&F	-6,822,792	-6,919,062	2,064,055	43,206,606	73,566,527	53,084,831	25,464,855	34,972,688	1,651,811	23,383,204	96,536,350	134,603,483	14,384,631
Wood&Furn	-54,597,612	-77,452,445	-75,878,063	-97,374,081	-44,569,432	-81,790,038	-89,004,636	-141,863,945	-106,493,816	-107,872,001	19,047,203	-11,590,318	108,304,909
Paper &P	-249,866,901	-348,705,370	-239,549,922	-377,255,017	-336,673,292	-448,078,761	-912,478,459	-858,813,380	-845,110,865	-754,753,244	-678,092,538	-966,798,919	-895,725,698
Petroleum	-48,544,118	-44,987,324	185,026,825	70,451,386	-20,798,602	-108,728,280	-153,929,829	59,141,565	-347,186,652	-533,173,925	-232,446,874	-455,375,095	-646,841,520
Chemicals	-801,876,701	-840,099,743	-450,034,325	-547,424,720	-492,499,732	-676,738,895	-414,279,438	-628,721,108	-1,473,026,233	-1,288,167,187	-1,327,538,305	-1,583,886,598	-895,689,684
Rub, gls, Plstc,Nmm	-122,084,523	-137,528,213	-140,256,469	-147,618,195	-186,304,261	-277,701,901	-322,904,179	-318,797,531	-397,298,416	-425,242,581	-629,574,205	-651,163,426	-647,547,415
Basic Met.	631,268,186	497,889,970	821,409,779	1,061,928,832	1,705,847,933	1,345,772,815	1,838,024,988	1,773,070,361	3,192,067,431	3,174,211,038	4,980,867,590	3,837,110,761	4,635,358,900
Mach&Eq.	-2,485,683,170	-3,573,983,911	-3,344,757,992	-3,957,803,182	-5,016,040,492	-5,955,777,644	-7,470,404,771	-8,420,628,091	-10,407,845,650	-10,515,830,055	-10,342,206,989	-11,008,889,259	-12,281,130,468

Graph 18 – South America Sector Net Trade

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Agri, F,F	-27,358,225	-90,325,448	-375,995,240	-75,574,969	33,199,481	-290,363,496	7,690,004	10,060,819	-226,484,733	-194,115,326	-315,949,275	-446,467,943	-749,839,046
Mine&Qq	67,283,229	50,420,949	74,554,463	114,100,133	139,942,679	280,010,638	270,815,320	493,254,544	-446,322,641	281,476,660	300,057,795	562,664,615	394,473,850
Food Proc.	-345,122,137	-212,920,806	-286,003,254	-109,379,873	-356,025,139	-694,144,311	-657,146,020	-1,028,728,945	-902,312,474	-886,256,613	-1,019,227,189	-1,595,812,615	-1,869,323,894
Tex&App	-11,354,039	-1,940,536	-2,428,249	1,667,261	5,139,869	17,603,426	17,497,271	21,338,542	12,891,906	14,757,664	22,607,996	35,105,914	15,342,090
Leather&F	-13,251,507	-13,508,167	-20,012,938	-20,675,953	-40,115,203	-35,404,388	-51,244,498	-64,112,030	-58,429,013	-69,364,648	-107,321,600	-73,112,358	-36,790,485
Wood&Furn	-21,039,316	-24,665,658	-10,645,745	-19,847,991	-27,717,574	-31,160,189	-14,738,905	-53,423,930	-63,056,275	-56,457,313	-69,526,793	-47,442,936	-45,737,698
Paper &P	58,374,425	50,555,458	100,813,906	104,970,451	79,462,186	104,520,644	40,079,706	70,754,730	152,514,195	89,992,336	130,481,587	258,788,927	14,378,688
Petroleum	-785,349	3,543,294	10,351,098	26,255,794	24,546,232	117,835,373	33,654,213	14,583,884	-20,757,370	-12,844,694	14,016,924	14,171,017	16,577,009
Chemicals	-58,041,182	-25,249,068	4,003,637	3,423,534	-18,500,710	3,847,417	93,978,450	138,891,374	306,407,036	117,661,076	234,736,436	412,344,060	136,809,302
Rub, gls, Plstc,Nmm	-37,415,306	-37,227,585	-15,463,168	-15,895,738	-24,585,533	-41,007,948	-39,968,058	-25,602,234	-7,303,270	-30,296,969	-63,988,151	-109,963,156	-242,438,049
Basic Met.	162,855,805	267,294,503	254,298,028	200,206,341	237,390,597	249,229,890	223,392,909	278,052,993	408,697,110	172,187,691	488,596,348	627,781,816	492,772,118
Mach&Eq.	-28,985,182	-122,371,671	-91,140,004	-80,591,559	-100,545,036	-51,805,303	-253,262,816	-467,642,043	-366,470,340	-347,669,724	-608,202,882	-1,059,194,496	-2,265,509,640

