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**THE DETERMINANTS OF INTRA- REGIONAL TRADE
IN SOUTHERN AFRICA**

Thesis Presented for the Degree of the

DOCTOR IN PHILOSOPHY

In the Department of ECONOMICS

UNIVERSITY OF CAPE TOWN

August 1999

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Acknowledgements

PHD's are like wars- the battle is not a one person show. It is a team effort encompassing a number of strategists with different roles and functions, be it intellectual or personal. There are many people who played a role in this thesis that I can hardly begin to list but express my deepest and sincere gratitude to. Naturally there are few that need to be mentioned. Murray Leibbrandt, my supervisor, has been more than the model supervisor. A combination of a fine academic, guiding me consistently with incisive comments, and a refreshing personality, is something that every PHD student could strongly desire. Murray also displayed incredible patience in going through many unrefined rough drafts. I really want to express my deepest gratitude to him. Susan has been both a source of inspiration intellectually and emotionally. My special gratitude to her for going tirelessly through my scripts as well as giving me the love that a PHD victim sorely needs. Trudi who was my collaborator in similar work also played an important role in educating me on some of the technical aspects to the work. I am also indebted to my Personal Assistant, Amanda, on whom my life depends significantly. Not only did she undo my messes in layout and design but consistently pointed to typing errors. Last, but not least Thembi, who has been a research assistant and dealt with the frustrations of consistent data capturing and various other unpleasant tasks.

ABSTRACT

This thesis is anchored in policy developments in the Southern African region, including the imminent conclusion of a Southern Africa free-trade agreement (FTA). The major question addressed in the thesis is whether trade integration is achievable and desirable. It does not take for granted that a FTA will automatically induce more trade in the region. The research focuses primarily on trade potential in Southern Africa but also attempts to define why growth in intra-regional trade is not an important objective in its own right. A major aim of this thesis is to quantify the factors that are likely to influence trade growth in Southern Africa.

The thesis puts forward a case for more attention to be paid to fundamental structural factors that will determine the scope and success of any regional integration initiative. Various methodologies are employed including an applied review of theoretical work, an analysis and appraisal of current Southern African work and, finally, the estimation of a cross-sectional gravity model of trade. This estimation relies on Tobit maximum likelihood procedures, rather than standard OLS methods. The model uses various data sources, primarily from the IMF and the World Bank. The gravity model examines how the reduction of trade-transaction costs, the level of development and the size of an economy influences trade potential amongst countries.

In the thesis, prominence is given to the interpretation of the model and its policy implications. A major finding is that fundamental structural and economic factors such as the transaction costs of trading, the growth paths of economies and changes in per capita income should be the focus of regional integration rather than trade policy in its own right. The empirical results show that intra-regional trade in SADC is not low by international standards. When compared to regions such as SACU or Mercusor, actual South African exports are higher than estimated potential exports. However, the model indicates low trade volumes for combinations of countries in the SADC region. In particular, there is increasing scope of non-SACU countries to increase their exports to South Africa.

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Glossary

Adj	Adjacency
BLNS	Botswana, Lesotho, Namibia and Swaziland
CET	Common External Tariff
c.i.f	cost, insurance and freight
COMESA	The Common Market for Eastern and Southern Africa
CU	Customs Union
FTA	Free Trade Agreement
GSP	General System of Preferences
EU	European Union
F.O.B	Free on board
GATT	General Agreement on Trade and Tariffs
H-O	Heckscher-Ohlin
IMF	International Monetary Fund
M	imports
X	exports
Mer	Mercusor
MVA	Manufacturing Value Added
NAFTA	The North American Free Trade Agreement
NBER	National Bureau of Economic Research
NTB	Non-Tariff Barriers
Pop	Population
SA	South Africa
SACU	Southern African Customs Union
SADC	Southern African Development Community
SSA	Sub-Saharan Africa
TFP	Total Factor Productivity
WTO	World Trade Organisation
RI	Regional Integration Agreements
RIA	Regional Integration Agreements
ROW	Rest of the World
UNCTAD	United Nations Conference on Trade and Development
WB	World Bank

CHAPTER I

INTRODUCTION

The recently proposed free-trade agreement bears testimony to the serious commitment of policy-makers to begin a process of market integration in the region. This stems from a recognition of the economic benefits that regional integration is likely to yield in Southern Africa. However, there are many misconceptions about what economic integration means and the implications that different regional integration strategies hold.

The literature on Southern African integration is fairly extensive and dates back to the early 1960s. This is partly the by-product of various attempts, mostly unsuccessful, at regional integration. There are several reasons why economic integration in Southern Africa is receiving renewed attention. These stem from a co-incidence of an unprecedented change in political circumstances and a proliferation of newly defined economic integration agreements in the rest of the world. Indeed, a major hurdle to any integration efforts in the region, in the past, was South Africa's apartheid policy - seeing that this was the hub country that could play a critical role in economic integration.

Southern African regional integration featured prominently in policy debates because of a milestone decision by the SADC community in 1995 to develop a structured programme of market integration through the FTA. This has generated the need for a great deal of research to guide the process of regional trade liberalisation.

The details of the FTA are currently being worked out. Some consensus has been reached on the time-frame for tariff elimination. An eight-year

phase out period for tariffs is proposed. It is unclear whether the phasing out will be in equal stages on an annual basis or whether the liberalisation will be more uneven. It is equally difficult to predict what the likely economic impact will be on the region as whole or member countries in particular. Although these are important research issues, a more fundamental question as to why countries in the region would want to integrate in the first place, remains unresolved.

A wealth of literature currently exists, which analyses the different institutions in the region. This thesis does not pay much attention to the specifics of these agreements and arrangements. Instead, it aims to contribute to a largely silent debate on the underlying fundamental questions concerning economic integration in the Southern African context. A specific question that it attempts to answer is what does integration mean in the context of asymmetric development and low economic growth?

This thesis focuses on potential trade in Southern Africa. Despite the growing enthusiasm for a FTA in Southern Africa there is very little appreciation about why regional neighbours would want to trade with each other and what the fundamental determinants of trade are likely to be.

Despite the unusual optimism towards a Southern Africa FTA there are some real constraints in the region. Intra-regional trade is often seen to be limited because the region consists of small and relatively unsophisticated economies. The implication being that the FTA may not be a significant event and may not engender the kind of market integration effects expected from policy makers.

More recent literature shows that there is actually more scope for complementarity, amongst developing countries than is generally believed. Moreover, there is growing recognition that in developing regions such as Southern Africa, trade integration may be less important than other factors, such as macro-harmonisation, factor market integration, or policy credibility, which are associated with RI. These factors have given a new lease on life to regional initiatives in developing regions such as Southern Africa.

Should SADC countries open their markets to countries from the same region at a far more accelerated rate than the rate at which they are opening up to the rest of the world? Or should they move directly toward non-discriminatory liberalization? Put differently, why would growth in intra-regional trade (as opposed to extra-regional) trade be more welfare enhancing? Although this thesis does not explicitly look at the welfare implications of trade, it investigates the prospects for trade in a way that provides important signposts as to the likely consequences of specific integration agreements.

In order for trade to be welfare enhancing, in the regional sense, a few conditions need to be met. We will see from Vinerian customs union theory that an important indicator of the welfare outcome is that trade creation exceeds trade diversion.

From a theoretical point of view it is plausible to suggest that as tariffs come down amongst countries, transaction costs such as geography and distance and other NTBs become far more important in determining the direction of trade.

Owing to poor infrastructure in developing regions, one cannot assume that the levels of transaction costs are proportional to distance. For

example, Malawi and Mozambique may be physically closer but the transaction costs of trading may be greater between the two countries than that between Malawi and Germany. In fact, it is safe to say that there is a weak correlation between the two variables in the region. Conceptually, the important point is that in a tariff free world, where geographic/economic costs correspond with distance, there is no doubt that countries, for efficiency reasons, will tend to trade regionally. However, this hypothesis assumes that there is sufficient complementarity for trade amongst the countries. In other words, it would hold if there was any scope for trade creation, which is a function of the structural characteristics and size of the respective economies. This is a central concern of this study. One can simply not assume that a FTA would lead to more trade in SADC. Other critical factors such as size, structure and transaction costs, will determine the outcome of a tariff free SADC.

The thesis consists of five chapters. The first begins with a detailed review of the evolving theoretical work on regional integration. It begins with a discussion of a framework that measures the static effects of regional integration and demonstrates the immutability of this framework. This is followed by a discussion of new and recent thinking on integration. The chapter concludes by showing how these new theories provide useful insights as to how we are able to approach regional issues in Southern Africa but remain limited in providing a framework for systematic empirical work in that very few of these new theories have, in actual fact, been formally tested.

The second chapter is guided, partly, by the first. It critically appraises some of the trade-related literature in the Southern Africa region and attempts to add value to the current work by embarking on a variety of descriptive analyses. It looks at both the structures of the respective

economies as well as their economic behaviour and how this interfaces with trade. The second part looks at trade patterns providing some calculations of intra-regional trade using different data sets. It also analyses current growth in intra-regional trade, presenting some reasons as to why trade has grown and if it is trade creating or trade diverting. The third part of this chapter reviews work estimating both trade potential in the region and the impact that a FTA is likely to have on the SADC region. This part is an important precursor to the gravity model developed later on in the thesis. The discussion of the gravity model is preceded by some discussion of different economic models that exist. The aim is to provide a more holistic perspective on the particular choice of the gravity model, as opposed to a range of many other models. Indeed models differ in data requirements, methodology and more importantly in the issues that they attempt to address.

Naturally the next chapter focuses on the gravity model. The aim is to develop some norm or benchmark to assess trade trends in SADC. It begins with some explanation of the model justifying both the choice and relevance of the model. This is followed by a detailed empirical review of the application of the model in various regions.

The ensuing chapter presents the gravity model and applies it to Southern Africa. It consists of the model results as well as a detailed interpretation of the results. It also compares the results to other applications. What the gravity model shows is that factors of a more fundamental nature, such as market size, distance, common borders and similar languages are more important determinants of intra-regional trade than are institutional factors such as membership of a regional integration agreement, for example. Any attempt to look at factors that either encourage or discourage regional integration using the gravity model will have important policy relevance for the Southern African

region. The second part of this chapter compares actual trade to potential trade amongst pairs of Southern African countries. It will test the hypothesis, based on preliminary evidence, that trade potential between South Africa as the hub economy and the rest of SADC is great, while trade potential amongst the 'spoke' economies still seems small. However, current trade patterns in SADC may not be entirely a reflection of economic and physical characteristics of these countries but also a range of policy considerations from political incompatibility to country-pair specific trade arrangements.

The concluding chapter will both summarise and evaluate the overall findings of the thesis. It will put specific emphasis on how the results of the gravity model compare with other models reviewed in earlier chapters. The chapter will end with suggestions for further research.

CHAPTER II

THEORETICAL DEVELOPMENTS IN REGIONAL INTEGRATION THEORY AND MEASUREMENT IMPLICATIONS

1 INTRODUCTION

The aim of this chapter is to look critically at the broad literature on regional integration paying specific attention to more recent theoretical contributions in respect of the more dynamic considerations such as location effects, institutional effects and growth effects. It pays particular attention to some of the methodological difficulties that economists face in dealing with these new approaches. It shows how these new theoretical developments, whilst providing us with new insights into a range of effects associated with regional integration, leave us to draw very tentative conclusions both in measurement and policy terms.

The basic argument presented in this chapter is that despite our long and important journey to the new regionalism – there is still a strong argument for revisiting in some quantifiable way, what the real scope for trade creation in the region in Southern Africa is. This scope is closely related to the fundamental structure and behavior of the SADC member economies. In addition, this chapter shows that regional integration could have other benefits such as institutional gains, policy credibility and long term growth effects. It shows that these non-traditional dynamic effects represent an important theoretical advancement in the way we think about both the prospects and effects of integration. However, these non-traditional dynamic effects are difficult to apply empirically, specifically in the Southern African context. This chapter is not intended to be a just a theoretical review. It's main aim is to provide the essence of varied theoretical approaches and pay specific attention to the practical and empirical applications of these

approaches. It provides a broad coverage of the range of work on RI that has blossomed specifically in the last ten years.

The chapter begins with an overview of the changing perspectives of regional integration. It then analysis traditional approaches to integration.

Notwithstanding the limitations of these approaches, the traditional concepts remain the backbone of integration theory. New developments in regional integration are to a large extent derived from these traditional approaches. This analysis is then followed by a critical survey of the new literature, which has far-reaching implications for regional integration initiatives. It ends with remarks on the relevance of these new developments to the overall thrust of this thesis. That is, to assess the potential for intra-regional trade in Southern Africa based on certain structural norms or characteristics.

2. FROM REGIONAL INTEGRATION TO THE NEW REGIONALISM

There are various types of trade agreements in the world today that extend beyond 'most-favoured nation status' under the GATT. At one end of the continuum is a preferential trade arrangement that is the most basic type of agreement involving minimum integration. At the other extreme is an economic union that encompasses the far-reaching integration of countries beyond trade, capital and labour flows, to the harmonisation of economic policies. Between these two extremes lie the free-trade agreement (FTA), a customs union and the common market. These different agreements imply varied levels of integration. The FTA and a custom union are generally limited to trade elements.¹ The common market, on other hand, implies deeper integration, specifically the harmonisation of industrial policy and the integration of labour and capital markets (Baldwin, 1994).

¹ A FTA involves countries that have a differential external tariff to the regional tariff while a customs union consist of a common external tariff amongst members.

Despite the second best nature of regional integration there is now growing consensus amongst economists that some initiatives are best carried out at the regional level allowing a small subset of countries to integrate beyond trade and in the process derive higher welfare benefits (Lawrence, 1997).

The roots of the new regionalism can be attributed to what was then seen as the impending failure of the Uruguay Round, demonstration effects in parts of the world and the end of the cold war. Since the late 1980s, there have been many attempts at forming new integration agreements, specifically between developed and developing countries such as the NAFTA,³ the EU agreements with the Eastern European countries and a range of other agreements.⁴

The notion that regionalism grew in response to what was perceived as the imminent collapse of the Uruguay Round negotiations, has been disputed by some authors. For example, Baldwin (1997:26-27) argues that it is factually incorrect to say that politicians prefer regional liberalisation to multilateral liberalisation because regional initiatives are less difficult politically. Many of the regional integration agreements predate what was then the failure of the Uruguay Round to reach consensus on a number of issues. He states that there are a range of idiosyncratic shocks that produced new regional initiatives and trigger multiplier effects which resulted in membership requests from countries that were previously happy to be non-members. The central thrust of his argument is that this domino effect, which consists of a process where a non-member of an integration agreement, such as a firm exporting, begins to become concerned at the cost of non-membership and then triggers a process of firms applying to be part of an agreement.

The new regionalism goes far beyond the traditional approach, both in defining the range of motivations as to why countries integrate, as well as

³ See appendix 1 for an overview of some international agreements.

⁴ Regionalism does not only refer to countries contiguous to each other.

the range of dynamic effects it may engender. Given this, the methodological challenges that it imposes on economists are rather daunting. The important point to make, at this stage, is that the new regionalism has given a new lease of life to theoretical and empirical reasons as to why regional integration can in certain instances produce more superior outcomes for the welfare of member countries than normal unilateral liberalisation.

3. STATIC EFFECTS

As mentioned previously, theoretical analyses on the effects of regional integration go back to the 1950s. In a sense, regional integration theory was built on the back of trade theory. The principal question that trade theorists posed was what motivated countries to trade with each other? Beginning with Ricardian concepts of relative and comparative advantage, a major finding was that for efficiency reasons, countries would trade even if they had an absolute comparative advantage in a two-country, two-product model. In other words if one of the two countries has a relative comparative advantage in both products over the other country it would still have an interest in trading to maximise domestic allocation efficiency.

The main source of Ricardian trade is differences in technology between two countries. The Heckscher-Ohlin (H-O) theories of trade are based on a two commodity, two factor model (labour and capital which are mobile between sectors), with perfect competition in product and factor markets and identical production functions of similar technologies. The source of trade is the difference in factor-endowments between countries.⁵

The theory of customs unions was less concerned about why countries traded but focused more on whether preferential liberalisation would have positive welfare effects. In particular, it was concerned with how preferential reduction of tariffs influenced production and consumption.

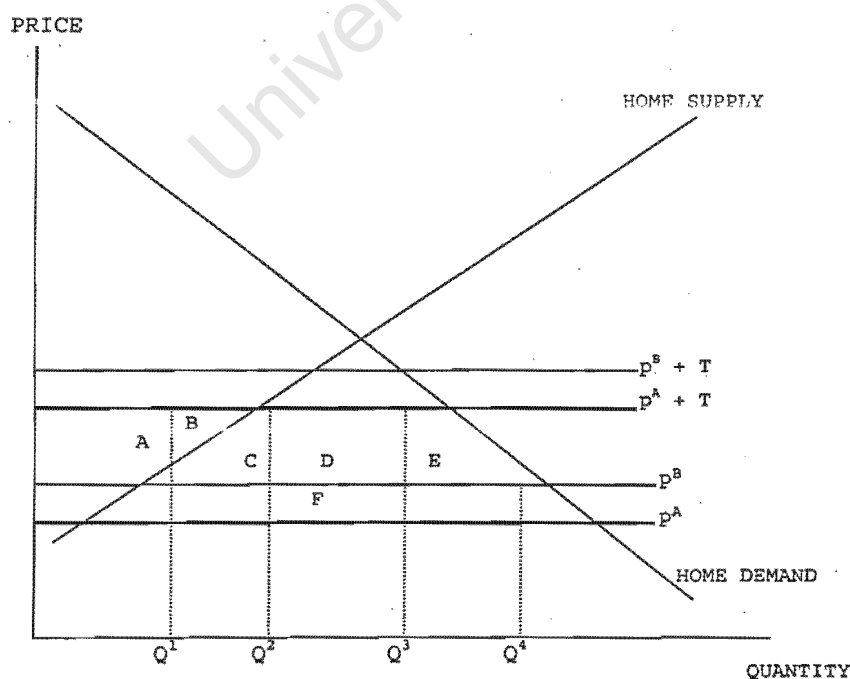
⁵ For a detailed exposition of the analytics behind these approaches see Krugman and Obstfeld, 1994.

3.1 Production effects

Viner (1950) distinguished between two effects when a group of countries enter into a customs union – trade creation and trade diversion. The former refers to the substitution of imports of lower-cost goods produced by a country's partner for its own domestic products. In this scenario trade between partner countries expands in accordance with international comparative advantage (Srinivasan et al, 55:1993).

Trade diversion, on the other hand, causes a shift in imports from the least-cost exporters (a third country outside of the integration agreement) to the more expensive product from a member within the customs union. These two concepts were the pre-occupation of most economists working on integration in the 1950s and 1960s. It can be described as a process of how trade between countries expands as a result of the preferential treatment given to imports from within the region as compared to those from the rest of the world.

Figure 2.1: Trade Creation and Trade Diversion



The allocation and welfare effects can clearly be seen in figure 1.

A common tariff is imposed on both country A and B where naturally all imports would come from country A since it is more competitive than B. If however, the home country signs a FTA with country B, the discriminatory tariff changes the relative competitiveness of goods from A and B. Goods from country B cost $P(b)$ while goods from A still has the tariff at $P(a) + T$. The trade creation effect refers to a case where some high cost home production is replaced by lower cost imports. The trade diversion effects refer to the case where imports from A are entirely replaced by imports from B. In terms of consumption effects, consumption rises to Q^4 (Baldwin, 1994:31-2).