Graph 19 – SADC Sector Net Trade

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Agri, F,F	-75,445,202	-145,284,575	-89,521,131	-201,501,206	-263,017,910	-44,524,488	237,940,365	-264,626,867	296,494,043	186,930,684	-152,019,240	61,424,404	1,070,451,759
Mine&Qq	22,511,889	35,326,800	186,185,289	-78,088,405	-326,139,388	-238,969,958	-638,282,498	-39,244,876	343,294,760	245,640,197	246,839,055	545,991,580	-194,191,304
Food Proc.	342,182,377	538,036,936	571,606,810	681,795,213	765,577,133	1,122,217,742	1,367,894,472	1,358,128,919	1,715,474,244	2,009,791,692	1,999,542,879	2,426,206,070	3,602,915,460
Tex&App	106,065,468	177,586,306	84,221,056	98,944,581	90,237,023	84,851,217	150,321,927	253,114,382	-95,099,176	237,554,138	270,575,432	317,900,716	307,190,461
Leather&F	-17,767,260	-18,905,301	-26,889,236	-27,280,929	-42,452,978	-45,681,283	8,722,405	14,262,555	12,001,367	16,727,525	24,045,737	17,223,797	38,092,634
Wood&Furn	1,865,811	17,674,625	-13,083,518	51,487,779	38,247,439	27,387,270	-32,215,888	23,986,928	92,148,345	118,404,335	116,286,842	148,396,682	208,222,198
Paper &P	140,167,698	200,380,150	180,107,912	234,186,910	506,665,571	381,401,091	703,866,373	465,623,542	562,718,573	631,029,916	829,521,262	874,016,446	936,972,562
Petroleum	18,347,278	25,895,206	22,854,594	21,629,932	47,446,048	1,603,463,403	1,702,073,488	1,673,882,061	1,033,537,755	1,179,510,193	897,270,947	290,188,570	158,310,511
Chemicals	679,300,134	809,803,459	877,439,592	1,020,698,310	1,290,075,616	1,458,749,260	2,088,132,308	2,311,403,807	2,396,345,283	2,596,800,659	3,745,914,897	3,573,098,378	4,698,796,271
Rub, gls, Plstc,Nmm	157,617,349	222,919,586	228,197,194	312,807,816	345,393,129	440,288,106	640,560,934	731,407,068	847,917,053	913,079,106	1,103,208,927	1,301,257,446	1,631,785,937
Basic Met.	645,101,009	728,905,760	713,369,047	760,283,992	798,721,687	1,626,850,566	1,449,705,478	1,604,020,169	1,514,776,325	1,897,855,179	2,449,657,911	2,178,595,606	3,055,838,380
Mach&Eq.	844,098,377	1,169,370,611	1,374,602,793	1,643,660,019	1,947,146,616	3,024,946,285	4,272,541,010	4,329,543,456	4,497,579,729	4,461,772,908	5,241,752,293	6,343,163,686	8,524,376,560

Comparison of Labour Use Between blocs - Appendix 3

Data for Figures 20-37

Figure 20 – Total Labour WALC Direct Effects Exports

Year	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
1990	7.49	6.26	5.6	5.2	3.9	4.01	2.69
1991	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1992	7.54	6.67	5.03	4.96	2.47	4.4	3.16
1993	6.73	6.94	5.28	5.73	4.06	3.89	2.42
1994	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1995	6.81	6.6	4.87	4.9	4.09	3.6	3.53
1996	6.66	6.67	4.96	5.08	4.13	3.98	4.79
1997	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1998	7.2	6.39	4.69	4.92	4.92	4.39	3.9
1999	9.41	6.59	4.68	5.86	4.93	4.27	3.95
2000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2001	7.51	6.2	5.2	5.03	5.24	4.29	4.01
2002	8.03	6.29	4.58	5.4	4.75	4.75	3.93
Total	93.75	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Average	7.81	7.2	5.45	5.72	4.79	4.43	4.24
Position	1	2	4	3	5	6	7

Figure 21 – Total Labour WALC Indirect Effects Exports

Year	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
1990	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1991	11.51	13.04	10.85	10.67	9.86	11.09	9.17
1992	12.97	13.1	10.74	10.63	9.73	11.28	9.13
1993	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1994	12.7	12.98	11.56	11.99	10.12	11.17	11.96
1995	12.37	12.71	10.77	10.85	10.27	11.02	10.41
1996	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1997	13.77	12.97	10.33	11.59	10.65	11.18	11.76
1998	13.63	12.57	10.39	10.98	10.7	11.57	9.79
1999	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2000	12.87	12.35	10.87	11.24	11.41	10.87	9.64
2001	13.95	12.35	11.21	11.05	11.52	11.39	9.93
2002	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total	172.5	166.13	141.31	145.66	136.75	146.47	132.41
Average	13.27	12.78	10.87	11.2	10.52	11.27	10.19
Position	1	2	[illegible]	4	[illegible]	3	7