The major policy contribution of the Vinerian framework was that it enabled economists to evaluate the effects of regional arrangements, as distinct from the effects of unilateral trade liberalisation, since a CU based on the traditional theory of comparative advantage of Ricardo or H-O was simply seen as positive on the grounds that free-trade maximised welfare while the imposition of tariffs reduced it. The logic behind this is that the creation of a CU involves the elimination of tariffs and is therefore a step towards free trade and that it increases welfare even though it may not maximise it (Hine, 1994: 236). Viner, on the other hand, provided a more nuanced analysis of this. The concept of trade diversion, in particular, introduced welfare-losses to preferential agreements for the first time.

The policy implications of Viner's contribution were even more profound. It gave countries a rationale to liberalise preferentially and that this could produce positive welfare effects on condition that trade creation effects exceeded trade diversion effects.

3.2 Production and consumption effects

A further nuance to analysing the effects of trade diversion and trade creation was the view that trade creation and trade diversion could also have consumption effects and not only production effects. While Viner focused specifically on production and assumed a perfectly inelastic demand function, Meade (1957) and Lipsey (1960) focused on both the production and consumption side. They argued that consumption gains were a critical component in measuring the welfare effects of a customs union. These gains could be incorporated by dropping the assumption of the perfectly inelastic demand function. Demand then increases as a result of lower cost goods from a member country, relative to domestic ones. What this implied was that if trade diversion exceeded trade creation, this could be welfare enhancing if the consumption gains exceeded the terms of trade losses.

The basic rationale behind the notion that a trade diverting customs union could enhance welfare stemmed from the view that relative prices will tend to move closer to their international values than in the pre-union situation (Lyarkurwa et al, 1997:165). However, despite the welfare gains induced by the effects of lowering consumer or domestic prices there is still concern that growth in intra-regional trade, induced by trade diversion, is counter to comparative advantage from a global point of view (Srinivasin, 1993:55).

The welfare measurement of trade creation and trade diversion is further complicated by tariff revenue effects that are quite critical to the overall revenue generation of developing countries. There could easily be a case where the benefits of trade creation for a single country can be outweighed by the losses of tariff revenue on the pre-RIA volume of imports from the partner country, i.e. by returning to partner producers the tariffs on those imports purchased from them even in the absence of preferences. Thus ultimately simple creation/diversion exercises are indicative rather definitive (Winters, 1997:9).

3.3 Estimating Trade Creation and Diversion

On a-priori theoretical grounds it is easy to predict under what circumstances, trade creation would exceed trade diversion. These are as follows:

- in the pre-integration stage the economies of the member countries are competitive and potentially complementary.
- the integration area is large in economic size.
- pre-integration trade is relatively high.
- the post union protection is low compared with pre-union level or there is low common external protection.
- supply and demand elasticities are relatively high.
- differences in unit costs per industry are high.
- low transportation costs among members or close geographical proximity. (see Ebbbers, 1995:3 & Sapir, 1992:1498).

The calculation of trade creation and trade diversion effects for a single country is also fairly straightforward. Trade creation simply depends on the following:

- The current volume of imports from the potential member country
- The elasticity of import demand which simply refers to the percentage change in the demand for imports when the price of imports on the domestic market increases by 1%
- The change in the tariff rate.

The calculation of trade creation is straightforward. The equation below shows that trade creation is calculated by multiplying the elasticity of import

demand to the value of imports and this is multiplied by the percentage change in the relative price (dp/p) brought about by a change in tariff.

$$TC = (E_M)(X_m) \frac{dP}{P}$$

E_m - is the price elasticity of import demand of country E

X_m - is the value of imports of trading partner

dp/p - relative price change

The calculation of trade diversion is more complicated in the sense that it involves the introduction of an added variable - the elasticity of substitution between products. More specifically, it entails the elasticity of substitution between imports from different sources - a member country in a trade agreement or a customs union and a third country outside the agreement.⁶

Trade diversion (TD) can be estimated as:

$$TD = TC \cdot E_s$$

Where E_s is the elasticity of substitution between goods of the two sources.

As much as these measurements are fairly straightforward in providing useful first round effects of trade creation and trade diversion, the data requirements for inserting the right elasticity estimates can be tricky particularly in developing regions such as Southern Africa (see Gravity Chapter for a further discussion on this). Needless to say the results would be fairly sensitive to elasticity estimates. For example, if the elasticity of supply is high, production within the union will rise as a result of the increased demand. If the elasticities (of demand) in the member countries are high, consumption will increase significantly as a result of reduced trade barriers (Blomqvist et al, 1993:52).

The problem with getting reasonable elasticities is that it requires reliable time series data to be able to estimate these parameters econometrically. Alternatively, an intimate qualitative knowledge of the productive sectors is needed. Many of these calculations assume perfect supply elasticities. However, in many cases, particularly developing countries, there is reason to believe that countries have a low export supply elasticity. Developing countries, in general, face supply-side bottlenecks specifically for non-traditional exports. It is therefore important in these cases to introduce more realistic supply elasticity estimates into the equations.

Given these problems, a broader-brush approach to estimating trade creation and diversion is to relate imports not to consumption or expenditure by commodity but to national income or GDP. Balassa calculated the ex-post income elasticity of demand as the ratio of imports from a particular source to that country's GNP, and constructed an anti-monde⁷ by assuming that the pre-integration elasticities would have continued into the post-integration period (Hine, 1994).

By comparing these hypothetical elasticities with the observed elasticities Balassa was able to identify an integration effect. These changes in elasticities were interpreted as follows: firstly, an increase in the income elasticities of demand for imports from member countries implies gross trade creation, since this consists of an increase in intra-regional trade because of a switch from foreign suppliers or substitution of domestic suppliers; secondly increased elasticity from all sources implies trade creation since this points to a shift from domestic suppliers to member country suppliers; finally decreased elasticities from non-area sources implies trade diversion (Hine, 1994:255 and Ebberts, 1995:7).

⁶ For more details on the calculation of trade diversion and trade creation see Teljeur and Jachia (1998).

⁷ Anti-monde refers to a counter-factual scenario (Winters, 1997).

Balassa's approach is a practical way of estimating trade creation and diversion but has limitations in the sense that an aggregate elasticity is used to determine whether a customs unions as a whole has led to greater diversion or creation. It is thus not suited to estimating trade creation or diversion at a dis-aggregated product by product level. As mentioned earlier, the other snag in his approach is that it requires time series data with a sufficient number of observations for both the pre-integration period and the post integration period. Empirically, Balassa's approach may only be valid for the EU case that has both a long history of pre-integration and post-integration trade.

The major constraint of the Vinerian approach is that it is static and uses a partial equilibrium framework. Static effects lead to allocation effects or inter-sectoral specialisation effects where most benefits were considered a once-off gain as a consequence of a reduction of trade costs. Or put differently, it can be described as a once-and-for all reallocation of an existing stock of capital, labour and other resources. Moreover inputs of factors of production, the state of technical knowledge, tastes and forms of economic organisation are all treated as constant or autonomous variables.

Further constraints in Viner's approach are that trade within each country is assumed to be perfectly competitive with no scope to reap economies of scale. In addition, problems of adjustment induced by a customs union are disregarded. These assumptions are likely to underestimate both the positive static effects as well as the adjustment effects of integration.

Not surprisingly then, empirical work done on the EU, based on a traditional analysis of static effects with assumptions of constant returns to scale and perfect competition were bound to produce insignificant gains from integration. For example, according to Balassa (1975) tariff reduction in the EU community in the 1960s would produce net gains to the equivalent of under 1% of the GDP of the affected region. According to Flam (1992)

another reason why empirical work on European integration produced insignificant gains was because it hinged on the assumption that the source of gains lay in the increased exploitation of comparative advantage by virtue of factor endowment differences or technology differences. On the contrary intra-Community trade, as we shall see later on, was driven more by product differentiation and economies of scale.

Clearly trade creation and trade diversion effects provide a useful way of assessing the overall effects of the free trade agreements. The major attraction of this approach is that it relies on limited data and is easily measurable. One of the more serious concerns, however, is that it has very little to say on what is most relevant to regional integration - that is welfare. It can, however, provide some intuitive guidelines as to whether a trade agreement is welfare improving or not. In other words, the level and extent of trade creation is positively correlated with the resultant change in welfare in the way that diversion is negatively correlated (see Lyakurwa et al, 1997:166). A more profound analysis of the welfare implications of regional integration requires both more elaborate micro-data and analytical techniques, incorporating general equilibrium approaches or dynamic effects, which are discussed in more detail in later chapters.

Although a major focus of this thesis is an assessment of the potential for trade creation amongst Southern African countries, it will not employ the Vinerian approach. For one, despite its low data demands, it requires data that is not easily available for the Southern African region. But more importantly, this approach really focuses on the impact that tariff liberalisation has on allocation of resources in member countries.

Resource allocation is an important concern but the aim here instead is to evaluate whether there is scope for increasing trade amongst regional partners in Southern Africa. Rather than evaluating existing distortions such as the impact of a removal of a preferential tariff on price changes and

how this in turn effects trade creation or diversion, a model is employed that, in a sense, abstracts from the policy distortions and focuses on the fundamental structure of the economies.

The main reason for appraising the Viner approach is that ultimately it complements the approach taken in this thesis. It is important to think in a Vinerian sense of whether trade will increase or decrease but it is also important to extend the concept by linking it to the structure, size and growth of the trading partners.

4 DYNAMIC EFFECTS

Since the early 1980s growing attention has been paid to dynamic effects in trade and integration (Baldwin, 1995 and Lawrence, 1997). Unlike static effects, dynamic effects go beyond the analysis of a simple change in the relative prices induced by a reduction or a removal of tariffs. They are more long lasting and in some ways more overwhelming than statics. There are a range of dynamic effects that could be simply categorised as traditional dynamic effects and non-traditional dynamic effects.

Typical traditional dynamic effects of integration refer to economies of scale arising from large markets, increased competition that enhances economic efficiency and the possibility of larger groups having positive effects on the terms of trade. Allowing for imperfect competition and increasing returns to scale introduces a number of new channels through which trade policy changes can affect an economy.

There are several ways in which non-traditional dynamic effects differ from traditional ones. At least in the realm of regional integration theory, as opposed to trade, this is partly motivated by greater efficiencies that come not only through tariffs but a reduction in overall trade costs encompassing administrative efficiency, reduction of physical, technical and fiscal barriers

to integration, and the costs of other non-tariff barriers. This along with freer movement of factors of production has the potential to create a range of effects such as location effects, capital formation and growth effects, institutional effects and others. The following section provides a review of this new literature and makes some assessment as to how useful this is in the context of applied empirical work on regional integration. It begins with a brief review of traditional dynamic effects and then moves on to a more lengthy exposition of the non-traditional ones.

4.1 Traditional Dynamic Gains: Economies of Scale and Pro-Competitive Effects.

Dynamic gains from trade liberalisation go beyond factor endowments as a cause for trade and pay specific attention to gains from trade based on scale economies and product differentiation. Such dynamic gains are referred to as traditional in that they are not dynamic in the inter-temporal sense of the word, tracking the path of adjustment from one equilibrium to another. These are essentially static models, which assume imperfect competition where additional gains from trade may result from increasing returns to scale, as firms realise internal scale economies and from increased product and input variety for consumers and producers respectively (Fancois et al, 1997:365).

The inclusion of scale economies in the modern static theory of customs unions allows one to move away from the restrictive trade creation and diversion framework. Under conditions of imperfect competition, access to cheaper goods do not take place through the traditional trade creation effect (not from a movement to a cheaper source of supply elsewhere) but from a cheapening of an existing domestic source of supply (Robson, 1998:44). The production effect-the original amount of production sold domestically- is now available at a lower domestic price. The consumption effect is that at a

lower price, an extra amount is purchased by which consumer surplus results (Robson, 1998:44-5).

Linked closely to scale effects are possible pro-competitive effects. Regional integration agreements could successfully erode the market power of dominant firms in member countries through encouraging market entry of competing firms from other member countries (De Rosa, 1998:42).

An important aspect of the imperfect competition approach is the way it changes the degree of competition facing firms. Price depressing effects are the only thing that distinguishes imperfectly competitive firms from perfectly competitive ones (Baldwin, 1998:6-13).

Clearly then, relative to analysis based on constant returns to scale the introduction of imperfect competition and increasing returns to scale could provide a more accurate estimation of the welfare effects of regional integration agreements. There are however, difficulties in using an increasing returns approach.

Under conditions of perfect competition, it is simply not necessary to take firms into consideration since prices are given at the point where they equal marginal cost. Hence the entire supply side of the economy was reduced to the supply curve (Baldwin, 1998:6.1). The implications of using an imperfect competition approach are several – firstly, they require a closer understanding of the nature of products (are they homogenous or heterogeneous) and consequently are these perfect or imperfect substitutes? In the case of import competition from a homogenous product typically a domestic monopolist will restrain a sale of a good that has price depressing effects leading to inefficient pricing (price is greater than marginal cost). Indeed under these conditions import competition would destroy the monopolist's market power.⁸

⁸ The assumption is that consumers have unlimited access to imports at world prices.

Secondly, more detailed knowledge of demand and supply conditions in the integrating countries is needed. More microanalysis is needed of specific sectors and firms, their level of capacity utilisation and export orientation. This kind of information is necessary to determine whether firms are supply or demand constrained in the region and whether an integrated market will result in a reduction in firms' average costs.

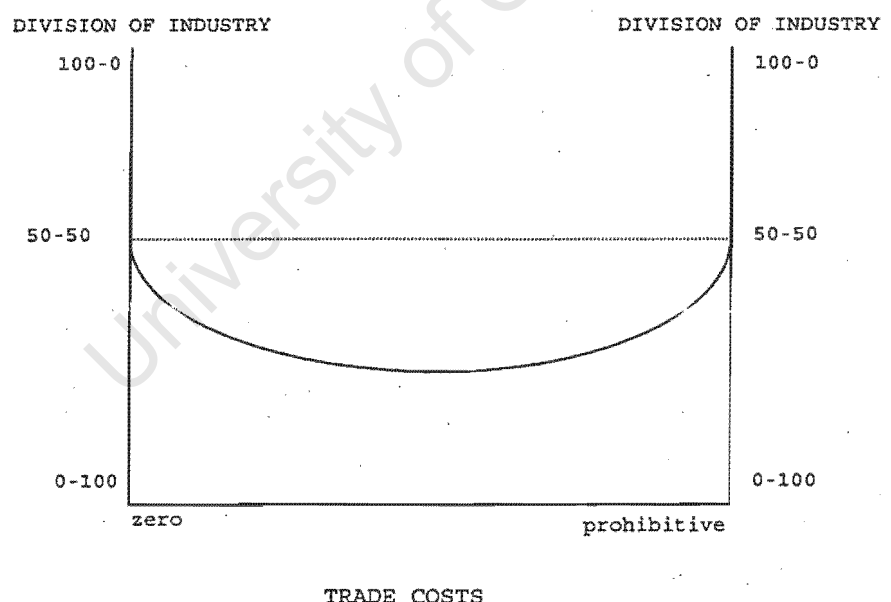
Data on export orientation is important in order to distinguish the benefits from economies of scale arising from extra-regional exports, as opposed, to intra-regional exports. Indeed, regional liberalisation may have specific significance for scale effects if there are products that are tradable or exportable on the regional market only. For example, South Africa, as we shall see in the next chapter, is competitive, for whatever reason, in certain products in the regional market only and not on the international market. In these circumstances, the economies of scale argument may feature more prominently in regional integration than in unilateral liberalisation.

4.2 Trade Arrangements and Location Effects

The importance of geographical considerations in economics and specifically international trade has created new set of insights about how regional integration can affect the locational decisions of firms. The recognition of the importance of transaction costs to trading features prominently in recent economic work that looks at the link between trade arrangements and location effects (Krugman, 1991 and Lyarkurwa, 1997). More specifically, it examines the extent to which regional integration affects the locational decisions of firms. The thrust of this new work is that increasing returns to scale have a pervasive influence on the economy and this gives a decisive role to history in determining the geography of real economies (Krugman, 1991:10). Increasing returns are also quite critical to growth theory (this will be examined in more detail later on).

Given below is the u-shaped relationship of trade costs and concentration. What this implies is that if one takes two identical countries under two extreme cases; on the left hand side a country with zero trade costs and on the right hand side a country with prohibitive trade costs. In cases where there are zero trade costs firms would tend to spread out in search of low cost immobile factors such as land. However, if trade costs increase this would lead to an increase in concentration as firms would have more of an incentive to locate where larger markets exist. Hence the u-shape – trade costs increase from zero and there is a movement from the 50/50 concentration. The opposite circular process takes place at the other end of the diagram. Because of high prohibitive costs firms are fairly decentralised but as these costs come down firms search for larger markets leading to greater concentration.

Figure 2.2: Trade and Geography



Source: Baldwin, 1994

In practical terms what this implies is that the link between trade costs and industry location is 'not simple and monotonic' (Baldwin, 1994:48). At some point firms decisions are informed by the relative price differences in factor mobility (wage costs) and trade costs. As trade costs are reduced firms become more foot-loose and more sensitive to differences in international prices. It is this that drives convergence in factor costs.

The schematic diagram is crude and there are indeed far more complex dimensions to modeling the link between trade and geography. As Krugman (1993:pp 101-105) shows, the main challenge is incorporating market structure into the model. The model typically consists of manufactured goods. Manufactures consists of a number of differentiated products. These products are subject to economies of scale with a monopolistically competitive market structure. Indeed there are important demand parameters and supply inputs that have to also be incorporated into the model. Owing to increasing returns, the pricing structure of the model will have to include a constant markup over marginal cost.

The thrust of the new trade and geography literature is that much broader forces affect the economic geography of firms than was recognised in earlier work that looked specifically at agglomeration factors such as labour market pooling, technological spillovers and the supply of intermediate goods. This framework explains the reasons behind smaller economic concentrations (Baldwin, 1996).

Trade policy, by reducing trade costs, could influence more dispersion of firms than under conditions where trade costs are high. Three important variables that explain economic concentration are increasing returns, transportation costs and demand for goods. The locational decisions of firms depend on changes in the relative costs of these variables. In other words, locational decisions depend on a complicated cost analysis of increasing returns, level of trade costs and the extent of capital and labour

mobility. The assumption is that reduction of trade costs or transactions costs could induce location effects specifically for firms locating in regions that otherwise would have not been feasible had these costs not come down. This analytical framework has specific relevance for regional integration initiatives, as one of the main objectives is to reduce overall trade costs amongst firms in the member countries.

As we can see a mix of these factors will determine whether firms concentrate in a single location or a small number of locations or even fail to concentrate at all. Whether it is the extent to which economies of scale can be exploited, the desire of firms to locate closer to a larger market, the desire of workers to have access to goods produced by other workers or the desire to locate closer to the peripheral markets and save on transport costs (see Lyarkurwa, 1997:171), no agreed empirical framework has been generated to incorporate all these factors into a systematic formal analysis.

One of the useful ways of quantifying the links between trade and spatial economics is a simple gravity model, which looks at the volume of transactions between two cities as a function of distance and the size of the population. Although it is difficult, with this approach, to model in an explicit way the locational determinants of firms, it does give some idea of how basic variables such as size of the economy or the purchasing power and other factors influence trade potential. In other words, it is indicative.

In summary, despite the elegance of this framework, these economic geography models are somewhat stylised in their assumptions and not yet empirically testable. However, some of the insights from this approach provide a useful way to think through factors influencing firm location in Southern Africa. For example, it could inform the way analysts think about the reasons behind South African firms locating in other parts of the SADC region.

4.3 Regional Integration and Factor Mobility (Capital)

A discussion of the link between trade and investment can be seen from different perspectives. The first is whether regional integration improves the investment climate and encourages extra-regional FDI inflows. To the extent that there are increasing returns to scale, the creation of a larger integrated market in conjunction with an increase in competition will lower unit production costs and increase the attractiveness of establishing productive capacity within the region. Similarly, if intra-area liberalisation has positive effects on the growth of per capita incomes, it will further increase the incentive for inward foreign direct investment, to the extent that this leads firms to anticipate market growth and perhaps further reductions in unit costs (WTO, 1995:46 and Robson, 1994:9). The process of reducing the cost of market fragmentation would play an important role in encouraging multinationals to locate in the Southern African market, for example.

Another way of looking at the impact of integration on production is via the effect of regional integration on cross border direct investment and investment creation and diversion. Investment creation refers to the expansion of FDI that is generated by trade diversion where firms that locate in third countries will have an incentive to locate to new production facilities in member countries that would otherwise be cut off by tariffs (or NTBs). Investment diversion is closely linked to trade creation where it creates an opportunity for firms to reorganise production within the common market to take advantage of scale economies and specialisation (Robson, 1998:114).

Baldwin et al (1995) attempt to look at the investment creation and investment diversion effects of regional integration. They come to the tentative conclusion that the EU may have had investment creation effects for countries such as Spain and Portugal that joined the union in the mid-1980s. Fine and Yeo (1997:443), argue, however, that increased FDI could not be attributed to the lowering of trade barriers, since Spain and Portugal

had enjoyed duty free access to the EU since 1976. Instead, the growth in FDI is attributed instead to more stable economic policies and the adoption of investment codes, which encouraged capital inflows. In other words, accession to the EU induced investment in Spain and Portugal, not because of a large captive market, instead it gave credibility to the policy regimes of these countries.

It is clear that in a world of increasing capital and labour mobility, attempts to look at trade effects under assumptions of no cross border movement in factor flows is not terribly useful. However, linking RTAs to FDI poses serious methodological difficulties. It is reasonable to assume that RTAs provide conditions for a large captive market and therefore induce more FDI than would otherwise be the case. A larger market is only one factor amongst a range of others that determine investment decisions. As Khan(1996) put it, FDI has proved notoriously difficult to explain let alone model in an acceptable fashion. The problem stems from the fact that there is a range of other more important factors such as labour productivity, infrastructure and policy uncertainty that determine investment.

The importance of FDI inflows to regional agreements is not sufficiently persuasive for countries to base their decisions on when entering a regional arrangement. However, this does not mean that one cannot anticipate the possibility of FDI inflows as a result of integration. Increasing FDI may well be a by-product of increasing integration in developing regions such as Southern Africa.

4.4 Institutional Effects and Gains from Harmonisation

The more recent theoretical approaches to integration began identifying a range of important non-trade motives for economic integration. In other words, these agreements go beyond trade and free mobility of factors of production to the imposition of a set of reciprocal commitments and

obligations (Henrekson, 1996). This has particular implications for developing countries where lack of trade complementarity was seen as a major impediment to regional integration. A growing literature in the 1990s began examining in a systematic way the role that regional integration can play in assisting regions bedevilled with policy uncertainty or lack of credibility (Fernandez, 1997 and Francois, 1997).

The nature of uncertainty and the likelihood of policy reversals were seen as a key deterrent to investment prospects in many developing countries. There is a growing amount of empirical literature showing that policy uncertainty can be an important deterrent to potential investment. Unless investors are fully convinced that the reforms are permanent, their perceptions about the probability that reforms may be reversed will become a key determinant of the investment response (World Bank, 1995). This fundamental problem is often referred to as time-inconsistent policies (Fernandez, 1997). Lying at the heart of the uncertainty was the erratic nature of trade liberalisation of countries. A classical example, widely cited in the literature, is the experience of Mexico in the 1980s. Its decision to participate in the FTA with the US and Mexico was driven primarily by the need to 'lock in' its policies with those of a credible neighbour (Srinivasan 1994).

4.4.1 *The Effectiveness of Locking -In Agreements*

But how exactly does regional integration (as opposed to multilateral integration) bind countries? Firstly these agreements specifically apply to integration between small and large countries at different levels of development. The important question is whether these regional agreements are more effective, than multilateral ones, in binding policies. For example, why should an integration agreement more effectively undermine the interests of politically influential lobby groups opposing liberalisation than unilateral liberalisation?

There are several reasons why the issue of external bindings has been given more attention within the framework of regional integration as opposed to multilateral liberalisation. Firstly, in most cases, trade liberalisation schedules are far more dramatic and radical under regional agreements than under unilateral liberalisation. Secondly, there is a tendency for a regional framework to commit beyond trade harmonisation to macro, fiscal and a range of other economic policies. This creates or forces higher levels of commitment by governments to the trade liberalisation process.

Anderson and Snape (1994) list a range of reasons why economic integration agreements have an income-enhancing effect that is proportionally more beneficial to smaller countries than they are to larger ones. Apart from economic benefits such as proportionately greater pro-competitive effects or opportunities to exploit economies of scale, they identify an important institutional effect - 'safe haven' effects of being subjected less to contingent protection (e.g. anti-dumping actions) by being inside a regional integration agreement. The benefits to a smaller country are even greater if it has a relatively inward looking trade regime as well as being 'relatively prone to investment-reducing macro-economic instability and micro-economic reform reversal but becomes more disciplined as a result of joining a RIA' (Anderson and Snape, 1994:8).

The international literature argues that RIA's could assist governments in introducing time consistent policies in the sense that it forces governments to adhere to binding rules. As Fernandez (1997:9) shows that for this hypothesis to be plausible two conditions must be met. Firstly, policies in the absence of a RIA must be time in-consistent. Secondly, the cost of exit from the RIA must be high enough to outweigh the gains from simply abrogating it and returning to the time in-consistent policy. These are important factors to take cognisance of since there is no reason to believe that RIA's are a panacea against time in-consistent policies.

reduction in transaction costs) but also in services through greater capital and labour mobility.

The issue of harmonisation of national economic policies is partly a function of how integrated the regions are. The more integrated countries are, the more vulnerable they are to each other's national economic policies. In the EU, for example where intra-regional trade constitutes close to 70% of total trade, member countries have an incentive to converge as they are vulnerable to fluctuations in each other's economies. In developing regions such as Southern Africa, for example, intra-regional trade is below 10% and countries are not as vulnerable to each other's macro-economic behavior.

The difficulty of making judgements of how beneficial harmonisation would be to potential countries stems from an inconclusive literature about the sequencing of integration efforts. Can developing countries with low levels of trade integration realistically benefit from harmonisation policies? There is no definitive answer.

In view of the fact that a regional arrangement between a developed and developing countries could enhance the credibility of the latter some would argue that North-South arrangements provide more benefits for participating (especially developing) countries because this arrangement will engender more positive dynamic effects than will be the case in South-South arrangements (Bouzas, 1995:28). However, while the institutional and harmonisation literature is instructive it remains tentative and difficult to both quantify and generalise.

4.5 Is Economic Integration Growth Inducing?

It is no surprise that an important pre-occupation of economists is the extent to which trade liberalisation can enhance the growth prospects of a country. This section looks cursorily at growth theory, its evolution and

assesses if there is a systematic relationship between growth and regional integration. The link between trade and growth gained prominence in the 1980s with the introduction of endogenous growth models (Romer, 1986).

To understand the link between trade, or regional integration, and growth requires some understanding of growth theory. The standard growth theory is based on an aggregate production function (Solow, 1956). A crucial property of the aggregate production function is that there are diminishing returns to the accumulation of capital. Capital accumulation drives growth in the Solow model since factors such as population growth and technical change are exogenous to the model. Moreover, Solow looked at growth in a closed economy where the rate of productivity growth is given. Within this classical growth framework, the key determinant of long run growth is per capita income and the rate at which exogenous technological breakthroughs occur.

Endogenous growth theory differs in fundamental ways from the former. As we can see from Table 1 the assumptions of endogenous growth theory are a closer approximation of reality. The notion of increasing returns to scale and the centrality of human capital and knowledge to growth goes a long way in explaining why there has been a lack of convergence in the world economy. Endogenous growth theory attempts to look more systematically at the determinants of rates of technical progress in comparison to classical theory (Robson 1998).

Table 2.1: Comparison of Growth Models

Classical Growth Theory	Endogenous Growth
Constant Returns to scale	Increasing returns to scale
Diminishing returns to capital	Importance of human capital and knowledge to growth
Exogeneity of labour force, growth rate, savings rates and depreciation	The endogeneity of technology

rate.

Sources: Robson, 1998 and Baldwin 1994

In classical growth theory, owing to diminishing returns, economies retain a steady state growth while in countries where the marginal productivity of capital is greater, these are likely to converge with the high growth countries (controlling for other variables such as savings rates, growth of the labour force). The relaxation of the diminishing returns assumption in endogenous growth theory implies that countries at disparate levels of development will not automatically converge.

4.5.1. Standard growth theory and medium run accumulation

Baldwin (1994) draws on standard growth theory to measure the growth effects of regional integration agreements. More controversial, however, is the impact of trade on growth effects as distinct from other effects. He uses Solow's approach to show how an increase in GDP of 1% (calculated by static effects) will lead to medium run accumulation. He uses a simple aggregate output function which allows an 'easy and transparent estimate of the medium-run dynamic effects.'

Given below is notation of the Solow model (1956) where output is a function of total factor productivity, physical capital and labour-

$$Y = A K^a L^{a-1}$$

Y- is output at time t

A- is the overall productivity parameter

K -capital

L -labour

a and a-1 are the elasticity of output with respect to capital and labour

An upward shift in income to labour could occur because K rises and not due to TFP growth. The latter increases both the ratio of income to labour as well as the ratio of income to capital. Savings respond to income not TFP. The change in income is proportional to a change in capital.

Baldwin (1994) uses the estimates of the static efficiency gains derived from the equation above to measure the dynamic gains. Although crude, it is useful in demonstrating growth effects. The equation below demonstrates how a percentage change in output with the same amount of inputs induces an equal percentage change in total factor productivity (A). The equation shows how static efficiency gains causes an increase in factor productivity that in turn induces capital accumulation effects. TFP causes output growth.

$$\% \Delta GDP = (\% \Delta A) / (1 + \frac{a}{1-a})$$

Baldwin argues that these aggregations are nothing more than an illustration of common wisdom propositions that growth effects may easily be more important than static ones (1994:54). These medium-run effects are grounded firmly in capital accumulation mechanisms highlighted in classical growth theory and are not dependent on the dynamic externalities featured in new growth theory (Fancois et al, 1997:364). The medium run effect is all about how static gains induce changes in investment and savings.

4.5.2 Temporary vs. Permanent Growth Effects

The attempt to look at trade and growth so far was simply based on using static efficiency gains from market integration to measure the dynamic effects. The medium-run effects are different from the long-run effects. An assessment of the importance of trade arrangements to long-run growth or

what is referred to as endogenous or permanent growth is indeed more complex.

The literature distinguishes between permanent and temporary growth effects. In other words, in the case of a temporary growth effect it is reasonable to assume that stronger competition and cost reduction lead to a one-time expansion of output during a period of several years (Flam, 1992:24). Permanent growth effects, on the other hand, refer to the process where integration introduces growth over a more indefinite period and not just for a period of four or five years as is the case in the former. Permanent growth effects are more questionable and exceedingly difficult to quantify.

Because orthodox theory assumes constant returns to scale, the increased rate of growth and output last only over the period during which additional investment is being undertaken. The long-term growth rate is unaffected so long as technology and the savings rate are given. The impact is greater in endogenous growth where any increment in the rate of growth resulting from static efficiency gains would not only be larger but also longer with the strong likelihood that growth can be raised permanently owing to consistent incremental growth in innovation and human capital (Robson, 1998:99).

There are several ways in which trade or regional integration and new growth theory can be linked. Trade affects growth mainly via its effects on investment in human capital, physical capital or knowledge capital (Baldwin, 1994:50). Firstly, Baldwin (1994) shows that the basic link between economic integration and growth is fairly straightforward if integration plays a role in accelerating capital formation or technological innovation. Growth in per capita output requires the accumulation of some factors of production. Consequently, international trade arrangements influence growth by affecting the accumulation of factors. Most accumulation of productive factors is intentional and it is called investment.

Secondly, the notion that integration produces growth effects derives from the simple assumption that trade liberalisation and factor mobility stimulated the rate of innovation (Flam, 1992:25). Thirdly, investment in human capital is encouraged as trade stimulates innovation.

4.5.3 Growth and Trade Re-Visited

The attraction of new growth theory is that it incorporates a more systematic analysis of the micro-foundations of accumulation particularly the private costs and benefits to investing in more capital and skill(human capital) and as a result allows for a wider range of economic channels by which trade affects growth (Baldwin, 1997:63).

Although the development of endogenous growth models has 'permitted considerations of a much wider range of mechanisms through which trade can affect economic performance', the 'exact links between regional integration and dynamic growth effects are not well specified, and it is not uncommon that analyses and empirical estimates of dynamic benefits are considered vague or speculative' (Henrekson et al, 1996:3).

As far as medium run growth is concerned, trade policy effects have not yet been explicitly modelled. There is simply the assumption here that trade liberalisation enhances the efficiency of capital and the results from the static effects are then used in a Solow growth model. In other words medium run growth effects are relatively easy to model in as far as static gains induces changes in savings and investment.

The vehicle through which trade policy allegedly induces growth is through greater openness, which at a crude level is associated with a better utilisation of resources as countries reduce their distortions and become more open externally. One of the serious problems is that the measurement of openness is not clear-cut and a subject of great controversy. Some

economists argue that there is a high correlation between openness and economic growth while others show that empirical evidence has been unable to confirm the independent role for openness in economic growth (UNCTAD, 1998 and Sachs and Warner, 1995).⁹

De Melo, Panagariya and Rodrik(1992) present cross-country regressions of per capita income growth on several explanatory variables including membership in regional trade integration schemes. Their results suggest that EC membership has had no impact on per capita income growth (Sapir, 1992:1501). This model is, however, limited and cannot measure potential investment effects that may be very important to growth effects. Henrekson, Torstensson and Torstensson (1996) on the other hand, also use a cross section regression analysis to show that European integration actually enhances member growth rates. Technology transfer, they argue, is the main mechanism through which EC and EFTA membership affect growth. They are agnostic on investment effects - all the evidence suggests there is likely to be an investment effect - but the investment dummy variable is not as robust as the technology transfer dummy.

It seems clear that the evidence linking regional arrangements and growth effects is weak or indeterminate. In other words, there is no consistent unambiguous link between trade liberalisation and growth. At the empirical level, conflicting results are partly explained by divergent econometric approaches or differences in their treatment of openness (see Winters, 1997). Henrekson et al (1996) themselves argue that a fair evaluation of potential integration effects on long-run growth should examine a time period when the initial resource allocation effects can be expected to have faded and integration has been firmly entrenched.

⁹ See next chapter for a more detailed discussion of openness measurement problems.

The link between growth and openness becomes murkier when attempting to distinguish between liberalisation within the context of a regional integration agreement as opposed to a unilateral liberalisation path.

Does regional integration enhance growth? Or conversely, does economic growth increase the prospects for regional integration? The East Asian¹⁰ case shows that although the former remains a matter of debate, the latter holds true. An interesting counterfactual question is whether East Asian growth would have been even more spectacular if a serious programme of regional integration was pursued as complementary to multilateral liberalisation. One thing is clear, high growth rates occurred in spite of the absence of formal regional integration initiatives. On the other hand, sustained unilateral trade liberalisation strategies created increasing intra-regional trade.

One has to distinguish between two policy processes. The first, is unilateral liberalisation and the second, is bilateral or regional liberalisation. At the end of the day it is liberalisation per se that could produce growth effects. The relevant question is to what extent regional integration induces a process that results in positive effects for the Southern African economies that would otherwise not occur through a process of unilateral liberalisation? This is a difficult question to answer but this study aims to unpack whether there is any logic in SADC member countries pursuing an accelerated process of regional trade liberalisation as opposed to multilateral liberalisation.

In the final analysis, there is general consensus that the accumulation of physical and human capital and technological progress are the principal

¹⁰ East Asia has been different from Western Europe and North America in not having significant regional integration agreements during the past four decades, yet the share of its trade that is intra-regional is growing. Intra-regional trade is at present approximately 40% of all East Asian trade. This is high by developing country standards but modest by comparison with the EU, but is considerably larger than the role played by intra-regional trade in North-America.

causes of economic growth (USITC, 1997). The link between trade and growth is premised on the assumption that trading arrangements change the incentives for factor accumulation and countries' rate of growth and relative factor endowments (Venables and Puga, 1997:2). However, the lack of sufficient micro-research, the ambiguous theoretical and, to some extent, empirical evidence poses particular difficulties in trying to measure long-run growth effects either from trade liberalisation or regional integration (which in fact is a form of trade liberalisation).

5. RE-VISITING TRADE CREATION IN DEVELOPING REGIONS¹¹

The entire discussion so far has invariably assumed that regional integration is likely to be welfare enhancing if there is some scope for trade creation. Winters (1997) argues that what is more important to integration is not so much increasing trade but the improved welfare of member economies. However, it is difficult to conceive of any integration effect that is likely to be welfare enhancing if the potential for trade creation is severely limited. Put differently, trade creation provides a necessary but not a sufficient condition for a successful regional integration initiative. Even in cases where, as the new literature suggests, there may be institutional benefits, these also presume that there is a high propensity for pre-integration trade.

The section consists of two parts. The first provides an analysis of the main reasons why intra-regional trade was severely limited in the past amongst developing countries. It is followed by a second part that looks at some of the theoretical reasons as to why current and future prospects for growth in intra-regional trade amongst developing countries seems far greater.

¹¹ By developing regions I refer to countries within the region that still rely heavily on natural resources for their trade.

5.1 Constraints on Intra-Regional Trade: An Ex post Analysis

In general, intra-regional trade has been low amongst developing countries and fairly high in the developed world specifically the EU. More recently, however, growth in trade in regions such as the Mercusor has significantly increased.

Several reasons have been identified in the past as to why the scope for increasing intra-regional trade in developing regions was low. Firstly supply patterns were often more competitive than complementary in nature. Given the low levels of development in many of these economies the potential for shaping the sectoral structure of the economies towards increased complementarity was not large in the short-run (Langhammer 1992:214). This lack of complementarity can be explained by the overall structure of economies as well as their accompanying policy regimes, which reinforced inward-looking policies. In other words structural elements limited the scope for potential gains since the trade systems of member countries were typically characterised by highly dispersed levels of effective protection, and little intra-regional trade occurring prior to integration. This stemmed from the inward-oriented development strategies by most member countries (De la Tore et al, 1992: 36).

Secondly, developing countries with similar factor endowments offered, by their nature, limited scope for trade creation along the lines of comparative advantage (for which different factor proportions in technology are key); at the same time, their small markets and low per capita incomes were not conducive to significant trade based on scale economies and product differentiation (De la Tore et al, 1992: 36). Moreover, they had very similar export structures with very little scope for exchange, unlike developed country intra-industry trade. Hence, many argue that developing countries would thus be better off exploiting gains from trade based on differences in resource endowments and productive structure - seizing comparative

advantage dynamically at every point in time as they build their human, capital, and technological stocks' (De la Torre et al, 1992: 39).

Thirdly, intra-regional competition was discouraged rather than encouraged. Two major obstacles to liberalisation were the tariff-revenue constraint, directly as a result of the import-substitution strategies, and the skewed distribution of costs and benefits of integration arising from the extreme economic differences among SSA countries (Foroutan, 1993: 254).