Figure 22 - Total Labour WALC CGE Effects Exports

Year	Eastern Europe	EU	Far East	Middle East	Northern America	South America	SADC
1990	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1991	0.323	0.895	0.459	-0.16	0.567	-0.46	1.415
1992	2.896	1.011	0.509	0.148	0.148	-0.409	1.298
1993	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1994	1.223	1.179	0.556	-0.002	0.7	-0.16	1.422
1995	0.654	1.272	0.519	-0.281	0.715	-0.105	0.58
1996	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1997	0.447	1.333	0.462	0.053	0.712	0.172	0.905
1998	0.748	1.582	0.529	0.174	0.788	-0.123	0.86
1999	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2000	0.96	1.292	0.57	0.251	1.192	0.032	0.932
2001	0.897	1.616	0.606	0.269	1.26	0.054	1.221
2002	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total	13.5	17	7.3	0.5	11.3	-1	14.5
Average	1	1.3	0.6	0	0.9	-0.1	1.1
Position	3	1	5	6	4	7	2

Figure 23 - Semi / Unskilled Labour WALC Direct Effects Exports

Year	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
1990	5.88	5.33	4.19	3.98	2.51	2.55	2.24
1991	4.66	5.29	3.61	3.48	2.49	2.45	1.72
1992	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1993	4.95	5.33	3.83	4.21	2.69	2.49	2.05
1994	4.26	5.21	4.32	4.78	2.6	2.47	3.19
1995	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1996	5.13	5.06	3.6	3.73	2.74	2.56	3.41
1997	6.66	5.34	3.11	3.85	3.02	2.42	3.86
1998	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1999	6.92	4.88	3.3	4.42	3.34	2.82	2.54
2000	5.38	4.81	3.78	3.66	4.08	2.33	2.28
2001	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2002	6.43	4.59	3.14	3.91	3.15	3.24	2.59
Total	72.56	65.34	46.94	50.24	38.53	34.21	32.85
Average	6.05	5.44	3.91	4.19	3.21	2.85	2.74
Position	1	2	4	3	5	6	7

Figure 24 - Semi / Unskilled Labour WALC Indirect Effects Exports

Year	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
1990	8.23	8.13	6.94	6.79	5.03	5.85	4.75
1991	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1992	8.78	8.25	6.22	6.09	4.98	6.24	4.48
1993	7.85	8.32	6.45	6.69	5.52	5.91	5.1
1994	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1995	7.68	7.81	6.15	6.27	5.51	5.81	5.45
1996	8.35	7.89	6.21	6.53	5.66	6.09	6.88
1997	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1998	8.75	7.62	6.18	6.31	6.01	6.36	5.06
1999	10.47	8.66	6.26	7.91	6.89	6.26	5.7
2000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2001	8.98	7.3	6.49	6.31	6.53	6.15	5.08
2002	9.3	7.41	5.87	6.51	6.14	6.83	5.01
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Average	8.47	7.95	6.27	6.65	5.79	6.1	5.46
Position	1	2	4	3	6	5	7

Figure 25 - Semi / Unskilled Labour WALC CGE Effects Exports

Year	Eastern Europe	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1990	1.54	1.64	0.83	0.43	-0.04	0.67	-0.34
1991	0.96	1.75	0.66	0.28	0.08	0.77	-0.71
1992	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1993	2.23	1.92	0.81	0.84	0.28	0.77	-0.32
1994	1.55	1.83	1.03	0.96	0.32	0.76	0.46
1995	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1996	1.58	1.75	0.59	0.45	0.32	0.47	0.54
1997	2.03	1.93	0.38	0.64	0.49	0.49	0.71
1998	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1999	2.27	1.93	0.56	0.79	0.83	0.76	-0.21
2000	1.71	1.64	0.72	0.56	1.17	0.42	-0.29
2001	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2002	2.25	1.74	0.65	0.59	1.24	1.04	-0.33
Total	24.97	23.18	8.98	7.1	6.77	8.79	-1.72
Average	1.92	1.78	0.69	0.55	0.52	0.68	-0.13
Position	1	2	3	5	6	4	7

Figure 26 - Skilled Labour WALC Direct Effects Exports

Year	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
1990	1.08	1.01	0.95	0.89	0.93	0.95	0.97
1991	1.05	1.03	0.93	0.89	0.96	0.97	0.85
1992	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1993	1.18	1.06	0.98	1.01	0.9	0.99	0.93
1994	1.04	1.07	0.97	0.94	0.9	1	0.87
1995	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1996	1.02	1.09	0.92	0.89	0.91	0.92	0.9
1997	1.07	1.11	0.92	0.92	0.94	0.92	0.94
1998	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1999	1.03	1.12	0.93	0.94	0.98	0.94	0.93
2000	1.07	1.12	1	0.88	1.05	0.94	0.93
2001	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2002	1.01	1.13	0.97	0.99	1.04	0.98	0.87
Total	13.94	14.1	12.44	12.16	12.42	12.39	11.9
Average	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Position	2	1	3	6	5	4	7

Figure 27 – Professional Labour WALC Direct Effects Exports

Year	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
1990	0.25	0.27	0.26	0.24	0.22	0.36	0.25
1991	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1992	0.35	0.28	0.28	0.29	0.23	0.36	0.22
1993	0.35	0.29	0.29	0.29	0.22	0.37	0.22
1994	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1995	0.29	0.3	0.29	0.27	0.24	0.34	0.33
1996	0.26	0.29	0.27	0.27	0.22	0.35	0.3
1997	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1998	0.28	0.31	0.27	0.3	0.22	0.35	0.24
1999	0.25	0.33	0.27	0.27	0.23	0.35	0.24
2000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2001	0.29	0.34	0.29	0.31	0.26	0.37	0.27
2002	0.29	0.33	0.3	0.31	0.29	0.36	0.22
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Average	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Position	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Figure 28 – Informal Labour WALC Direct Effects Exports

Year	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
1990	0.28	0.25	0.21	0.2	0.15	0.15	0.14
1991	0.23	0.26	0.19	0.18	0.15	0.14	0.11
1992	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1993	0.25	0.26	0.2	0.21	0.15	0.15	0.13
1994	0.22	0.26	0.22	0.23	0.15	0.15	0.17
1995	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1996	0.25	0.25	0.19	0.19	0.15	0.15	0.18
1997	0.31	0.26	0.17	0.2	0.17	0.14	0.2
1998	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1999	0.31	0.25	0.17	0.22	0.18	0.16	0.15
2000	0.26	0.24	0.2	0.19	0.21	0.14	0.14
2001	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2002	0.3	0.23	0.17	0.2	0.18	0.18	0.15
Total	3.5	3.22	2.44	2.55	2.13	1.96	1.88
Average	0.29	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Position	1	2	4	3	5	6	6

NET TRADE

Figure 29 - Total Labour WALC Direct Effects Net Trade

Year	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
1990	2.06	2.69	0.21	-1.47	-0.7	-5.92	0.05
1991	1.29	2.29	-0.41	-1.95	-0.47	-6.71	-1.72
1992	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1993	3.1	2.81	0.04	-0.4	-0.45	-5.58	-0.51
1994	1.98	2.73	0.61	-0.88	-1.04	-5.1	-0.25
1995	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1996	2.26	2.51	-0.1	-2.09	-0.4	-5.73	0.49
1997	3.71	2.9	-0.47	-1.34	-0.01	-7.05	-0.04
1998	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1999	4.86	2.41	-0.03	-1.3	0.26	-4.47	-0.82
2000	2.99	2.27	0.21	-1.99	1.51	-6.2	-1.07
2001	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2002	2.1	2.02	-0.45	-1.47	0.35	-5.44	-1.15
Total	34.44	32.64	-1.9	-20.89	-2.39	-73.65	-6.76
Average	2.87	2.72	-0.07	[illegible]	[illegible]	[illegible]	[illegible]
Position	1	2	3	6	4	7	5

Figure 30 – Total Labour WALC Indirect Effects Net Trade

Year	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
1990	1.14	2.06	-1.12	-2.66	-1.57	-6.02	-3.01
1991	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1992	1.37	2.34	-1.8	-2.36	-3.06	-6.08	-6.33
1993	0.61	2.54	-1.45	-2.79	-2	-6.2	-2.4
1994	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1995	4.14	7.78	5.63	-1.75	3.37	-7.36	-6.84
1996	2.35	1.83	-1.38	-3.35	-1.54	-4.1	-1.12
1997	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1998	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1999	4.45	1.97	-1.66	-2.44	-0.31	-6.13	-2.79
2000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2001	3.22	1.49	-0.87	-1.13	0.58	-5.78	-3.03
2002	2.19	1.6	-1.54	-0.89	0.1	-4.94	-3.35
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Average	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Position	2	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Figure 31 - Total Labour WALC CGE Effects Net Trade

Year	Eastern Europe	European Union	Far East	Middle East	Northern America	South America	SADC
1990	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1991	-1.06	-1.09	-2.83	-3.99	-1.4	-1.3	-1.15
1992	2.55	-0.88	-3.4	-3.39	-1.54	-0.77	-2.1
1993	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1994	0.18	-0.83	-3.36	-4.04	-1.39	-0.83	-1.57
1995	-0.74	-0.57	-3.1	-1.77	-1.1	-0.56	-2.5
1996	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1997	-0.39	-0.64	-3.22	-2.11	-1.36	-0.95	-1.94
1998	-0.32	-0.56	-2.94	-1.19	-1.19	-1.02	-2.94
1999	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2000	-0.2	-0.68	-3.11	-3.57	-0.83	-1.22	-1.8
2001	-0.8	-0.57	-2.72	-3.49	-0.35	-1.03	-1.85
2002	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total	-2.82	-9.23	-41.63	-26.66	-13.92	-12.87	-24.62
Average	-0.22	-0.71	-3.2	-2.05	-1.07	-0.99	-1.89
Position	1	2	7	6	4	3	5

Figure 32 - Semi / Unskilled Labour WALC Direct Effects Net Trade

Year	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
1990	2.11	2.87	0.78	-0.17	-0.37	-5.58	-0.12
1991	1.35	2.94	0.11	-1.45	-0.15	-6.51	-1.6
1992	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1993	2.8	2.96	0.47	-0.07	-0.05	-5.33	-0.63
1994	1.93	2.83	1.02	-0.67	-0.65	-4.89	-0.35
1995	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1996	2.21	2.61	0.36	-1.72	-0.03	-5.37	0.67
1997	3.56	2.99	-0.02	-1.05	0.31	-6.62	-0.03
1998	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1999	4.77	2.45	0.14	-0.82	0.63	-4.23	-0.79
2000	2.96	2.36	0.66	-1.79	1.69	-5.96	-1.02
2001	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2002	2.22	2.08	-0.06	-1.29	0.5	-5.19	-1.01
Total	33.7	33.95	4.67	-16.03	1.75	-69.9	-8.76
Average	2.81	2.83	0.39	-1.33	0.15	-5.82	-0.73
Position	2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Figure 33 - Semi / Unskilled Labour WALC Indirect Effects Net Trade