The revenue constraint is premised on the argument that the more potential partners trade with each other, the higher the proportion of revenues they derive from such trade and, hence the more difficult it becomes to give it up. However, a preference-induced tariff revenue loss may actually necessitate a further increase in tariffs against the outside world to raise their trade revenue vis-à-vis the rest of the world after integration (Foroutan, 1993:254). SSA countries do not satisfy the conditions for an equitable distribution of net gains since the costs and benefits of regional integration are different for different member countries. Part of the problem is that they have not been able to find a workable and non-distortionary compensation mechanism (Foroutan, 1993:pp 254-60).

There are certainly grounds for revisiting the prospects for increasing trade in developing countries as many of the conditions that constrained trade in the past have changed. For example, both the inward orientation and the revenue constraint as an obstacle to trade integration may be less significant a constraint today partly because many of these countries have embarked on liberalisation programmes and are developing strategies to develop alternate revenue-creation strategies.

New theories of integration as well as serious policy changes in many developing parts of the world has given a new lease of life to intellectual thinking on regional integration theory and its relevance to regions such as

Southern Africa. They have, in a sense, equipped economists with more appropriate tools for assessing integration. Some of the important gains identified in the new literature are more relevant to developing countries' integration initiatives today, specifically some of the institutional gains identified earlier. The question is whether these new theories have given greater theoretical credibility to the case for economic integration in some developing regions where the scope for trade complementarity may still be low?

5.2 Likely Future Trade Patterns

There is the argument that developing countries have more to gain from a multilateral (North-North, North-South, South-South) expansion of trade than from efforts directed at any narrower liberalisation (Greenaway & Milner, 1990:48). Greenaway and Milner, however argued that despite these problems intrinsic to developing countries a case can be made for intra-regional trade expansion based on inter-industry specialisation.¹² However, there is also reason to believe that intra-industry trade will become increasingly important among developing countries with rising per capita income and the growth of manufacturing activity.

Intra-industry trade is related to the exploitation of economies of scale. As more developing countries climb the ladder of industrialisation and gain access to larger global markets, their growing intra-industry specialisation will provide stimulus to more intra-industry trade both North-South and South-South (Greenaway and Milner, 1990:55). There are obvious reasons why intra-industry trade is more beneficial to intra-regional trade. Firstly there is greater potential for trade creation based on tradable differentiated goods. Secondly, intra-industry trade does not create the same magnitude of adjustment costs in comparison with inter-industry trade. There is a general

¹² Their argument is based on the assumption that changing policy conditions and the growing recognition of complementary makes a strong case for integration.

view amongst economists that integration not only leads to greater intra-regional trade but also to greater intra-industry trade.

Intra- industry trade depends upon similarities across countries, while inter-industry trade depends upon differences. Relatively distinct factor endowments produce mainly inter-industry trade, whereas endowment similarities cause trade to be largely intra-industry. Balassa and Beuwns (1987:38) show that the extent of intra-industry trade in developed economies is positively correlated with average income levels, average country size, trade orientation and the existence of common borders. It is negatively correlated with income inequality, inequality in size of country and distance. More interestingly, industry characteristics such as the measure of product differentiation, significant economies of scale and industrial concentration are negatively correlated with intra-industry trade reflecting standardisation (Balassa and Beuwns, 1987:32).

As mentioned before, one of the tangible measures of trade integration is increasing intra-regional trade. However, increasing intra-regional trade as a result of an integration agreement itself may not be welfare enhancing since a large part of trade could be diverted from third country members. The question is can we be more optimistic about welfare optimising growth in intra-regional trade and what does this mean for regional integration initiatives?

There are two lessons that can be gained from the literature. Firstly, there is greater potential for trade complementarity than was believed in the past. There is also evidence to show (see next chapter) that intra-industry trade accounts for an increasing proportion of intra-regional trade, in SADC, for example, although in absolute terms the volume of intra-industry trade is small. There is also a strong link between increasing growth and diversification of the economy and that of intra-industry trade. This implies

that the potential for this pattern of trade is contingent on the growth rates of developing economies.

Secondly, there are many reasons as to why countries may want to consider regional integration agreements even if the prospects of trade integration seem limited. These relate to institutional and other gains identified earlier. However, at the end of the day no integration is likely to succeed if there is no trade creation potential and in this scenario it may make sense for countries to pursue an exclusive unilateral trade liberalisation strategy.

In the final analysis, although there was a general assumption that trade potential in developing countries was limited, there are many factors today that lead to more optimistic conclusions. In other words, with growing trade liberalisation and gradual reduction in intra-regional distortions to trade, developing countries show far greater scope for trade complementarity than in the past and better promise of welfare-enhancing regional growth.

Trade based on both inter-industry or intra-industry patterns could be welfare improving although the adjustment consequences will differ. One of the major exercises of this thesis is to look at the future trade potential of the Southern Africa region. It could be stated a-priori that trade potential will depend on growth factors, the transaction costs to trading, changes in the trade and economic policy regime and other structural factors. The respective importance of these variables will be quantified and appraised on the basis of the Southern Africa case study.

CONCLUSION

The new literature provides a range of novel approaches to understanding the motivation and rationale for economic integration, specifically in developing countries. If there is a lack of complementarity amongst developing countries and the prospects for increasing trade have proved to

complementarity amongst these countries than was previously believed. Although the exclusive objective of using agreements as vehicles to increase intra-regional trade has decreased in prominence in the new literature, many of the dynamic effects outlined are still contingent on whether there is increasing trade.

It is because of both the ubiquitous importance of trade potential and the methodological difficulties of operationalising these new approaches that this thesis will focus on the more fundamental issues underscoring regional integration in Southern Africa. The aim of this chapter was to demonstrate why this thesis focuses overwhelmingly on trade potential rather than some of the new theoretical ideas presented in this chapter. The main lesson that is taken from the new theoretical developments is that the fundamentals of the economy matter most. In other words, one of the most important challenges facing developing regions such as Southern Africa is the need to stimulate high economic growth – factors that act against high growth are the lack of proper incentives for investment, low savings rates and the lack of credible policy reform. If regional integration could play a role in reversing these variables then it certainly may be critical to the growth prospects of the region. Hence the ensuing chapters deal with the more fundamental and structural economic questions. However, occasional reference will also be made to some of the issues raised in the new approaches but it will be descriptive and not driven theoretically.

CHAPTER III

REGIONAL INTEGRATION IN SOUTHERN AFRICA: A LITERATURE REVIEW AND A STATISTICAL ANALYSIS¹

1. INTRODUCTION

Southern Africa 'boasts' a hybrid of overlapping institutional arrangements governing trade patterns in the region. These agreements vary in intensity, country combinations and geographical spread. There is the SACU agreement, which is currently being re-negotiated while the SADC arrangement has now officially introduced a trade protocol made more complicated by the fact that some countries also belong to COMESA.

A critical evaluation of the different types of institutional arrangements is beyond the scope of this thesis. Appendix 2, however, consists of a brief analysis of some of the complexities of the varied institutional agreements in the region. It highlights the differences in scale, geographical and economic coverage of the various arrangements and points to some political economy considerations specifically trade tensions between South Africa and the rest of the region.²

It is safe to say that most agreements in Southern Africa, with the exception of SACU, have, to date, been ineffective. Trade remains overwhelmingly focused towards industrialised countries. Despite this somewhat dismal history of economic integration in Southern Africa,

¹ Where possible the most recent data is used in this chapter. However, in cases where data goes up to 1994 or 1995, this may still be meaningful in the sense that data has not changed dramatically for the current period in US dollar terms. This also applies to the gravity model later on that uses average 1991 to 1994 data.

² In view of the fact that a critical and comprehensive study of the various institutional agreements in SADC is not the main focus of this thesis, an analysis of these agreements is relegated to appendix

there are good reasons for re-visiting the prospects for regional integration in Southern Africa.

Firstly, most countries in the region are significantly more liberalised today than they were two decades ago. Secondly, South Africa, as a fairly diversified and large economy, by developing country standards, has created more promising prospects for regional integration. Finally, changes in domestic political conditions have created an environment more conducive to regional integration today than was necessarily the case in the past.

Many important regional integration effects were identified in the previous chapter, ranging from traditional static effects to non-traditional dynamic effects. This chapter will not provide tight empirical applications of these theoretical concepts. Rather material from the preceding chapter will provide the stylised concepts necessary to discuss the prospects for, and effects of, integration in Southern Africa. This chapter makes some links to the range of theoretical issues raised in chapter two. The idea is to look at some of the dynamic trade and trade-related issues in the SADC region in a descriptive sense since these cannot be easily captured in a formal model.

This chapter consists of three main sections. The first section attempts to present a systematic analysis of the structure of the SADC region, including the specific characteristics of country policies and economic behaviour.³ This section assesses the growth prospects of the region and how this may interface with the prospects for regional integration initiatives.

status. The idea of, however presenting a brief analysis, as opposed to a glossary, is simply to give a flavour of contrasting regional institutions in SADC.

³ This thesis focuses primarily on the 12 SADC countries and excludes more recent entrants such as Seychelles and the Republic of Congo.

The second part focuses specifically on trade. Its main objective is to review and evaluate current measures of intra-regional trade and, where possible, the specific products that are traded. This is followed by a review of some descriptive work projecting future trade potential.

The final part looks at some of the difficulties involved in modelling the economic impact of regional integration. In particular it reviews one major contribution to the literature in SADC and draws out some of the implications that this may have for measuring trade potential. This part reviews static models and points to some of the problems with multi-country general equilibrium models. It does not so much look at measurement problems but the constraining assumptions that go into multi-country static trade models.

2. STRUCTURAL CHARACTERISTICS, POLICY ORIENTATION AND THE INTERFACE BETWEEN RI AND GROWTH

We have learnt from more recent approaches to integration that induced dynamic effects should form a critical part of the overall evaluation of the effects of integration. However, realisation of these effects is a function of many other, sometimes complementary, economic policies and the structure of the economies in question.

This part addresses these issues. It pays specific attention to whether size and asymmetry in the level of development biases the prospects for integration. The structure of the relevant economies is one part of this story. The growth behaviour of the economies is also an important consideration in reviewing the prospects of integration. Low and divergent growth is likely to dampen the prospects of regional integration.

One of the more important synergies discussed in the previous chapter is that between regional integration and economic growth. Some attempt will be made to evaluate whether low growth influences the potential for trade. The final section in this part follows directly from the previous one and tries to look at the link between trade policy and growth in order to determine how regional liberalisation affects the picture.

2.1 Is Level of Development and/or Size a Binding Constraint?

There has been interesting theoretical work on what drives trade between countries and whether this is the result of product differentiation or endowment differences. Particularly important was the Linder⁴ thesis that the closer the per-capita income of countries the greater the volume of trade in manufactured products among them, specifically intra-industry trade. If we look at the per capita incomes of SADC countries below we see a high level of asymmetry with a per capita income as low as US\$131 for Mozambique to as high as US\$3376 for South Africa. Mauritius, however, has the highest per-capita income but is an economy that is relatively minute and unsophisticated compared to South Africa.

⁴ Derived from Linder's (1961) representative demand theory giving specific emphasis to per capita income in determining trade flows.

Table 3.1**Characteristics of SADC Countries**

Country	GDP (current) \$USm 1997	GNP per cap \$US 1997	GDP growth % avg ann 1991-97	Population (millions) 1995
Angola	7,662	158.52	0.428	11.072
Botswana	5,069	3,306.95	5.206	1.487
Lesotho	950	734.19	6.861	2.050
Malawi	2,519	163.01	4.621	11.129
Mauritius	4,397	3,796.29	5.291	1.5
Mozambique	2,752	131.06	4.717	16.004
Namibia	3,280	2,195.57	3.529	1.540
S ' Africa	129,093	3,376.77	1.099	41.465
Swaziland	1,313	1,554.72	3.712	0.855
Tanzania	6,919	192.97	3.169	29.685
Zambia	3,865	387.01	1.106	9.456
Zimbabwe	8,905	655.77	2.691	11.261

Source: African Development Bank: African Development Report, 1997.

This obviously implies that if the Linder hypothesis holds, Southern Africa as a region could be expected to show very little potential, at least, for intra-industry trade. Empirical work on this is not entirely clear, as we will see later on. But a more obvious and binding constraint on growing intra-regional trade is the problem of size.

Table 3.2 below provides a ranking of countries from lowest to highest per capita income and contribution to GDP. The simple point illustrated here is the high level of disparity between size of the economy and level of development in Southern Africa. For instance, while Mozambique has the lowest GDP per capita in the region, Lesotho ranks as the smallest economy in the region. Likewise, Zimbabwe has the fourth highest GDP per capita but is the second largest economy in the region. South Africa, on the other hand, is without exception the largest both in terms of the GDP per capita and in terms of the size of the economy. The asymmetry between South Africa and the rest of the region is startling. South Africa accounted for 82% of the total GDP of the region in 1993-5. South Africa and Zimbabwe accounted for close to 90% of the GDP of the region. What this implies is that bilateral trade patterns in the Southern African region are likely to be highly skewed in favour of two or three countries. This will be explored later on.

Table 3.2

Size versus Level of Development

Level of Development		% Contribution to region based on GDP values	
Mozambique	80	Lesotho	0.6
Tanzania	90	Swaziland	0.7
Namibia	166	Mozambique	1.1
Malawi	220	Tanzania	1.5
Lesotho	220	Namibia	1.9
Zambia	370	Malawi	1.9
Zimbabwe	540	Zambia	2.4
Swaziland	1050	Botswana	3.0
Botswana	2590	Zimbabwe	4.1
SA	2902	SA	82.9
Angola	N/a	Angola	
Mauritius	1950	Mauritius	3.3
Notes: Calculations based on 91 to 95 average figures			

Source: African Development Indicators, 1997-8

Another interesting way of measuring the levels of disparity is to compare the variability in the size of the economy with that of other regions such as the NAFTA, EU and Southern Africa. In the case of the NAFTA (consisting of 3 countries), the co-efficient of variation is 143.112. In the case of the EU consisting of a sample of 13 countries, the co-efficient of variation is 111.501. The co-efficient of variation for Southern Africa stands out at 256.28 for a sample of 10 countries.⁵

What is most striking about SADC is that, in the first place, it is unusually small in terms of GDP value even when compared to developing regions such as Asean and Mercusor. This implies that size could potentially be a real binding constraint. Secondly, the level of disparity in terms of levels of development does not correspond with country size.

Table 3.3 shows that figures related to manufacturing contribution to GDP in this region are equally confusing or misleading. The average contribution of manufacturing to GDP in the region is 16%. While this is not insignificant by developing country standards, the relatively small size of many of these economies means that the industrial capabilities of these counties are not as significant as an examination of their contribution to manufacturing appears to indicate. For example, Zambia is, according to the criteria in the table, the most industrialised country in the region. However it's manufacturing value-added in 1990 was less than 10% of the value of total manufacturing value-added in South Africa.

⁵ Calculated from US dollar GDP values (World Development Indicators, World Bank, 1991-6).

Table 3.3**Manufacturing as a % of GDP and MVA, 1995**

Country	GDP %	MVA (US\$mn) 1994	MVA % of Total	MVA % of GDP 1995
Angola	4	234	0.78	3.0
Botswana	4.5	160	0.53	4.0
Tanzania	5	242	0.81	8.0
Namibia	9.3	234	0.78	9.0
Malawi	11.8	215	0.72	18.0
Mozambique	15.1	44	0.15	4.0
Lesotho	15.8	122	0.41	18.0
Swaziland	21	289	0.96	34.0
South Africa	26	25298	84.23	24.0
Zimbabwe	27	1477	4.92	30.0
Zambia	28.6	1026	3.42	30.0
Mauritius	23	694	2.31	23.0
Total SADC		30035	100	
Sources: Economist Intelligent Unit, World Development Indicators (1995), CSS, 1996 Cattaneo 1998b				

South Africa does not have the highest MVA as a percentage of GDP but accounts for 82% of total SADC MVA. The point can be laboured even further – a country such as Swaziland, for example, on its own accounts for the highest share MVA in its GDP but is an insignificant economy in the region.

Not surprisingly, South Africa's total exports and imports dwarfs the SADC total (see Table 3.4). According to 1993 data South Africa accounts for 70% of total SADC exports and 62% of total imports. The second largest exporter after South Africa was Angola that accounted for an estimated 8% of total SADC exports.

Table 3.4

**CONTRIBUTION OF INDIVIDUAL COUNTRIES TO TOTAL SADC
IMPORTS AND EXPORTS**

COUNTRY	% Contribution X	%ContributionM
ANGOLA	8.20	4.80
MALAWI	0.92	1.06
MAURITIUS	3.84	5.39
MOZAMBIQUE	0.39	3.02
TANZANIA	1.21	4.32
ZAMBIA	2.80	2.50
ZIMBABWE	4.46	4.92
SOUTH AFRICA	70.47	62.12
BOTSWANA*	5.60	6.19
LESOTHO	0.28	3.00
NAMIBIA	-	-
SWAZILAND	1.84	2.68

Source: Economist Intelligence Unit, African Development Indicators.

Based on 1991-1995 average.

The importance of size and level of asymmetry does raise some sober questions about the likely effects of greater Southern African integration. These are questions of whether it is realistic to expect growing integration amongst countries with relatively modest GDP values? Or, if there is some evidence to suggest that even amongst these small countries, there is still greater potential for trade creation, will this lead to more convergence or divergence amongst the countries in the region? If the SACU experience is anything to go by, it is likely to lead to more convergence.

2.2 Low Growth and Divergence

Does regional integration matter for economic growth? Put more specifically, can regional integration act as an impetus to growth or does low (and often divergent) growth, influence the prospects for integration? This is an important issue because growth in the Southern Africa region is, by and large, low and highly variable amongst countries with signs of growing dispersion.

Growth and convergence has been given some attention in SADC. A very interesting study points out that countries in SACU have converged while countries in SADC have diverged (Jenkins and Thomas, 1997) in the last three to four decades. This study provides a useful starting point in trying to evaluate what the main trends have been in the Southern African economies in the last few years, but does not provide much analysis as to what the lack of convergence means for regional integration, or what the critical link between convergence and intra-regional trade and investment is.

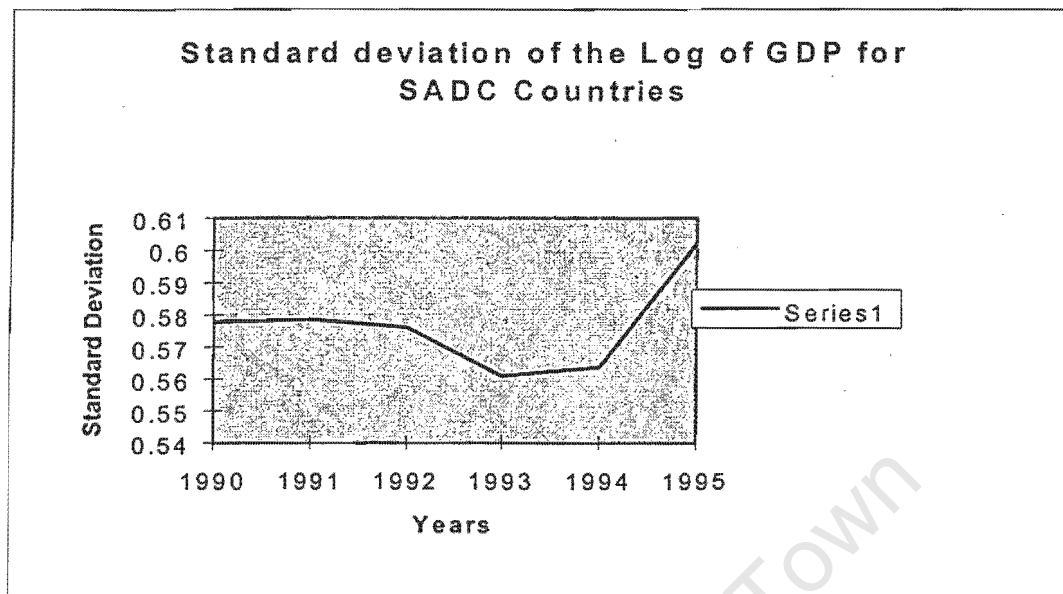
According to Jenkins and Thomas (1997), a downward sloping pattern of convergence shows some degree of convergence in the region.⁶ The pattern of SADC countries between 1960 and 1990 is essentially flat, indicating that no convergence in per capita incomes had occurred over the thirty-year period. The degree of dispersion was marginally higher at the end of the period than at the beginning, which indicates that the countries may have slightly diverged. The absence of convergence amongst the SADC countries may be due to uniquely domestic policy issues which have promoted or slowed growth, including responses to the oil and exchange rate shocks of the 1970s and some problems with the indebtedness of the SADC countries.

⁶ The figures are not reproduced here but refer to Jenkins and Thomas (1997) for a more schematic explanation of this.

In contrast, when examining the sub-sample of SACU countries, a different pattern emerges. There is a downward trend between the 1970s and 1980s, the result being that the dispersion at the end of the period was little more than half of what it had been in the beginning.

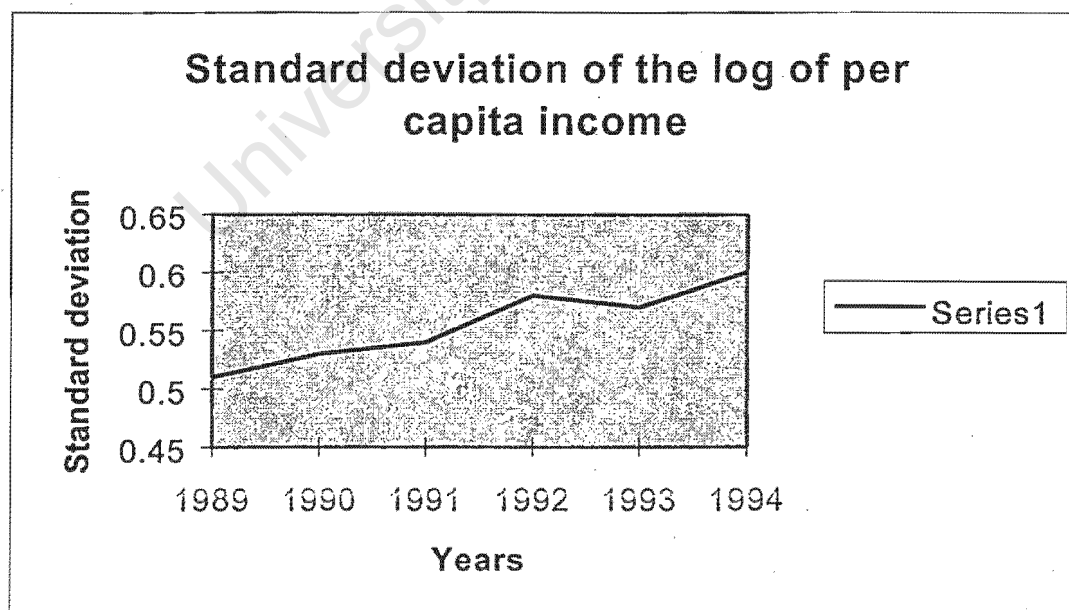
These trends are confirmed by my own calculations of the standard deviation of the log of GDP and GNP per capita in figures 1 and 2. These calculations, however, include all the SADC countries, including individual SACU ones. Although the GDP values show some level of convergence between 1989 and 1993 there is an overall increase in the standard deviation. Unlike the GDP values where there was no great tendency towards divergence, in the early 1990s we can see a consistent pattern of growing divergence in the per capita incomes of SADC countries.

Figure 3.1



Source: Calculated from African Development Indicators, World Bank, 1997

Figure 3.2



Source: Calculated from African Development Indicators, World Bank, 1997

Low levels of growth in a region are not very conducive to growth in intra-regional trade. It is important to emphasise that it is not differential growth rates that would be the main obstacle to growth in intra-regional trade but low growth rates in general. As will be seen later, results from the gravity model show a strong correlation between growth in intra-regional trade and income growth. These issues bear strong relation to an international debate on the link between growth and openness. A good starting point is to look at the external sector in Southern Africa.

2.3 The External Sector: Are SADC Member Economies Closed or Open?

As was noted earlier, a major deterrent to growing intra-regional trade was high levels of protection and inward looking regimes. Clearly, the liberalisation of many Southern African countries will provide an environment far more conducive to regional integration. In many countries in SADC, their structural adjustment programmes have been an important initiator of unilateral trade liberalisation.

The SADC region is typical of many developing regions showing high extra-regional trade intensities but low intra-regional trade biases.

Table 3.5

MEASURE OF OPENNESS: SADC

COUNTRY	1980			1990			1993			1995			1996		
	X/GDP	M/GDP	X+M/GDP	X/GDP	M/GDP	X+M/GDP	X/GDP	M/GDP	X+M/GDP	X/GDP	M/GDP	X+M/GDP	X/GDP	M/GDP	X+M/GDP
ANGOLA				37.7	15.3	53.0	39.8	20.6	60.4	43.7	23.8	67.5			
MALAWI	22.7	24.9	47.5	22.1	16.3	38.5	15.3	15.2	30.5	27.9	49.2	77.0	31.85	25.15	57.00
MAURITIUS	38.0	45.2	83.2	47.1	57.6	104.7	39.8	47.5	87.3	38.7	46.0	84.7	45.54	57.30	102.84
MOZAMBIQUE	13.9	35.5	49.4	8.7	54.7	63.5	9.0	59.5	68.5	10.2	69.5	79.7	13.46	86.30	99.76
TANZANIA	11.3	21.2	32.5	15.8	45.8	61.5	12.4	34.9	47.3	14.4	36.1	50.5	14.01	40.48	54.49
ZAMBIA	37.5	28.7	66.2	38.1	46.0	84.1	29.8	22.8	52.6	30.7	28.8	59.5	28.14	22.03	50.17
ZIMBABWE	27.0	25.0	52.0	25.7	22.1	47.7	27.2	25.6	52.8	34.6	36.8	71.4	35.63	46.32	81.95
SOUTH AFRICA	33.2	23.6	56.8	22.9	16.7	39.6	21.41	16.09	37.49	23.5	17.2	40.8	20.90	20.30	41.20
BOTSWANA	56.1	62.1	118.2	55.2	50.6	105.8	45.2	38.2	83.5	46.9	33.7	80.6	66.46	48.42	114.88
LESOTHO	15.8	115.2	131.0	9.8	111.4	121.2	12.5	114.2	126.7	16.1	91.4	107.6	18.30	113.03	131.33
NAMIBIA	75.0	53.3	128.3	51.7	52.5	104.2	50.4	45.6	96.1	45.8	40.1	86.0	53.80	60.13	113.93
SWAZILAND	63.2	92.3	155.5	63.5	67.2	130.7	69.5	86.4	156.0	80.8	84.0	164.8	67.70	88.72	156.42
AVERAGE	39.4	52.7	92.1	36.2	50.6	86.8	30.2	46.0	76.2	34.4	46.4	80.8	32.98	50.68	83.66

Source: African Development Indicators, World Bank, 1997

Table 3.5 shows the measure of openness of the respective SADC countries including South Africa. Most of the SADC economies are well integrated into the world economy with high values of imports and exports to total GDP averaging 80% between 1980 and 1995. Moreover, many of the SADC countries began liberalising their trade regimes in the 1980s and early 1990s.⁷ The import to GDP ratio has also remained fairly constant although export to GDP dropped marginally. What this analysis shows is that trade as a percentage of GDP in these countries has always been high and as a result has not grown in any significant way. Moreover, the high trade intensity is a reflection of high levels of extra-regional trade with minimal growth in intra-regional trade.⁸

An interesting question is whether Southern African economies are considered closed or open and whether this has influenced growth patterns in the region. One attempt to classify SADC countries is the work of Jenkins and Leape (1998). The open economies, in their classification, are the BLNS countries and Mauritius while the rest of the SADC economies are considered to be close. Their criteria is based on table 3.6 where countries whose exports and imports as a percentage of GDP are considered open along a range from 119.7 to 172.6 and closed along a range from 44.9 to 83.3.

They show that the open economies, in general, perform better than the closed economies in every respect. As shown in Table 3.6, the BLNS countries and Mauritius have far higher growth and investment rates and savings levels. They also have lower current account deficits, lower money supply growth and a lower premium on the parallel rate.

⁷ A detailed country by country analysis of trade reform is beyond the scope of this thesis but there are various World Bank studies that document the process of reform in these countries. See Oyejide et al (1997).

⁸ This definition differs from the Sachs/Warner one.

Table 3.6**SADC Economic Policy and Stability Indicators**

	MORE OPEN ECONOMIES		CLOSED ECONOMIES	
	Range (1990-95)	Average (1990-95)	Range (1990-95)	Average (1990-95)
Real GDP growth (%)	2.3 to 5.4	4.4	-0.4 to 3.5	1.5
Consumer Price Inflation (%)	8.2 to 12.9	11.6	11.8 to 117.9	43.0
External debt to GDP (%)	12.9 to 42.2	27.4	16.5 to 222.0	121.5
Investment to GDP (%)	19.9 to 82.3	37.0	12.9 to 32.8	20.1
Savings to GDP (%)	-26.7 to 31.5	10.8	2.9 to 19.7	11.1
Number with SAPs	One (of five)		five (of eight)	
SAP broadly on Target	One (of one)		zero (of five)	
Aid greater than 20% of imports	3.5 to 15.4	Zero (of five)	1.1 to 95.2	Seven (of eight)
TRADE POLICY				
Openness: exports + imports/GDP (%)	119.7 to 172.6	138.2	44.9 to 83.3	64.1
Current account to GDP (%)	-2.6 to 9.6	3.6	-14.8 to 0.8	-9.2
FISCAL POLICY				
Deficit/Surplus to GDP (%)	-6.9 to 5.7	-1.8	-13.3 to -6.5	-9.7
MONETARY POLICY				
Money supply growth	8.7 to 25.0	14.9	16.3 to 61.0	35.3
Lending rates positive	0.3 to 9.4	Five (of five)	-33.8 to 6.8	five (of six)
Central bank operational independence	Zero (of four)		Three (of eight)	
EXCHANGE RATE POLICY				
Regular overvaluation occurs	Zero (of five)		Three (of six)	
Premium on parallel rate (%)	4.2 to 10.5	7.6	4.2 to 68.9	29.4
Exchange control regime free	One		One	
Exchange control regime liberal	Four		Four	

Source: Jenkins and Leape (1998)

There are several problems with this classification of economies. First, it is important to distinguish between what one could call 'structural openness' or 'institutional/policy-induced openness.' In the former, openness is purely determined by the size of the economy. In other words, trade shares are not terribly reliable measures of openness as a country's trade share is influenced by its economic size. The fact that imports and exports as a percentage of GDP are substantially higher in a small country such as Botswana as compared to a large economy such as USA, has very little to do with trade policy analysis. The latter refers to policies that determine the level of a trade-neutral incentive structure. Many economies in SADC have been open by the first measure but not on the second.

One of the more prominent and recent classifications of openness is the Sachs and Warner (1995) index. They define openness on the following grounds:

- Average tariff rate of less than 40%
- Average non-tariff barriers cover less than 40% of trade
- The black market premium is less than 20% of the official exchange rate
- No communism
- No state monopoly on major exports.

Most SADC economies, in terms of the Sachs-Warner index, were considered closed, specifically in the area of non-tariff barriers, and state monopoly on exports. Most had reduced their tariff rates below 40% by the end of the 1980s.

According to Edwards (1998) although the Sachs and Warner index is an improvement over previous attempts to measure openness, it provides only a binary classification of a country either as closed or open. The problem with this is twofold: firstly, countries with different degrees of trade classification are equally classified as open; secondly

the Sachs and Warner index is only available at one point in time (Edwards, 1998:385). The binary choice of economies as closed or open can be misleading but more importantly countries' policies are in constant adjustment (USITC, 1997). Indeed a major problem is that there is a range of other policies that go along with openness that can influence growth- these are a series of policies that are not directly related to trade such as industrial and technology policies and others.

The Sachs-Warner index, is not well suited to measure the gradations in trade liberalisation which characterise the trade patterns of most countries in the region (USITC, 1997). Rather the index is better suited to capture a dramatic one off change in the trade regime. Indeed, trade ratios, as indicators of openness, are better suited to measure gradual changes in trade policy but equally problematic (for the reasons pointed out above). This problem is compounded by the fact that all the non-South African SACU countries, classified as open by Jenkins and Leape, have artificially high openness ratios because of the SACU revenue formula.⁹ In brief, import values for BLNS countries include the additional revenue compensation from South Africa.

The conclusion is that openness measurements are not a straightforward matter and that many other factors affect the growth of an economy. In the case of Mauritius and Botswana, commodity booms played a critical role in their growth. It is at the same time not obvious that Botswana's economy was more open than Zambia's, for example.

An important question is how do the individual SADC member's growth trajectories influence their neighbours or the rest of the region. Clearly, this will depend on the size of these economies, their

⁹ See appendix 2 for full details.

purchasing power, level of integration or level of openness. Vamvakidis (1998) explores this critical relationship between openness, market size, and level of development of countries within a region. He attempts to measure how these factors foster growth in the home country using a cross-section econometric model. The model underscores the importance of the openness variable in determining how trade policy in one country affects economic growth in a neighbouring country. His results conclude that growth in large open economies will have significant spill-over effects on the domestic growth of small adjacent economies while the size and level of development of closed neighbouring economies will have little or no impact on domestic growth.

These results are somewhat intuitive when one relates them to the Southern African experience. Clearly high levels of economic growth in a small economy such as Botswana, irrespective of whether the economy is closed or open, will have a minimal impact on the growth of the region. Indeed, the growth of South Africa as an open economy will impact on the region far more significantly than if it were a closed economy.

Vamvakidis (1998) argues that trade agreements in the past did not impact on growth even in cases where you may have had one of two potential members in the region that had fast growth. This was because they were small closed economies. Regional trade agreements as part of a broader liberalisation strategy could therefore under certain conditions, impact on growth. He also shows (Vamvakidis 1998b, p 5-8) according to time series evidence that economies, on average, have grown faster after multi-lateral liberalisation, rather than regional liberalisation, both in the short and long run. Open economies grow faster while closed economies grow slower regardless of their participation in a RTA. Non-discriminatory openness fosters

growth, while RTA's can in fact have a negative impact on growth. Even though RTA's and broad liberalisation are not mutually exclusive in theory, evidence in this paper shows that countries rarely follow them simultaneously. RTA's can make a difference if economies are already fairly open but for closed economies, they are irrelevant and sometimes negative.

An analysis of the determinants of growth vis a vis individual SADC countries is beyond the scope of this thesis. The concern here really is whether regional integration can influence growth prospects or vice versa. Indeed, it would be naive to suggest that regional integration will induce growth in the region but could certainly be a contributory factor.

3. VARIOUS DIMENSIONS OF INTRA-REGIONAL TRADE: SOME MEASUREMENT AND EMPIRICAL ISSUES

There are, to date, very few studies in Southern Africa that give clear reasons why we should increase trade, the likely costs and benefits of increasing regional trade, and the form (intra-industry, inter-industry or intra-firm) that an increase in trade is likely to take. Will the growth in intra-regional trade be trade distorting? In other words, will growth in trade be induced more by trade diversion than by trade creation? One of the major indicators of successful integration is for member countries to generate increasing intra-regional trade by reducing the cost to trading in most cases through tariff reduction. The problem is that tariff reductions can cause trade diversion. Hence growth in intra-regional trade has to be welfare enhancing and not driven by trade diversion.

There are two essential reasons why the measurement of trade creation and diversion is difficult in the SADC context. It has been persistently pointed out that one of the greatest difficulties in

measuring intra-regional trade in developing areas, such as Southern Africa, is the paucity of reliable trade data. As mentioned previously, a systematic product by product level data set does also not exist. Moreover, a large part of the trade is informal and goes unrecorded which severely limits the usefulness of official statistics. The second problem, stems from the complex hybrid of differential tariff structures, tariff equivalents and exemptions.

Notwithstanding these problems, this section aims to provide as systematic and detailed an account of trade patterns as is possible from available current trade data. This will serve as an important prelude to the ensuing chapters that will attempt to predict aggregate trade potential. Evidence from this section should provide some ideas as to the trade patterns likely to emerge as trade potential increases amongst the Southern African countries.

This part begins with an overview of current estimates of intra-regional trade flows. It then moves on to explore what the patterns of trade in the region are and reviews some work on intra-industry trade amongst certain pairs of countries. What follows is a focus on the growth in trade between South Africa and the rest of the region. Specific attention is paid to this issue since this thesis is partly motivated by South Africa's specific role in the region and the extent to which trade liberalisation in the region is simply the result of growing two-way trade between South Africa and the rest of the region, with very little trade amongst the non-SACU countries.

This part also looks at bilateral trade surpluses and deficits between South Africa and SADC. The main aim here is to explain this configuration of trade and assess whether this will change in the future or not. It has important implications for non-South Africa SADC countries. The final two sections look at tariff levels and some

preliminary estimates of trade potential. The level of protection in the region gives important signals about changes in relative costs and trade creation and diversion.

Projecting trade potential is not an easy exercise but has been attempted with varying degrees of sophistication. The level and complexity of trade analysis is very much a function of trade data available in the region.¹⁰

3.1 Estimates of Intra-Regional Trade in Southern Africa

Current data suggest that formal intra-regional trade in Southern Africa is estimated around 5%-7% of total extra-regional trade. These estimates exclude South Africa. The problem with estimating intra regional trade in Southern Africa is that this exercise is compounded by the difficulties of attempting to dis-aggregate trade amongst the individual SACU countries. Some progress has recently been made and national governments have attempted to monitor more closely trade in the region.

More recent data show (see Table 3.7) that SADC imports as a percentage of its total world imports are close to 24%. This is high by developing country standards. However, this could give a very distorted picture since a high share of this is accounted for by the overwhelmingly high share of BLNS countries' imports from South Africa within the SACU arrangement. In other words, intra-SACU trade has often been excluded from the measurement of intra-SADC trade figures.

¹⁰ See chapter 5 for a detailed discussion of the geographical SACU aggregation problems with data.

Table 3.7**SADC countries overall imports from other countries, 1995****US \$ Billion**

	Global Imports	Intra-SADC Imports	Share of intra-SADC
Botswana	1.88	1.52	80.8
Lesotho	1	0.84	83.7
Malawi	0.48	0.22	45.8
Mauritius	1.94	0.23	11.9
Mozambique	0.73	0.24	32.9
Namibia	1.6	1.47	91.9
RSA	30.55	2.27	7.4
Swaziland	1.11	1.11	100
Tanzania	1.54	0.13	8.4
Zambia	1	0.32	32
Zimbabwe	2.66	1.12	42.1
Totals	44.49	9.487	21.3*

Source : Imani, (1997)

*please note that the Share of Intra-regional trade with SACU as one country is half (9.67)

It is important to take cognisance of the fact that trade figures based on mirror import data could exaggerate intra-regional trade in SADC as import figures are reported on a c.i.f. basis as opposed to exports which are recorded on f.o.b basis.¹¹ However, countries tend to more accurately record imports for revenue purposes. Hence despite the slightly exaggerated figures, they are more reliable than any other data.

Table 3.8 shows that if we factor out intra-SACU trade from the region, than we find that SADC imports as a percentage of total world imports almost halves to 6%.