Year	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
1990	1.75	2.87	0.2	-1.69	-0.72	-6	-2.5
1991	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1992	1.43	2.99	-0.52	-0.31	-2.36	-6.06	-5.99
1993	0.8	3.1	-0.17	-0.89	-1.15	-5.39	-2.08
1994	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1995	3.07	5.07	2.93	-1.52	1.2	-6.49	-6.14
1996	2.92	2.63	-0.11	-1.13	-0.32	-4.28	-0.71
1997	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1998	2.73	2.35	-0.26	-1.25	0.37	-6.39	-2.72
1999	5.37	2.4	0.31	0.33	1.3	-4.65	-1.71
2000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2001	3.59	2.01	0.16	-1.28	1.24	-5.78	-2.49
2002	2.45	2.1	-0.5	-0.93	0.58	-5.12	-2.55
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Average	2.57	2.87	-0.09	-1.09	0.05	-5.61	-2.61
Position	2	1	3	5	4	7	6

Figure 34 – Semi / Unskilled Labour WALC CGE Effects Net Trade

Year	Eastern Europe	EU	Far East	Middle East	Northern America	SADC	South America
1990	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1991	-0.12	0.99	-1.96	-2.89	-0.79	-3.92	-1.89
1992	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1993	0.97	1.26	-1.51	-1.86	-1.16	-3.25	-1.47
1994	1.16	1.05	-1.3	-1.97	-0.69	-3.47	-0.57
1995	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1996	0.95	0.98	-1.49	-1.19	-0.69	-3.23	-0.49
1997	1.63	1.13	-1.79	-1.13	-0.47	-3.76	-0.55
1998	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1999	1.89	1.26	-1.52	-0.76	-0.07	-3.72	-1.31
2000	1.52	0.82	-1.39	-0.99	0.24	-3.36	-1.64
2001	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2002	0.84	0.86	-1.29	-0.81	0.23	-3.27	-1.66
Total	14.77	12.94	-19.79	-20.5	-6.53	-47.99	-19.53
Average	1.14	1	-1.52	-1.58	-0.5	-3.69	-1.49
Position	1	2	5	6	3	7	4

Figure 35 – Skilled Labour WALC Direct Effects Net Trade

Year	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
1990	-0.66	-0.58	-0.67	-0.26	-0.44	0.46	-0.82
1991	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1992	-0.51	-0.49	-0.66	-0.43	-0.25	0.57	-0.37
1993	-0.47	-0.52	-0.67	-0.55	-0.49	0.64	-0.64
1994	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1995	-0.76	-0.52	-0.5	0.39	-0.44	0.57	-0.49
1996	-0.09	-0.57	-0.6	0.35	-0.4	0.59	-0.6
1997	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1998	-0.28	-0.47	-0.46	0.39	-0.61	0.49	-0.64
1999	-0.44	-0.44	-0.56	0.4	-0.49	0.36	-0.63
2000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2001	-0.12	-0.4	-0.43	0.45	-0.47	0.7	-0.48
2002	-0.24	-0.39	-0.41	0.33	-0.28	0.64	-0.72
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Average	-0.47	-0.56	-0.62	0.34	-0.49	0.61	-0.59
Position	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Figure 36 – Professional Labour WALC Direct Effects Net Trade

Year	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
1990	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1991	-0.12	-0.19	-0.21	-0.14	-0.12	0.14	0
1992	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1993	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1994	-0.08	-0.17	-0.2	-0.04	-0.12	0.12	0.01
1995	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1996	-0.09	-0.17	-0.2	-0.03	-0.12	0.09	0
1997	-0.09	-0.18	-0.19	-0.03	-0.12	0.08	0.02
1998	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1999	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2000	-0.12	-0.16	-0.19	0.03	-0.16	0.09	0.02
2001	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2002	-0.09	-0.14	-0.17	0.01	-0.08	0.11	-0.01
Total	-1.28	2.14	2.51	0.64	1.58	1.3	0.28
Average	-0.11	-0.18	-0.21	-0.05	-0.13	0.11	0.02
Position	4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Figure 37 – Informal Labour WALC Direct Effects Net Trade

Year	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
1990	0.08	0.1	0.01	-0.06	-0.02	-0.22	0
1991	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1992	0.09	0.11	0	-0.04	-0.08	-0.2	-0.06
1993	0.12	0.11	0	-0.01	-0.02	-0.21	-0.02
1994	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1995	0.11	0.1	0	-0.08	-0.02	-0.19	-0.02
1996	0.09	0.1	0	-0.08	-0.01	-0.22	0.02
1997	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1998	0.13	0.09	-0.01	-0.08	0.02	-0.2	-0.02
1999	0.18	0.09	-0.01	-0.05	0.02	-0.17	-0.03
2000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2001	0.06	0.07	0.01	-0.07	0.04	-0.22	-0.04
2002	0.08	0.08	-0.02	-0.06	0.02	-0.21	-0.04
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Average	0.11	0.1	0	-0.06	-0.01	-0.23	-0.03
Position	1	2	3	6	4	7	5

Appendix 4:	Countries in each Bloc																		
Eastern Europe	**E.U.**	**Far East**	**Middle East**	**Northern America**	**South America**	**SADC**													
Albania	Austria	Cambodia	Afghanistan	Anguilla	Argentina	Angola													
Armenia	Belgium	China	Bahrain	Antigua and Barbuda	Bolivia	Congo													
Azerbaijan	Denmark	East Timor	Bangladesh	Aruba	Brazil	Republic of the													
Belarus	Finland	Hong Kong	Bhutan	Bahamas	Chile	Malawi													
Bosnia and Herzegowina	France	Indonesia	Cyprus	Barbados	Colombia	Mauritius													
Bulgaria	Germany	Japan	India	Belize	Ecuador	Mozambique													
Croatia	Greece	Macau	Iran (Islamic Republic of)	Bermuda	French Guiana	Seychelles													
Czech Republic	Ireland	Malaysia	Iraq	Canada	Guatemala	Republic of													
Czechoslovakia	Italy	Mongolia	Israel	Costa Rica	Guyana	Zaire													
Estonia	Luxembourg	Papua New Guinea	Jordan	Cuba	Paraguay	Zambia													
Georgia	Netherlands	Philippines	Korea, Democratic Peoples Republic of	Dominica	Peru	Zimbabwe													
Hungary	Norway	China	Korea, Republic of	Dominican Republic	Suriname														
Kazakhstan	Portugal	Thailand	Kuwait	El Salvador	Uruguay														
Kyrgyzstan	Spain		Lao People's Democratic Republic	Grenada	Venezuela														
Latvia	Sweden		Lebanon	Haiti															
Lithuania	Switzerland		Maldives	Honduras															
Moldova, Republic of	United Kingdom		Myanmar	Jamaica															
Poland			Nepal	Martinique															
Romania			Neutral Zone	Mexico															
Russian Federation			Oman	Montserrat															
Slovakia (Slovak Republic)			Pakistan	Netherlands Antilles															
Slovenia			Qatar	Nicaragua															
Tajikistan			Saudi Arabia	Panama															
Turkmenistan			Singapore	Puerto Rico															
Ukraine			Sri Lanka	United States															
USSR			Syrian Arab Republic																
Uzbekistan			Turkey																
Yugoslavia			Turks and Caicos Islands																
			United Arab Emirates																
			Viet Nam																
			Yemen																
			Yemen Democratic Republic																

APPENDIX 5

Table A2.3: Direct, Total and Equilibrium Labor Coefficients

(Workers per R1 million)

Sector	Direct coefficient	Total coefficient	Multiplier (total/direct)	CGE coefficient
All labor				
Agriculture, forestry, and fishing	18.42	23.63	1.28	-0.80
Mining and quarrying	7.71	12.26	1.59	0.26
Food processing	1.99	14.22	7.13	0.13
Textiles and apparel	12.07	22.26	1.84	15.29
Leather goods and footwear	7.79	15.58	2.00	8.73
Wood and furniture	8.52	17.11	2.01	12.44
Paper and printing	3.30	10.22	3.10	-1.13
Petroleum products	0.72	10.40	14.39	-3.96
Chemicals	1.99	7.20	3.62	-2.32
Rubber, glass, plastic, non-metal. minerals	2.49	9.29	3.73	0.99
Basic metals	2.14	7.18	3.36	-0.77
Machinery and equipment	4.63	11.56	2.49	3.59
Electricity, gas, water	2.87	6.48	2.26	-7.16
Construction	8.84	17.40	1.97	15.51
Trade	6.85	10.97	1.60	1.00
Tourism	12.66	20.03	1.58	7.18
Transport and storage	4.57	9.02	1.97	1.04
Financial & business services	4.28	7.71	1.80	-7.81
Medical and health services	2.71	7.74	2.86	-10.69
Social and personal services	47.55	51.46	1.08	40.17
General gov. and other producers	17.50	17.67	1.01	1.58
Semi-skilled and unskilled labor				
Agriculture, forestry, and fishing	16.65	19.18	1.15	6.35
Mining and quarrying	6.00	7.88	1.31	1.44
Food processing	1.11	8.73	7.88	0.81
Textiles and apparel	9.28	15.17	1.64	11.81
Leather goods and footwear	6.60	10.99	1.66	7.06
Wood and furniture	5.77	10.27	1.78	8.50
Paper and printing	1.23	4.03	3.27	-1.57
Petroleum products	0.30	5.01	16.89	-2.89
Chemicals	0.82	2.86	3.50	-2.27
Rubber, glass, plastic, non-metal. minerals	1.55	4.73	3.05	0.55
Basic metals	1.18	3.40	2.87	-1.28
Machinery and equipment	2.62	5.44	2.08	1.56
Electricity, gas, water	1.38	3.02	2.19	-4.44
Construction	3.52	6.88	1.96	5.09
Trade	1.37	2.51	1.82	-3.62
Tourism	1.79	5.51	3.07	-1.31
Transport and storage	0.66	2.16	3.26	-3.55
Financial & business services	0.14	1.13	7.87	-8.04
Medical and health services	0.10	1.84	18.08	-7.42
Social and personal services	23.43	24.78	1.06	20.18
General gov. and other producers	2.51	2.57	1.02	-3.30