¹¹ Generally import data differ from export data by a margin of 5% to 10%.

Table 3.8**Intra-SADC Trade With SACU as one Country, 1995, US\$ Billion**

Intra-SADC Imports	2.917		
Extra-SADC Imports	44.49		
Percentage Ratio	6%		

Source: Calculated from Stahl, (1997)

What is particularly interesting is that intra-SACU trade accounts for close to 70% of total SADC trade. Intra-SADC trade, with SACU excluded, accounts for a low 2% of total trade. Trade between SACU and SADC accounts for close to 29% of total intra-regional SADC trade.

Table 3.9**Intra-SACU vs. Intra-SADC Trade, 1995**

	US\$(billions)	% of total
Total Intra-SACU Trade	6.57	69.23
Intra-SADC(non-SACU Trade)	0.19	2.00
Inter SACU-SADC Trade	2.73	28.77
Total Intra-SADC Trade	9.49	

Source: calculated from Stahl, (1997)

Total SACU trade amounts to about US\$6.5 billion. Total intra-SADC trade is about US\$9.5 billion dollars. As is clear from Table 3.10 below an overwhelming amount of SACU's imports in the SADC region

originate within SACU. In the case of South Africa, close to 80% of South Africa's imports from the SADC region are from SACU. In the case of BLNS, an average of 95% of total intra-SADC imports are sourced from SACU.¹²

Table 3.10

Intra-SACU Trade as a Percentage of SACU Trade with SADC (1995)

	(US \$ Billion)		
	SACU Imports from SADC	Intra-SACU Imports	Percentage*
Botswana	1.52	1.41	92.76
Lesotho	0.84	0.84	100.00
Namibia	1.47	1.45	98.64
RSA	2.27	1.77	77.97
Swaziland	1.11	1.1	99.10
Total	7.21	6.57	91.12

Source: Calculated from Stahl (1997), Imani (1997)

3.2 Estimating Regional Trade Bias

Drysdale and Garnaut(1993:190) introduce a novel way of looking at the obstacles to trade. They introduce the concepts of objective and subjective resistance. The former referring to transport, communications and general transaction costs including protection. The latter, on the other hand 'comprise a range of social, psychological and institutional factors that cause prices to vary across geographic space by larger margins than can be explained by the necessary costs of overcoming objective resistance.' The source of subjective resistance is typical of what characterises developing country regions such as Southern Africa where there is widespread information asymmetry, language differences and divergent legal systems.

¹² Catanneo (1998b) gets similar results on 1993 data. See Appendix 3

It was shown that countries in the Southern African region, in general, are fairly open in terms of their import and export to GDP ratios. The share of intra-regional trade in a regions total trade is not a very reliable indicator of trade bias for the following reasons:

- a) if, holding the number of countries in each region constant, the home region represents a large proportion of world trade then regional trade shares will be high when in fact it may be lower by some normative standard.
- b) the regions share of world trade increases arbitrarily if the region is divided arbitrarily by more countries (Drysdale and Gaurnaut, 1993:195).

In view of these problems a more reliable indicator of trade bias is the regional trade intensity index. The intensity index compares the size of a bilateral or regional trade relationship with what it would be if there were no variations in trade shares across bilateral trading relationships. Hence, the arbitrary influence of the size of the region on regional trade shares is removed by using the intensity of trade index (Drysdale and Gaurnaut, 1993).

The intensity index is defined for country i 's exports to country j as the share of i 's exports to j (X_{ij}/X_i) relative to the share of j 's imports (M_j) in world trade (T).

$$I_{ij} = (X_{ij}/X_i)(M_j/T)$$

Table 3.11

Regional Trade Bias

Country	Trade Co-efficient
ANGOLA	0.156578107
MALAWI	7.694329085
MOZAMBIQUE	5.301442491
SACU	9.580086783
TANZANIA	1.874028826
ZAMBIA	2.354988095
ZIMBABWE	38.04527856

Calculated from IDC's data for average 1991-1993 figures.

The trade co-efficients, given the formula above (table 3.11), were calculated using the exports of a SADC member country to SADC divide by that country's total world exports multiplied by SADC imports as a percentage of world imports. It is clear from the trade-co-efficients that Zimbabwe seems to have the highest regional trade intensity followed surprisingly by South Africa, Malawi and Mozambique.

Clearly, trade intensities at a bilateral level will differ for countries as some are more integrated than others owing to, among other reasons, size, historical factors and trade arrangements. A comparison with the trade intensities of Mercusor is instructive. Table 3.12 reflects this comparison. What is interesting is that the two largest countries in the bloc, Argentina and Brazil have the highest trade intensity bias.

Table 3.12

Trade Intensity Index-Mercusor

		1991	1995
Argentina		14.9809	24.29829
Brazil		39.55879	53.90437
Paraguay		0.921921	0.95051
Uruguay		1.968933	2.45278
Source:			

Notes: Formula: Exports/Mercusor's exports / Mercusor's total imports/total world imports

Source: IMF (1992 and 1996)

In contrast, Zimbabwe as the second largest economy shows the highest intra-regional trade intensity. South Africa's intra-regional intensity is likely to increase as its trade has grown exponentially (see below) with the region.¹³ These estimates show that there is a greater regional bias for the larger economies rather than the smaller ones. This confirms a point made earlier that size is an important constraint to regional integration.

The problem of intra-regional trade estimates in Southern Africa is compounded by speculation that unrecorded trade overwhelms recorded trade. There is general scepticism that analysis of intra-regional trade in Southern Africa based on official data is flawed since it grossly underestimates the level and significance of intra-regional trade.

¹³ An attempt was made to estimate intra-regional trade bias for SADC, like Mercusor, for different periods in order to assess whether countries in the region have experienced growing regional intensity. The inconsistency of data has produced results that do not make sense.

Despite this glaring problem most of the literature simply acknowledges the problem without proposals as to how to deal with it. Part of the problem stems from the fact that there is no defined methodology on estimating informal trade. This raises an important question as to what should be done, at least at the level of research, in respect of unrecorded trade.

Perhaps more important is the role that intra-regional trade liberalisation has played in now incorporating previously illegal trade into mainstream trade. In most cases the transaction costs to illegal trade are high because of the uncertainties associated with it but high tariffs still make it worthwhile. Through the simultaneous reduction of intra-regional tariff and non-tariff barriers agents would have no incentive to trade illegally. This suggests that part of any increase in trade accompanying regional tariff preferences may not be new trade but merely informal trade being formalised. At the end of the day, there is not much that can be done about informal trade except to acknowledge the limitations of recorded trade data.

3.3 Trade Patterns

Not only would we be interested in the potential for increasing trade in the future but also what sectors in which countries are likely to benefit from a FTA. Intra-regional trade in manufacturing in SADC is much higher than intra-regional trade in mining and agriculture. Figures taken on an average for 1991-1994 based on US dollars¹⁴ suggest that agricultural SADC trade as a percentage of total SADC trade is particularly high for countries such as Tanzania and Mozambique and particularly low for countries such as South Africa and Zimbabwe. In Zimbabwe's case, agricultural exports to SADC constitute at least 60% of its total SADC exports but only 2.8% of its total SADC imports. The case of SACU shows the reverse trend with

agricultural imports much higher than agricultural exports (IDC, 1996).

In the case of mining, regional trade intensities are particularly low, with SACU's mining exports to SADC as a percentage of its total SADC exports at less than 5%, followed by Zimbabwe at just under 4%.

These two countries have the highest share. Import trends mirror the exports trends with the exception of Zambia that has a marginally higher mining import-intensity relative to the other countries at 7.16% (IDC, 1996).

Manufacturing, at the other extreme, has exceptionally high regional trade intensities. In both imports and exports, manufactures account for over 80% of every SADC member's contribution to their total SADC trade. Manufactured exports to SADC are particularly high for SACU at 93%. What is interesting to note is that SACU imports of manufactures from SADC are also relatively high partly because SACU's agricultural trade policy regime is more protective than is its industry regime. Most of the manufacturing products imported from the region are relatively labour-intensive products.

It is at this stage important to determine what the likely evolution of trade patterns will be in the region. Whether growing intra-regional trade is likely to be inter-industry or intra-industry, will be very important both for reasons of economic efficiency and the fact that different kinds of trade patterns have somewhat different adjustment costs. Increasing intra-industry trade means that countries may have to specialise within sectors. For example, in the clothing sector, South Africa may have to specialise in up market men's suits and sacrifice clothing products at the bottom end of the market. The adjustment

¹⁴ It is important to emphasize that this data may not be accurate and is based on estimates.

costs are less onerous than closing down an entire sector and redistributing capital and labour to a more efficient sector.

Estimating intra -industry trade is fairly straightforward where a Gruebel -Lloyd method is used aimed at providing an index on the level of intra -industry trade.¹⁵ This index simply refers to the following:

$$((X_j + M_j) - (X_j - M_j)) / (X_j + M_j)^{16}$$

where:

X_j -Exports of product j

M_j - Imports of product j

In terms of the Gruebel-Lloyd index- when the value is zero there is no intra-industry trade when it is one there is perfectly matching intra-industry trade. While the significance of the index is easy to understand, the complication arises when data at a high level of disaggregation is not available to determine if there is real intra-industry trade.

It is more difficult to predict what the likely evolution of trade in the region will be in the future. However, Msundo(1996:25) attempts to compose an index of intra- industry trade and econometrically estimates the influence of various factors on the level of intra-industry trade in the region. She regresses intra-industry trade against a range of explanatory variables such as differences in per capita income between the bilateral trading partners, size of the countries, levels of per capita income, distance and level of trade barriers and a series of dummies. Her results show that trade barriers

¹⁵ See Msundo (1996) and Cattaneo (1998b) for a discussion of the Gruebel-Lloyd index.

¹⁶ There is some debate on the accuracy of these calculations because measurement of intra-industry trade is a function of the trade data classification. Part of the problem is that the aggregation of the data used in both cases is too broad (2 digit) to make any real sense of intra-industry trade.

and distance are major obstacles to intra-industry trade.¹⁷ She does, however, show that a large part of trade in Southern Africa is intra-industry.

Table 3.13 looks at intra-industry trade as a percentage of total bilateral trade focusing on two countries, Zimbabwe and Zambia. The contribution of intra-industry trade amongst Zimbabwe and Zambia, Zimbabwe and Malawi and Zimbabwe and Mozambique are all above 40%. Intra-industry trade is also significant for a combination of other countries trading with Zimbabwe. Likewise, we see similar results with Zambia and a combination of countries. A striking result is Zambia's level of intra-industry trade with Tanzania at 72%.

Table 3.13

Intra-industry trade as a ratio of total bilateral trade and the average share of IIT for some countries in the PTA/COMESA region, 1991

Zimbabwe with	RATIO of IIT in Total	Average IIT	Zambia with	RATIO of IIT in Total	Average IIT
Angola	32.24	9.05	Angola	-	-
Kenya	19.1	45.5	Botswana	28.76	34.76
Lesotho	22.5	37.4	Egypt	-	-
Malawi	48.1	22.2	Kenya	-	-
Mauritius	10.4	21.7	Malawi	64.14	21.86
Mozambique	40.6	19.4	Namibia	41.70	23.92
Burundi	-	10.8			
Ethiopia	36.4	52.9	South Africa	22.88	18.23
Namibia	9.3	15.3	Swaziland	0.3	16.33
Sudan	1.78	3.53	Tanzania	72.24	25.31
Swaziland	19.5	16.6	Zaire	-	-
Tanzania	27.73	4.33	Zimbabwe	29.52	27.61
Zambia	54.74	19.91	-	-	-

Source: Msundo, 1997

¹⁷ As will be shown later on, distance is also a significant explanatory variable in the gravity model.

Most work attempting to dis-aggregate intra-regional trade at the product or sectoral level has to be treated with a great deal of circumspection as the data has proven to be consistently unreliable. Cattaneo(1998b) calculates intra-industry trade between SACU and Zimbabwe.¹⁸

Table 3.14 gives a ranking of indices (in percentage terms) of intra-industry trade between SACU and Zimbabwe and SACU and the rest of the world (ROW) for selected sectors based on 1994 data. These findings confirm Msundo's results that there is a greater tendency for intra-industry trade within the region than there are with extra-regional partners.

¹⁸ Cattaneo(1998b:221) views these results as tentative for reasons of which are several- they are unadjusted.

Table 3.14**Intra-industry trade SACU – Zimbabwe and SACU –ROW,¹⁹ 1994**

Sector	SA – ROW	SACU – Zim
Meat processing	42.72	92.32
Other fabricated metal products	72.25	88.56
Miscellaneous products of petroleum and coal	51.9	85.9
Structural metal products	27.84	85.25
Furniture and fixtures of metal	54.25	83.8
Agricultural machinery	17.97	82.47
Knitting mills	54.47	75.62
Confectionery	70.52	74.99
Fruit and vegetables	13.3	72.58
Grain mill products	51.97	72.41
Prepared animal feed	59.93	68.87
Spinning and weaving of textiles	62.7	65.45
Motorcycles	23.26	60.78
Paper containers	11.43	57.2
Other electrical apparatus	27.97	53.69
Medicinal and pharmaceutical preparation	10.58	46.54
Non ferrous metal basic industries	39.66	42.45
Soft drinks and carbonated water	11.91	39.66
Transport equipment nec	12.19	37.1
Iron and steel basic industries	21.33	31.64
Electrical appliances and housewares	15.67	29.97
Radio, television and communication equipment	11.68	27.36
Other rubber products	18.23	26.23
Office and accounting machinery	8.35	18.83

Source: Cattaneo (1998b)

Note: Co-efficients in percentages

In several products in the table above there are fairly large differences in the level of intra-industry trade between South Africa and Zimbabwe and South Africa and the ROW. Some interesting cases are transport equipment, soft drinks and agricultural machinery. This implies that the scope for intra-industry trade in high value added products is high amongst these two countries.

¹⁹ See appendix 4 for a more detailed list.

These measures are very interesting in as far as the gravity model (employed later on) has been widely used to look at the determinants of intra-industry trade which is naturally distinct from inter-industry trade. Although data constraints have precluded an assessment of potential intra-industry trade in SADC these estimates add richness to the trade potential estimates later on (see next chapter for further discussion).

3.4 The Consequences of Growth in Trade between SA and the Rest of SADC

A notable feature of South Africa's export performance since the early 1990s is the increased pace of export growth to the African region, particularly to SADC. The growing trade surplus has become an important issue politically. The aim of this section is to explain the causes of South Africa/SADC trade. The use of the gravity model later on will make some projections of whether bilateral trade balances will change in the post-FTA period.

SACU's trade with Africa has expanded rapidly in the last few years - by 40% in 1989; 22% in 1990 and 25% in 1991, slowing down to 9.43% from 1992 to 1993 but picking up to 23.4% from 1993 to 1994 (these are calculations based on nominal Rand value terms). From the perspective of SADC countries exporting to South Africa, the percentage growth of exports have increased in 1993 to 1994 by 22.61% from a low growth of 2.87% the previous year, implying greater two-way trade flows.

Table 3.15 documents South Africa's growing surplus with the SADC region. SACU²⁰ enjoyed a R3.4 billion trade surplus in 1992 with

²⁰ Figures are given for SACU but South Africa accounts for 99 per cent of the trade surplus with non-SACU SADC.

SADC. This increased to R4.5 billion in 1994 and has grown consistently, peaking at R12.7 billion in 1997.

Table 3.15

SACU's Growing Trade Surplus with Southern Africa(SADC)

Year	Surplus (Billion Rands-Nominal)
1992	3,4
1993	3,9
1994	4,5
1995	6,6
1996	9.9
1997	12.7

Source: Industrial Development Corporation (1998)

Moreover, if one looks at SA/SADC trade, for which figures are less readily available, the trade surplus in favour of South Africa is likely to be higher as it enjoys higher levels of trade with the BLNS countries.

A further dis-aggregation of trade (Table 3.16) shows that the main source of SACU surplus in the region is accounted for by manufacturing. SACU enjoys a surplus with all countries in the region whereas in agriculture and mining there are some countries with whom there are bilateral deficits. In the case of agriculture, SACU has deficits with, at least, three countries while the surplus with the rest are fairly low.

Table 3.16

**SACU'S IMPORTS AND EXPORTS TO SADC BY SECTOR IN
MILLIONS OF RANDS**

			1996						
	Agriculture			Mining			Manufacturing		
Country	Imports	Exports	SURPLUS*	Imports	Exports	SURPLUS*	Imports	Exports	SURPLUS
Angola	1.2	43.7	42.5	129.1	0.5	-128.6	2.3	490.1	487.8
Malawi	59.8	15.3	-44.5	0	1.4	1.4	200	823.7	623.7
Mauritius	0.4	61.4	61	0	8.9	8.9	26.8	725.8	699
Mozambique	57.8	190.6	132.8	0.6	4.8	4.2	41.2	1941.4	1900.2
Tanzania	12.5	7.7	-4.8	0.1	20.8	20.7	6.6	521.2	514.6
Zambia	18.6	42.9	24.3	40.5	82.2	41.7	77.1	1896.8	1819.7
Zimbabwe	253.2	124.4	-128.8	30.8	8.5	-22.3	797.8	4618.8	3821

Source: IDC (1996)

Notes: * implies surplus or deficit

Table 3.17 looks at individual countries' trade deficits (or SACU surplus) as a percentage of their GDP. Countries incurring the highest debt with South Africa are Zimbabwe accounting for \$1 billion of South Africa total surplus with SADC, while Mozambique and Zambia make up another million dollars. What is striking is that the trade deficit as a percentage of Mozambique's GDP is close to 50%.

Table 3.17: SACU Bilateral Surplus as % of the GDP of Individual SADC countries, 1996.

	\$m	\$m	\$m	
Country	SACU's Exports	SACU's imports	SACU surplus	A*
Angola	147.3	36.5	110.7	1.56
Malawi	231.7	71.6	160.0	14.55
Mauritius	219.4	7.4	211.9	6.18
Mozambique	589.1	27.4	561.6	46.81
Tanzania	151.5	5.3	146.2	3.95
Zambia	557.4	37.5	519.9	13.00
Zimbabwe	1310.	298.3	1011.8	18.07

Source: IDC (1996), SADC (1997)

Notes:

- i) * A is total deficits of individual countries with SACU as a percentage of their relative GDPs.
- ii) Sacu's Exports and Imports converted to U.S \$ by dividing the amount by the 1995 Rand exchange rate.

There are various explanations for the trade surplus. Firstly, many SADC countries have been liberalising their economies in the last two decades specifically under World Bank driven structural adjustment programmes, engendering increasing imports to GDP ratio's in most countries (see Table 3.5). Secondly, while many SADC countries may have high overall trade deficits with South Africa their overall trade balances have not changed significantly. Thirdly, South Africa has gained increased market share in the SADC countries (substitution effects). This can partly be attributed to the post-sanctions effect where many of the country's exports, specifically in manufactures faced sanctions in these markets.

As I will show in the next section South Africa has been developing a high trade surplus with the region despite the absence of tariff preferential advantages. If the trade surplus were to grow within the context of an agreement, it would put South Africa under more pressure to provide compensatory mechanisms. However, what is

ignored in the literature is that total trade deficits or surpluses seem rightly to be perceived as a macro-economic issue whereas bilateral trade accounts are treated as a micro-issue bringing into question issues such as comparative advantage and unfair trade. This has been evident in US-Japan trade wars specifically in the 1980s. More pertinently, South Africa's growing trade surplus with SADC countries has become a politically loaded issue and has fuelled misconceptions about South Africa's trade and industrial policy regime.