Source: South Africa CGE model

APPENDIX 6

Table A2.1: Output, Value Added and Factor Use, 2000

Sector	Output structure	Value added structure	Employment structure	Capital/ labor ratio
Agriculture, forestry, and fishing	3.8%	5.6%	9.2%	63.80
Mining and quarrying	5.8%	6.2%	6.7%	193.33
Food processing	8.8%	3.5%	2.3%	181.72
Textiles and apparel	1.5%	1.0%	2.4%	21.74
Leather goods and footwear	0.3%	0.2%	0.3%	25.56
Wood and furniture	1.1%	0.7%	1.2%	32.31
Paper and printing	2.5%	1.7%	1.1%	119.37
Petroleum products	1.8%	0.8%	0.2%	2544.12
Chemicals	3.8%	2.2%	1.0%	285.75
Rubber, glass, plastic, non-metal. mins.	5.4%	3.2%	1.8%	98.55
Basic metals	2.9%	2.4%	0.8%	744.54
Machinery and equipment	7.0%	4.5%	4.4%	70.77
Electricity, gas, water	2.7%	3.3%	1.0%	1321.11
Construction	5.2%	3.1%	6.0%	24.79
Trade	10.9%	12.7%	10.1%	90.82
Tourism	1.5%	1.1%	2.5%	30.09
Transport and storage	7.1%	8.0%	4.2%	500.20
Financial & business services	15.2%	18.3%	8.6%	574.72
Medical and health services	1.9%	1.9%	0.7%	171.61
Social and personal services	2.4%	3.2%	15.5%	4.89
General gov. and other producers	8.4%	16.3%	20.0%	168.40
TOTAL	**100.0%**	**100.0%**	**100.0%**	**174.34**

Source: South Africa CGE model.

Table A2.2: Sectoral Labor/Output Coefficients, 2000

(Workers/million R)

Sector	Professional labor	Skilled labor	Semi-skilled & unskilled labor	Informal labor	TOTAL labor
Agriculture, forestry, and fishing	0.08	1.00	16.65	0.69	18.42
Mining and quarrying	0.25	1.16	6.01	0.29	7.71
Food processing	0.16	0.66	1.11	0.07	2.00
Textiles and apparel	0.52	1.82	9.28	0.45	12.07
Leather goods and footwear	0.27	0.63	6.61	0.29	7.79
Wood and furniture	0.36	2.08	5.77	0.32	8.52
Paper and printing	0.48	1.46	1.23	0.12	3.30
Petroleum products	0.15	0.25	0.30	0.03	0.72
Chemicals	0.42	0.68	0.82	0.07	1.99
Rubber, glass, plastic, non-met. minerals	0.23	0.62	1.55	0.09	2.49
Basic metals	0.22	0.66	1.19	0.08	2.14
Machinery and equipment	0.55	1.30	2.62	0.17	4.64
Electricity, gas, water	0.37	0.56	1.38	0.56	2.87
Construction	0.26	1.10	3.52	3.97	8.84
Trade	0.75	3.37	1.37	1.36	6.85
Tourism	1.12	9.27	1.80	0.47	12.66
Transport and storage	0.18	1.30	0.66	2.43	4.57
Financial & business services	0.70	2.32	0.14	1.12	4.28
Medical and health services	1.08	1.08	0.10	0.45	2.71
Social and personal services	3.36	5.40	23.43	15.36	47.55
General gov. and other producers	6.53	8.09	2.51	0.37	17.50
TOTAL	**1.01**	**2.25**	**2.95**	**1.21**	**7.42**

Source: South Africa CGE model

Appendix 7

EXPORTS

Table 5: Average level in WALC for each region 1990 - 2002

Exports: Total Labour

	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
Direct Effects	7.21	6.65	5.03	5.28	4.42	4.09	3.91
Indirect Effects	13.27	12.78	10.87	11.20	10.52	11.27	10.19
CGE Effects	1.04	1.31	0.56	0.04	0.86	1.12	-0.08

Exports: Semi / Unskilled Labour

	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
Direct Effects	5.58	5.02	3.61	3.86	2.96	2.63	2.53
Indirect Effects	9.65	9.00	7.20	7.44	6.52	6.61	5.96
CGE Effects	1.92	1.78	0.69	0.55	0.52	0.68	-0.13

Exports: Skilled Labour

	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
Direct Effects	1.07	1.08	0.96	0.94	0.96	0.95	0.92
Indirect Effects	2.41	2.54	2.50	2.52	2.64	3.07	2.81

Exports: Professional Labour

	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
Direct Effects	0.29	0.30	0.28	0.28	0.34	0.33	0.36
Indirect Effects	0.72	0.77	0.78	0.84	0.99	1.19	1.05

Exports: Informal Labour

	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
Direct Effects	0.27	0.25	0.19	0.20	0.16	0.15	0.14
Indirect Effects	0.49	0.47	0.40	0.41	0.39	0.41	0.37

NET TRADE

Table 6: Average level in WALC for each region 1990 - 2002

Net Trade: Total Labour

	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
Direct Effects	2.65	2.51	-0.07	-1.55	-0.17	-5.67	-0.67
Indirect Effects	2.20	1.96	-1.41	-1.48	-0.83	-5.42	-2.68
CGE Effects	-0.22	-0.71	-3.20	-2.05	-1.07	-1.89	-0.99

Net Trade: Semi / Unskilled Labour

	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
Direct Effects	2.59	2.61	0.36	-1.23	0.13	-5.38	-0.67
Indirect Effects	2.96	2.91	-0.33	-1.62	-0.05	-6.30	-1.99
CGE Effects	1.14	1.00	-1.52	-1.58	-0.50	-3.69	-1.43

Net Trade: Skilled Labour

	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
Direct Effects	0.05	-0.03	-0.23	-0.21	-0.17	-0.17	0.00
Indirect Effects	-0.44	-0.51	-0.58	0.13	-0.45	0.57	-0.55

Net Trade: Professional Labour

	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
Direct Effects	-0.10	-0.16	-0.19	-0.05	-0.12	0.10	0.02
Indirect Effects	-0.41	-0.52	-0.45	0.07	-0.30	0.53	-0.04

Net Trade: Informal Labour

	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
Direct Effects	0.10	0.10	0.00	-0.06	0.00	-0.21	-0.02
Indirect Effects	0.09	0.08	-0.05	-0.06	-0.03	-0.21	-0.09

Table 8 WALC Net Trade – Rank Positions

Table 8 shows the Net Trade average WALC for each trading bloc over the period. Position 1 indicates the bloc with the highest average WALC and 7 the lowest. For example, if Eastern Europe has the greatest WALC in Total Labour in exports on average over the period (1990 – 2002) compared to other blocs, it will hold position 1 meaning that exports to this bloc contain the highest Total Labour content per R1 million of exports. Shaded areas indicate blocs where net trade is having a positive impact on labour demand

Total Labour (Blocs most conducive to Total labour on average)

	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
WALC Direct Effects	1	2	3 (-)	6 (-)	4 (-)	7 (-)	5 (-)
Indirect Effects	1	2	4 (-)	5 (-)	3 (-)	7 (-)	6 (-)
CGE Effects	1 (-)	2 (-)	7 (-)	6 (-)	4 (-)	5 (-)	3 (-)

Semi-skilled / unskilled labour (Blocs most conducive to this labour type on average)

	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
WALC Direct Effects	2	1	3	6 (-)	4 (-)	7 (-)	5 (-)
Indirect Effects	2	1	3	5 (-)	4 (-)	7 (-)	6 (-)
CGE Effects	1	2	5 (-)	6 (-)	3 (-)	7 (-)	4 (-)

Skilled Labour (Blocs most conducive to this labour type on average)

	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
WALC Direct Effects	1	3 (-)	6 (-)	5 (-)	4 (-)	4 (-)	2

Professional Labour (Blocs most conducive to this labour type on average)

	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
WALC Direct Effects	4 (-)	6 (-)	7 (-)	3 (-)	5 (-)	1	2

Informal Labour (Blocs most conducive to this labour type on average)

	Eastern Europe	European Union	Far East	Middle East	Northern America	SADC	South America
WALC Direct Effects	1	2	3	6 (-)	4 (-)	7 (-)	5 (-)

Table 9: WALC Exports – Rank Positions

Table 9 shows the trading blocs ranked according to average WALC over the period (Position 1 indicates the bloc with the highest average WALC and 7 the lowest).

Total Labour (Blocs most conducive to Total labour on average)

	Eastern Europe	EU	Far East	Middle East	Northern America	SADC	South America
WALC Direct Effects	1	2	4	3	5	6	7
Indirect Effects	1	2	5	4	6	3	7
CGE Effects	3	1	5	6	4	2	7(-)

Semi-skilled / unskilled labour (Blocs most conducive to this labour type on average)

	Eastern Europe	EU	Far East	Middle East	Northern America	SADC	South America
WALC Direct Effects	1	2	4	3	5	6	7
Indirect Effects	1	2	4	3	6	5	7
CGE Effects	1	2	3	5	6	4	7 (-)

Skilled Labour (Blocs most conducive to this labour type on average)

	Eastern Europe	EU	Far East	Middle East	Northern America	SADC	South America
WALC Direct Effects	2	1	3	6	4	5	7

Professional Labour (Blocs most conducive to this labour type on average)

	Eastern Europe	EU	Far East	Middle East	Northern America	SADC	South America
WALC Direct Effects	5	4	7	6	2	1	3

Informal Labour (Blocs most conducive to this labour type on average)

	Eastern Europe	EU	Far East	Middle East	Northern America	SADC	South America
WALC Direct Effects	1	2	4	3	5	6	6