The significance of introducing some discussion on trade balances is simply to dispel the myth that South Africa is trading unfairly with the region. Trade balances, like trade flows re-inforce the fact that intra-regional trade is underscored by South Africa exporting bilaterally to every country in a far more significant degree than it imports. These actual trade balances also provide an important baseline against which one is able to compare predictions based on the gravity results produced later on. These results may give some clues as to whether trade balances would change in the future.

3.5 Determinants of Bilateral Trade: The Case of South African Exports to SADC²¹

This thesis has been motivated by a consideration of the implications of growing South African trade in the region. The increase in trade between South Africa and the rest of the region has been in both directions although the magnitude of absolute values between SA's exports to SADC and SADC's exports to SA is vastly different. There is growing concern about the political consequences of these growing

²¹ Ideally what is required here is an export demand function to explain South Africa's export behaviour in a specific market (Africa). Unfortunately, time series data problems preclude this kind of analysis from being undertaken.

and soaring deficits that non-SACU SADC countries have been experiencing.

The key question is what potential there is to improve the trade imbalance in favour of non-SACU SADC countries. Will more systematic access to the South African market improve the regional balance of payments with rest of SADC? This question cannot be answered very systematically as we require detailed information on the comparative advantage of countries vis a vis their regional trading partners. What is also needed is some geography-specific export demand and supply response elasticities. However, despite the absence of this kind of analysis some tentative conclusions can be made from the observable trade data specifically between South Africa and the rest of the region.

The first question really is how we can explain South Africa's growing exports into Southern Africa- is it based on comparative advantage or some aberration? Growth in South African manufactured exports in nominal terms from 1993 to 1997 has been 18.4 percent and about 10% in real terms.²² This can be explained by three broad factors:

- Trade policy changes inducing industrial restructuring in the domestic economy and changes in comparative advantage
- The exchange rate – more conducive to manufactured exports than in the past
- Post-sanctions effect – under apartheid manufactured exports really bore the brunt of sanctions.

Africa, specifically Southern Africa, accounts for a large percentage of growth of SA's manufactured exports. As mentioned earlier South Africa's exports to the region have not been determined by preferential

²² This is calculated from IDC data and refers to annual average growth rate.

rates. In other words, the country's exports to the region have grown without receiving any preferential tariffs in destination countries.

Table 3.18, although un-weighted, gives some idea of the aggregate tariff rates that South Africa faces in different markets. As we can see tariff rates within SADC rate as the highest. The table demonstrates that South Africa's exports may not be a case of trade diversion as it does not, in general, enjoy tariff preferences in the Southern African market.

Table 3.18

Average Import Tariffs per Region, 1997

	SADC (Excl SACU)	Africa	Persian Gulf	Asia	Oceania	South America
Animal & Vegetable oils, fats and waxes	19%	21%	9%	11%	2%	13%
Beverages and Tobacco	30%	36%	20%	57%	3%	16%
Chemical and related products	24%	15%	7%	6%	2%	8%
Crude materials, inedible excl. fuels	17%	13%	6%	5%	1%	7%
Food and live animals	18%	34%	12%	20%	2%	14%
Machinery and transport equipment	22%	20%	7%	6%	5%	9%
Mineral fuels, lubricants and related materials	22%	13%	6%	3%	1%	6%
Miscellaneous manufactured articles	21%	33%	13%	11%	11%	15%
All products	21%	24%	9%	13%	3%	11%

Source: IDC, 1998

Note: Simple averages for certain countries

Secondly, South Africa's export profile in the African market differs fundamentally to its export profile to other markets. The nature of South Africa's export potential in the international and regional markets has been well documented. Data for 1994 to 1996 (average) shows that South Africa's largest exports (excluding unclassified goods such as gold and arms) in decreasing order (based on Rand value) are: precious and semi-precious stones, base metals, mineral products, chemical products, machinery and appliances, motor vehicles and parts, and vegetable products. It is surprising that South Africa exports a sizeable proportion of chemical products and machinery and appliances to the African market when in fact it is considered not to be terribly competitive in these products internationally. The country's seven largest imports (in decreasing order) are the following: machinery and appliances, vehicles and components, chemical products, plastics, textiles, optical and photographic, and base metals.

Areas where South Africa has a particularly favourable trade balance are in mineral products, precious stones and semi-precious stones and base metals. On the other hand, South Africa has a negative trade balance in chemicals, plastics and textiles. Areas where the trade balance against South Africa's favour is particularly high, are in machinery and appliances, vehicles and others. Although South Africa typically exemplifies a traditional developing country export profile with a preponderance of primary exports as a percentage of total exports, a geographical dis-aggregation provides a rather different picture, specifically with South Africa's exports to the African market. Some 40% of South Africa's total manufacturing exports currently are destined for the African market.²³

²³

Although the data is presented as SACU exports to Africa, one could comfortably

Two categories where South Africa has a very unfavourable trade balance in international markets constitute some of the country's major exports to the African market. Categories, mechanical and electrical equipment account for 41% of South Africa's total exports to Africa, while transport equipment and instruments and apparatus account for 30% and 34% respectively.

Preliminary evidence suggests that South Africa's close geographical proximity to the regional market may be an important factor explaining the country's ability to compete in certain products with third-country suppliers. In particular, c.i.f. costs are considerably less for South Africa than they are for third country suppliers. Another factor considered important in explaining South African manufactured exports to the region are licensing agreements which forbid South Africa from exporting to the international market, but allows it to export to the regional market. This is, however, anecdotal, and has to be corroborated by more micro-based research.

What then are the prospects for changes in the direction of trade? One of the ways in dealing with polarisation²⁴ is by introducing an asymmetrical liberalisation schedule under the currently negotiated FTA. The idea of asymmetry was mooted as a process by which larger and more developed countries, South Africa in this case, would make deeper and more generous tariff concessions, while some of the less developed countries would be given more leverage in order to deal more effectively with adjustment costs.²⁵

estimate that more than 98% of exports in these three categories emanate from South Africa, rather than the BLNS countries.

²⁴ By polarisation I refer to growing disparity between South Africa and the rest of the SADC region.

²⁵ The tariff phase out with SADC member countries is currently being negotiated.

- There has been a period of economic reform and trade liberalisation in countries such as Mozambique and Malawi making it, once again more conducive to investment.
- Differential wage rates – anecdotal evidence suggests large variations in wage rates. For example, wages in the clothing sector in Malawi are one eighth of that in South Africa and one nineteenth in Tanzania.

There is no systematic analytical study of the determinants of South African investment in the region, except anecdotal evidence of where investment is taking place. South African investment in the region has been occurring predominantly in four sectors- mining, consumer retail, hotel and leisure and food and beverage and in some exceptional cases, labour-intensive manufactures such as clothing (SADC, 1997).

Indeed most of this growth in investment in SADC predates the conclusion of the FTA.²⁶ The important question is to what extent will differences in factor costs (mostly labour) amongst countries in the region result in growing mobility in factor flows (mostly capital). More importantly, how will the change in trade costs, partly induced by the FTA, affect the relocation decisions of firms.

To make any serious judgements of these issues more micro information is necessary which is not yet at our disposal. The important point to acknowledge is that the trade potential of SADC could be driven to a large extent by factor flows. One could anticipate a NAFTA scenario where South African firms could relocate to take advantage of labour costs and yet supply, tariff or duty free, the South African market.

3.7 Is Protection Serious in SADC? ²⁷

It is important to get a feel for the nature of protection in the SADC to give some idea as to whether there is likely to be any trade diversionary effects from a potential FTA. The growth in intra-regional trade will depend on a range of factors. At one level, post integration trade potential depends on the difference that tariff elimination and NTBs make to domestic prices and production in respective markets. At another level, tariff (or NTB) reductions have to be seen against the backdrop of natural, geographical or historical factors that may act as an impediment to growth in trade. One of the obvious problems is the high transaction costs associated with intra-regional trade. This section focuses specifically on tariffs but is preceded by a short section on NTBs.

3.7.1 NTBs

A number of authors (see Ncube, 1995; Maasdorp and Whiteside, 1993; ABD, 1995) working on Southern Africa have examined in varied detail some of the important economic underpinnings of regional integration by identifying some of the main barriers to trade.

Typically there is a tendency in the literature to identify key NTBs but no attempt to link or quantify these into an analysis of the implications these costs hold for trade. Some of the NTBs identified are the following; firstly, quantitative restrictions such as a quota. These are, however, becoming less prominent as many countries have liberalised by converting quantitative restrictions into ad valorem tariffs.

²⁶ It is difficult to establish whether some of it is taking place in anticipation of an FTA.

²⁷ This section draws mostly from Jenkins and Leape (1998).

Secondly, a barrier created by non-convertible currencies or foreign exchange shortages, which often acts as a deterrent to trade.²⁸ This is also becoming less of a problem as countries have liberalised their financial sectors and have at least, in worst case scenarios, moved to partial convertibility.

There are also bureaucratic delays, basic information asymmetries, and lack of standards and harmonisation. This is compounded by tied aid practices or the policy of sourcing of donors who may be financing more than fifty percent of imports of many countries in the region.

It is clear that one could identify an endless list of non-tariff barriers in the region that contribute to the high transaction costs to trading. There have however, been very few, if any, attempts to at least quantify these transaction costs by, for example, comparing the cost of trading intra-regionally to that of trading extra-regionally. Once again, this would require detailed firm surveys as well as an identification of firms that are exporting similar products in different markets.

3.7.2 Tariff Protection

The level of tariffs in SADC countries could influence the welfare outcomes of regional agreements. Forming a FTA with high external tariffs could certainly be trade diversionary. Moreover, post integration trade will depend on the difference that tariff elimination or other non-trade barriers will make to domestic prices and production in respective markets (Page, 1997).

There is, at present, a high level of both intra-country and inter country dispersion of tariff rates in Southern Africa, although there is a slow process of convergence occurring. This can be explained by the

²⁸ This may be true for trade in general and not only intra-regional trade.

fact that most countries have been going through a process of trade liberalisation for the last ten years with varying degrees of intensity and speed. This unilateral liberalisation within the respective countries plays an important role in gradually reducing the wedge between intra-regional and extra-regional tariffs, specifically in the case of COMESA and other bilateral agreements. It is against this backdrop that the SADC initiative of a free trade agreement is taking place.

It is difficult to provide a systematic analysis of levels tariff protection amongst SADC countries, once again, owing to uneven data availability. Other problems include the differences between bound and applied tariffs. Some of the tariff data released by SADC countries includes their bound WTO tariff obligations and not what is actually applied. The measurement of tariffs is further complicated by the effective duty collection rate, which is very low in most countries.²⁹ Moreover, the multi-tier tariff structure owing to a hybrid of trade agreements and exemptions for tariffs has posed particular challenges. This section attempts to flesh out some of these difficulties and make some general observations about what the current levels of protection imply for regional integration in Southern Africa. It provides nothing more than a snapshot of tariff levels and changes in selected SADC economies.

Mauritius is the only country outside of SACU that is classified as open according to the Jenkins/ Leap definition (see section 2.3). The tariff structure, which consisted of 60 different tariff rates, was reduced to eight rates in 1994. The maximum MFN rate was reduced from 600% to 80% and 4400 products were subject to significant tariff reductions.

²⁹ Work in progress at the World Bank shows shockingly low duty collection rates in some countries.

Tariffs in Malawi follow a cascading structure with capital goods and raw materials being mostly zero rated, intermediate goods have rates at between 10% and 30% and finished goods rates of up to the maximum MFN rate of 45%. In the case of Mozambique, import duties were lowered towards the end of 1996, with a maximum tariff of 35%. However, the tariff book still has a mixture of tariffs for similar goods. The new tariff book that was issued towards the end of 1996 has grouped tariffs into finished products, intermediate products, capital goods and raw materials.

A new customs tariff was introduced in 1996 in Tanzania based on the harmonised system at the eight-digit level. The tariff structure included six rates: 5%, 10%, 20%, 25%, 30% and 40%. No products are zero-rated. In June 1995 the maximum rate was reduced to 30% and these also follow a cascading structure.

Zambia's tariff structure has also been rationalised. This resulted in a cascading tariff structure ranging from 0% to 5% for most capital goods and raw material, 15% for intermediate goods and 25% for finished goods. The Zambian tariff structure reserves high duties for two categories of products i.e. clothing and textile and a few other categories of products, all these face a duty of 25%.

The Zambian average tariff is 16%. It is almost two-thirds the value of the highest nominal tariff. At the bottom of the tariff scale there is diversity of manufactures, indicating lower tariff rates for manufactured goods although cereals and vegetables enter under these codes.

Table 3.19

Average rates applied to imports of products in different sectors in Zambia in 1996.

Average rate of just over 20%	Food (excluding cereals).
Average applied rate of 18.2%	Agriculture
Average applied rate of 13.5%	Manufacturing
5%	Cereals and maize
Maximum rate of 25%	Applied to prepared food, fruit and a certain category of processed food crops

Source: adapted from Jenkins and Leape, 1998

What is particularly interesting is the changing tariff structures of the two major economies in the region- Zimbabwe and South Africa.

Zimbabwe announced a new tariff regime in February 1997.

Table 3.20

New tariffs applied to different categories of products in Zimbabwe.

Category of products	Old tariff	New tariff
Raw material	0% to 40%	Flat rate of 5%
Educational good	0% to 40%	Flat rate of 5%
Medical goods	0% to 20%	0% to 20%
Capital goods	0% to 25%	
Tools	0% to 20%	5 to 15% and a flat rate of 15% applied to spares
Processed goods	0% to 55%	Flat rate of 15%
Intermediate and consumables	0% to 35%	20% to 50%
Finished goods		40% to 85% with the highest duty imposed on batteries, electrical goods, luggage – ware and textile and clothing

Source: Jenkins and Leape, 1998

Notes: Specific duties are additionally levied on a number of tariff lines.

In SACU the highest tariffs are on clothing (83%). Generally high tariffs are on finished products, while there are lower rates on raw material and capital goods. Under the GATT offer the highest rate will come down to 40% (for clothing and textile) and the new structure will follow a more clearly defined cascading structure with a maximum rate of 30%, except for key sensitive products.

Table 3.21**Tariff SACU reductions and timetable - GATT offer**

Commodity	New tariff (%)	Phase down period (years)
Consumer goods	20 – 30	5
Intermediate/Capital goods	10 – 15	5
Raw materials	0 – 5	5
Clothing	Max. 45	12
Textile	Max. 25	12
Assembled motor vehicle	Max. 50	8
Motor vehicle components	Max. 30	8

Source: Jenkins and Leape, 1998

In contrast to the external tariff structure of individual SADC countries one needs to examine the intra-regional tariff structure. An analysis of de facto tariff analysis is complicated by three factors. Firstly, multi-tier tariff structures, secondly, exemptions and excise tax which often have to be calculated as tariff equivalents and thirdly, other complementary economic policies such as the exchange rate and export subsidies which can influence the overall anti-export bias. There are also some concerns that there may have been policy reversal in some countries, such as Zambia and Zimbabwe in the past two to three years. This means that there may be fluctuations in the tariff levels of specific products.

3.7.2.1 Weighted Intra-regional Protection

According to Stahl (1997) most tariff rates in the region are not as high as people make them out to be. He defines free trade as trade

that is affected by a tariff of below 10% and is likely to be eliminated in the short-term. The bulk of SADC trade (some 70%) is intra-SACU where no tariffs exist. Overall intra-SADC trade flows amounted to US \$ 9.49 billion in 1995. He argues that a large part of the trade flows are subject to minimal tariffs. These are tariffs that are below 10% and are expected to become tariff free in the context of the implementation of the phased multilateral trade liberalisation schemes of COMESA.

This implies that intra-SADC trade that is tariff free adds up to US \$ 8.29 billion. Consequently, the value of intra-SADC trade facing "hard-core" tariff protection, in 1995, is estimated to have totalled US \$ 1.20 billion. In other words, hard-core tariffs account for the following:

- * 3.2 % of SADC countries' global imports
- * 14.9 % of intra-SADC trade (counting each SACU country individually)
- * 57.4 % of the volume of trade between the SACU and non-SACU SADC sub-regions (Stahl, 1997:7-11).

Malawi offers a 70% reduction on COMESA imports. Very few imports from the SADC countries come in at high tariff duties. 0.2% of SADC imports came in at a nominal duty greater than 30% and most of the SADC imports are concentrated at the lower end of the duty spectrum. 59.3% of all SADC imports came in at duty rates below 5%.

Prominent commodities coming in at very low duty rates are salt, sulphurs and earth (1.7%), cereals (0.1%) and fertilisers (0%).

Likewise, in the case of Mozambique, few SADC products come in at these high levels. Only 0.7% of Mozambique's SADC imports enter at duty rates in excess of 30% and 18.5% of Mozambique's imports enter the country at duty rates below 5%. The balance of imports from

SADC is spread amongst the other two digit categories although two chapters capture most of this trade. These are vehicles which have a duty rate of 6.9% and account for 24.5% of all SADC imports, and machinery which has a duty rate of 5.2% and accounts for 9.4% of total SADC imports.

Stahl (1997) shows that South African (or SACU) intra-SADC imports are subject to a range of tariffs. Although close to 37% of imports have a tariff rate of 5% and less, and close to 37% have a tariff rate of less than 10%, some of the products that may be important for African countries are subject to an ad-valorem tariff of around 30%. Two of the significant sectors where South African protection is high and of significance to SADC countries are in textiles and clothing- a sector that has been given a long phase out period in the WTO.

One of the problems is that South Africa has a fairly liberal regime toward Southern African countries in products that on balance do not really matter. In other words, there are no industries or no capacity in these countries to produce products for exports to the South African market that are less restrictive. However, sensitive products such as labour intensive manufactures and agriculture where tariffs in South Africa are relatively high are the very ones where Southern African countries have some trade potential.

This interpretation has to be read with some caution. It is precisely because of high tariffs in certain categories that these products contribute very little to total SADC intra-regional trade. In other words, trade patterns are simply distorted by the intra-regional tariff structure. These products in the region that are subject to high tariffs may have increased their contribution to regional trade quite dramatically in a scenario where their tariff levels were lower.

3.7.2.2 Multi-tier tariff structure

Many countries in SADC have a multi-faceted tariff structure. Apart from the MFN rate there is also the COMESA rate and in some other cases bilateral agreements add another tier of tariff rates to a specific combination of countries. A typical example would be a country such as Malawi. As shown in Table 3.22, there is a four-tier tariff structure.

Table 3.22

Multi-Tier Tariff Structure in Malawi

1. Full Rate	Base Rate
2. MFN Rate	5% points less than the base rate
3. COMESA Rate	Reductions across the board for all COMESA Countries
4. Bilateral Rate	Zero Zimbabwe Rate-

Source: adapted from Jenkins and Leape, 1998

These multi-tier tariff preferential levels also extend to a region wide level. For example, the percentage preferential reduction of intra-COMESA imports differ in countries from 80% in the case of Zimbabwe, 70% in Tanzania and 60% in the case of Zambia.

3.7.2.3 Excise tax and tariff equivalents

Another problem with tariff or protection analysis is the importance of excise tax. The case of Mauritius is relevant although this is an extreme example.

The present tariff structure applies 8 different rates ranging from 0% to 80%. An additional 20-percentage point is applied to non-preferential sources. The rates are however not classified according to

large categories of products. In some cases inputs are taxed at a higher rate than the imported finished products. The most common tariffs are 0%, 15% and 20% and the number of products subject to 80% is quite high and covers about 15% of total products.

Table 3.23

Tax rate applied to different categories of products: Mauritius

Products taxed at zero	Live animals, preserved foods, fruit and vegetables, raw material and other inputs for the textile industry.
Products bearing a tax of 5%	Medicaments, chemical products, machinery, paper and inputs for iron and steel products.
Products in the 55% and 80% range	Cars, spirits, luxury items and some products which are locally produced.

Source: adapted from Jenkins and Leape, 1998

The weighted tariffs indicate a very high variance around the mean of 21.8% and only 2.4% of goods enter the country at tariff weights exceeding 50%. Excise duties, which are applicable, both for local and imported products, sometimes have differential rates on imports. There are some differences in the way excise duties are calculated on imported and locally produced items which cause a discriminatory effect on imported goods and they therefore, constitute a charge of equivalent effect.

Tanzania applies excise duties to certain domestic and imported products and there are often differential rates applied to local products compared to imported goods with local products often being excise duty free. This therefore constitutes a charge of equivalent effect. Zimbabwe also has a surtax on finished goods.

3.7.3 The implications of the tariff regime for integration

There were two reasons for evaluating tariffs levels in SADC countries. Firstly, to demonstrate the difficulty of calculating trade diversion and creation, owing to both the exemptions and the multi-tier tariff structure. This poses particular difficulties to modellers, or even a basic Vinerian trade creation and diversion approach that requires information of tariff levels to estimate the change of price brought about by a tariff reduction.

Secondly, this kind of analysis also gives some idea about the significance of the tariffs. For example, the impact these could make to relative costs could be very significant. In general, it is clear from the analysis that in some cases external tariffs are high and this could be trade diversionary and may have negative welfare consequences for some countries. This is certainly a concern that non-SACU SADC countries have about importing from South Africa under a FTA.

Thirdly, tariff rates are still being phased out unilaterally. This means that lower unilateral tariffs can minimise both trade creation and diversion in Southern Africa. It minimises trade creation in the sense that tariff preferences may be narrowing but at the same time this may reduce the risk of trade diversion.

Fourthly, the intra-regional tariff barriers may be minuscule compared to NTBs. But, as was noted earlier, it is much more difficult to quantify a whole variety of NTBs.

These factors are critical to any model that attempts to measure the impact of regional trade liberalisation on trade flows. Fortunately, the theoretical model used in the next chapter abstracts from tariff levels.

The gravity model is less concerned with trade liberalisation than it is with long-run structural factors, as will be shown later.

3.8 Preliminary Descriptive Projections of Future Trade Potential

This section reviews some work estimating trade potential amongst Southern African countries based on uncomplicated techniques. The results are indicative. In some senses, this section is a precursor to the next chapter where a cross-section econometric gravity model is used to look not only at the potential for trade but also the main determinants of trade.

If the potential for trade creation in Southern Africa does exist, where or which sectors is it likely to come from? Some important research in evaluating trade potential has focussed on the agricultural sector showing that if there is a case for trade complementarity in Southern Africa than it certainly is in this sector. Koester (1992) shows that agro-climatic conditions in SADC prove that there are countries that are producing commodities that could economically be better nurtured in more suitable climatic conditions. Intra-regional trade in food commodities would reduce the annual variability on food supplies for the region. Moreover, the prevailing pattern of trade in cereals reflects comparative advantage due to transport costs rather than production costs (see Koester, 1992 and Weeks and Subusat, 1995).

Weeks and Subusat (1995) in a study looking at potential intra-regional trade, specifically in grain amongst COMESA countries show that there is greater potential for increased regional trade in grain. Their argument is based on the assumption that differences in consumption as well as differences in production patterns among countries in the region suggest that there is a basis for trade. In other words, countries could meet each other's shortages as well as absorb each others' surpluses.

Specific trade potential between South Africa and the rest of the region, in a post-apartheid, post-sanctions era has received much attention. Various studies have emerged to project what the potential for trade is and in which likely products. There is general consensus that there is considerable potential.

One study shows that there is considerable potential for the non-SACU countries to switch supply from third countries to South Africa. This implies that South Africa actually exports many of the products that the rest of SSA imports from northern countries (but not from South Africa). These assumptions are derived from looking at potential trade which is defined as the value of imports currently coming from the rest of the world for which at least one SSA country is making significant exports to the rest of the world (ADB, 1995). Using the same methodology, Mansoor et al (1993) show that potential intra-regional trade for SSA as a whole was \$4.5 billion, 16% of the regions total exports for the year.

More recent work in UNCTAD (see Table 3.24) shows that the potential for increased SACU imports from SADC in products such as iron and steel, clothing and cotton as well as other commodities, is considerable. While current SACU's imports from the SADC ³⁰ is valued at 402 million dollars, potential SACU imports from SADC is estimated at 8822 million dollars.

³⁰ The SADC 7 refers to non-SACU SADC countries, excluding new entrants such as The Republic of Congo and Seychelles.

Table 3.24

**Actual and Potential SADC - 7 Exports to SACU,
1995 Millions of dollars**

Product	Actual SACU imports from SADC - 7	Potential SACU imports from SADC - 7	Current main SADC - 7 exporters
Petroleum (SITC 33)	0.2	2775	Angola
Non - ferrous metals (SITC 68)	9.3	325	Zambia, Zimbabwe
Cement and diamonds (SITC 66)	15.0	264	Angola, Mauritius, Zimbabwe, United Republic of Tanzania
Iron and steel (SITC 67)	5.0	225	Zimbabwe
Cotton (SITC 26)	35.7	191	United Republic of Tanzania, Zimbabwe, Mozambique
Cotton yarn and textile fabrics (SITC 65)	20.7	158	Mauritius, Zambia, Zimbabwe
Clothing and accessories	27.9	139	Mauritius, Zimbabwe, Malawi, United Republic of Tanzania
Cocoa, coffee, spices, tea (SITC 07)	11.3	117	United Republic of Tanzania, Malawi, Zimbabwe
Meat (SITC 01)	4.1	97	Zimbabwe
Memo item: All products	402.2	8822	

Source: United Nations, (1998)

Note: Trade potential is calculated as the overlap between SADC - 7 exports to the rest of the world and SACU imports from the world.

More dis-aggregated data provided in Appendix 5 shows a range of interesting products where the trade potential of SADC countries to SACU is considerable. Some interesting product lines are tea, textiles, non-ferrous metals and clothing.

Indeed South Africa's potential in the SADC market is more obvious. As noted earlier, there has been sustainable growth in South African exports, specifically in manufactured products. It is often pointed out that one of the constraints that South African exports come up against is the small size of the SADC markets. Shares of South Africa's exports to SADC as a percentage of total non-SACU SADC imports are roughly 30%.³¹

This analysis identifies the overlap of those products exported by SADC countries to the rest of the world while simultaneously imported by SACU from the rest of the world. It provides a useful general map of the trade potential between two regions since it examines trade potential rather than actual trade, focusing on the potential for SADC (excluding Mauritius) countries to export to SACU. Products with growth potential are those that SADC exports in large amounts to the rest of the world while SACU imports them in large amounts from the rest of the world.

These results are quite revealing but it is important to take cognisance of the fact that this methodology is crude and at best provides some pointers as to potential areas of complementarities. What is naturally needed is a closer analysis of the actual products, whether they are good substitutes and how competitive they are. The main weakness of this methodology is that it implicitly assumes that all potential trade is realisable and that the very definition of unexploited potential trade implies that the expected or attainable value of intra-product trade is zero. Moreover, trade potential identified in this way can, only be a rough estimate because it is based on actual trade flows rather than on their determinants. Therefore supply capabilities in the potential exporting countries and market access conditions in potential importing countries have also to be taken into account (UNCTAD, 1998:204).

³¹ Based on own calculations on the basis of 1994 IMF direction of trade statistics data.

However, an important message emanating from these studies is that there is greater trade complementarity in Southern Africa than was previously believed. This is based on the fact that potential trade is higher than observed or official trade. An assessment of trade potential in SADC can be approached from various levels of sophistication. The most basic methodology was used above showing potential for greater intra-regional trade. As was noted, this methodology is somewhat crude and relies on many assumptions. The following section reviews more sophisticated attempts to look, not only at trade potential, but other economic variables such as output and employment.

4. MODELING THE IMPACT OF TRADE AGREEMENTS: STATIC MEASUREMENT PROBLEMS

One of the important issues raised in this thesis at the very outset was that recent theoretical developments offer a real temptation to discard static analysis in favour of dynamics. A concern that was raised in this regard is that it is exceedingly difficult to measure non-traditional dynamic effects. In many ways it is easier to model general equilibrium static effects rather than dynamic ones. As mentioned earlier, part of the problem with the dynamic effects of economic integration is that the gains are often very long-term. In other words a relatively distant time horizon is needed to capture the dynamic effects of integration partly because economic behaviour does not change from one moment to the next (Ebberts, 1995).

The measurement of the impact of integration depends, to a large extent on technique and methodology. The availability of data generally guides the level of complexity of the model that in turn influences the approach adopted. Common techniques used are mathematical partial to general

equilibrium simulation models on the one stream and econometric models on the other.

Although static effects are easy to measure they are by no means free of specification and measurement difficulties. This is specifically the case with multi-country general equilibrium effects. This section looks at some of the difficulties involved in measuring the static effects of integration beyond the Vinerian approach. It focuses on multi-country partial equilibrium (PE) and computable general equilibrium (CGE) models that attempt to measure the impact of integration on the economy as a whole. These so-called ex-ante analytical models are widely used in economic policy environments today.

Partial and general equilibrium models have been commonly used in simulating the impact of regional integration agreements.³² An important aspect of computable general equilibrium work is to look at the counterfactual scenario whereas econometric work is used in most cases to look ex-post at the effect of integration.³³ The gravity model as we shall see later on, although an econometric model, will be used to look at both the determinants of trade as well as potential trade under different conditions and scenarios. It is not really comparable to these models since it has a completely different focus.

This part begins with a critical review of the Evans model of integration. Evan's (1998) work is one of the few models that measures the economic impact of a likely FTA on the individual countries or the SADC region as a whole. It is a static, partial, multi-country model consisting of 27 sectors for eight of the twelve SADC countries. The model represents more than a Vinerian approach in the sense that it goes beyond measuring trade creation and trade

³² CGE models are an extension of applied general equilibrium analysis – the computational aspect allows a greater deal of complexity and detail (see Whalley and Shoven, 1984).

³³ Counterfactual refers to economy-wide effects or changes once you introduce a shock to the model such as a reduction in tariffs.

diversion. It measures the impact of a likely free trade agreement on output, trade and employment in individual member countries. The main thrust of the model is to capture some of the key characteristics of SADC countries such as excess capacity in the manufacturing sector and non-competing imports in intermediate and capital good sectors.

The Evans model has a very similar structure to a multi-country CGE model. It has, however, a less elaborate data set that precludes estimation of second round effects. There are some other initiatives in place to develop multi-country CGE models in Southern Africa. These are however in progress and still at the stage of completing social accounting matrices for each country in the region not leaving much scope for review. Hence the review of the Evans model will be followed by a discussion of some of the methodological difficulties associated with comparative static models, specifically general equilibrium ones and why this thesis has not taken, on board, this particular approach.

4.1 Multi-Country PE Models: A Review of the Evans Model

Evans develops a model that looks at the impact of a FTA in SADC on the economies of member countries. As mentioned, he goes beyond trade to look at employment and output.³⁴ The model also shows the likely impact on government revenue due to losses of income from import duties. His multi-country partial equilibrium approach is similar in structure to a CGE model. It is lack of data that precluded the use of a region-wide CGE model.

³⁴ I do not discuss the employment and output results from Evans as it is not of immediate concern except to acknowledge the welfare implications of measuring the impact of integration on trade include employment and output.

The structure of the model is such that supply is determined by the so-called Armington³⁵ rules for imports and domestic production. Imports and domestic production are regarded as imperfect substitutes and combined according to cost minimisation principles captured by functional relationships resembling the constant elasticity of substitution (CES) production function. Armington rules are also used to determine imports by source from SADC or the rest of the world. Demand is determined by price, exogenous income and exports from the rest of the world.

What the model attempts to do is estimate the impact a FTA would have on member countries. It does these under two scenarios. In case one it assumes a reduction in tariffs while everything else remains constant. In the second case, it assumes that the FTA is concluded with a 3% growth in the regions aggregate income³⁶. There are minor differences in the results from the two scenarios but the conclusions are broadly the same. These are as follows:

- the effect that the free trade agreement has on total demand is low
- the effect it has on imports into the SADC region as a whole is marginal since under a FTA the external tariff rates of countries remain the same or if these are reduced they are in keeping with WTO commitments.
- the overall impact of the FTA on employment is low although there may be specific sectors in the respective countries that may suffer.
- The FTA is likely to lead to trade creation of around 20%.
- A decline in revenue for some economies, which is somewhat predictable if tariffs come down.

³⁵ The Armington Assumption named after Paul Armington's (1969) work involves a particular specification where products are considered imperfect substitutes. These products are simply differentiated by country of origin.

³⁶ Evans also introduces ROW effects but for my purposes I limit my discussion and results to SADC effects.

As is clear from table 3.25 below, the percentage growth in SADC trade is 18% in the first scenario and 21% in the second scenario. Interestingly enough, countries with the highest growth in exports to SADC are, in decreasing order, Malawi, Mauritius, Zambia and SACU. What is striking is that SACU is likely to experience the highest growth in SADC imports at 42.5%. This would contribute to improving the balance of payments in favour of some non-SACU countries. The problem with the model is that it assumes high export supply elasticities and tends to exaggerate the supply response of most countries to trade liberalisation (see discussion below).

Table 3.25

Results of Evans Model with Long-Run Armington Elasticities

Percentage Growth in SADC Imports and Exports in a SADC FTA						
		No GDP Growth			3% GDP Growth	
		Imports	Exports		Imports	Exports
Angola		28.1	3.2		30.8	6.8
Malawi		13.7	44.8		17	47.1
Mauritius		6.4	30.8		9	33.1
Mozambique		11.4	17.4		14.7	20
SACU		42.5	19.9		45.4	23.2
Tanzania		9.4	10.4		12.7	13.1
Zambia		10.4	19.5		13.9	22.1
Zimbabwe		10.9	12		14.4	15.1
SADC		18	18		21	21

Notes: Sadc tariff 1996 tariff removed

Source: Evans, 1997

The Evans model has been re-estimated several times partly as a reaction to criticisms of the data and elasticities used. The re-estimated model shows marginally different results to the previous ones.

An extension of this table can be seen in Appendix 6. Despite the high growth in South Africa's imports from SADC under a FTA, the high trade surplus means that it would still enjoy a trade surplus of 24.6

billion Rand. Malawi's trade deficit is much less than actual (see previous section) under the simulation. The FTA leaves five SADC countries with worst balance of payments deficits in absolute terms from current values.

Another critical dimension to the model is the issue of the supply response and substitution elasticities. The model is aimed at capturing a flexible response to the changing relative prices of traded goods in response to a SADC FTA. It does this by introducing imperfect substitution between imports from SADC and the rest of the world and between all imports and domestic production.

The model assumes perfectly elastic supply functions within each industry. In other words, a one percent increase in demand will automatically result in a one percent increase in supply. It also uses standard elasticities to estimate substitution effects or to determine how readily firms in one country will substitute their imports from a trading partner for domestic production. The choice of the elasticities requires more attention as this can critically influence the model results.

The model assumed a greater than unitary elasticity of substitution between domestic demand and foreign demand for consumer goods and lower elasticities for intermediate and capital goods. Domestic production and substitutable imports have an elasticity of 2,5. Exceptions are for the intermediate and the capital goods sectors where imports from domestic production are substitutable with the elasticity of 0,5. Imports from the two sources i.e. SADC and the rest of the world have the elasticity of 2,5. The degree of substitutability is not only applied in all sectors but also across sectors. The model also assumes infinite supply elasticities- this implies that there is excess capacity.

The important question is how do these assumed elasticities influence the results of the model. Cattaneo (1998b:224) questions the elasticity assumptions of the model arguing that there is no real basis for some of the assumptions. She argues that in the consumer goods sectors, excess capacity assumptions, the assumptions of equal elasticity's of substitution between imports from SADC and the ROW and between imports and domestic production tend to exaggerate the likely trade creation effects of a SADC FTA.

Based on the logic of the model, in consumer goods sectors, the removal of intra-SADC tariffs should result in an increase in imports from SADC, a fall in import competing production and a fall in imports from the ROW. Given the assumption of equal substitutability between imports from the two sources and imports and domestic production, it follows that for sectors in which the initial level of import-competing production exceeds imports from the ROW, trade creation will outweigh trade diversion.

In intermediate capital goods, imports are complements to domestic production, so that import competing production increases when a FTA is formed. These sectors still exhibit trade creation effects, however, since there is still some substitution of imports for domestic production, although the effect is weak. However, the substitution effect between M_{si} (direction of change in imports from SADC) and M_{ri} (direction of change in imports from the rest of the world) is as strong as before so that in these sectors, trade diversion is likely to outweigh trade creation (Cattaneo, 1998b:214). Her basic conclusion is that the choice of elasticities leads to an over estimation of the effects of trade creation. For sectors operating at full capacity the supply response is also likely to be exaggerated.

Evans (1997b) in a subsequent paper, revised his estimates and performed simulations with short-run, medium-run and long-run

effects.³⁷ His results are given below and as we can see total intra-regional trade is presumed to grow at 6.5%, 9.5% and 12.5% respectively.

Table 3.26

SADC Simulation of a Free Trade Agreement (FTA)

	Short run		Medium run Armington elasticities		Long run Armington elasticities	
	Imports %	Exports %	Imports %	Exports %	Imports %	Exports %
Angola	6.28	2.38	9.16	3.78	12.03	5.19
Botswana	0.11	13.94	0.13	20.17	0.15	26.40
Lesotho	0.85	8.26	1.07	12.46	1.30	16.66
Malawi	19.46	22.35	28.07	33.47	36.68	44.60
Mauritius	8.85	45.62	12.39	69.33	15.92	91.05
Mozambique	17.93	31.75	26.05	47.80	34.18	63.85
Namibia	0.02	4.34	0.03	6.59	0.03	8.83
RSA	14.42	4.01	21.59	5.78	28.76	7.55
Swaziland	0.05	9.46	0.06	14.02	0.08	18.58
Tanzania	3.78	12.97	4.98	21.05	6.18	29.12
Zambia	14.23	36.11	20.79	53.05	27.34	69.99
Zimbabwe	24.41	21.75	35.92	32.61	47.43	43.47
SADC	6.48	6.49	9.51	9.52	12.54	12.56

Source: Evans, 1997.

The results show that the amount of trade creation is more sensitive to the differences between the short and long run estimates of the Armington elasticities and that the amount of trade creation is also strongly influenced by the size of the Armington elasticities³⁸ (Evans, 1997).

³⁷ Originally the Armington elasticities were estimated for the IDC for their economy wide computable general equilibrium model for the RSA. The basic estimates are intended to reflect short run changes in relative prices and they have been extended to cover all SADC. The short run Armington elasticities were increased by 50% to arrive at medium run elasticities and by 100% to arrive at long run elasticities.

³⁸ Armington elasticities are not a substitute for product differentiation.

As is clear from the Evans model, the impact of the FTA agreement in aggregate terms would be marginal, with an overall improvement in intra-regional trade and minimal effects on employment. These assumptions, however, need to be qualified in two ways. Firstly, these are results in aggregate and may hide away more negative effects at the individual country and industry level. As we can see there are some sectors that require specific attention in specific- member countries, specifically clothing and textiles.

Secondly, the model is essentially static by nature, partial equilibrium and assumes constant returns to scale. As a consequence dynamic effects can only be dealt with in a more qualitative fashion. The model can thus only be regarded as a sufficient, albeit important, indication of first round effects of the introduction of a FTA. Partial equilibrium models ignore the effects of changes in the price of a commodity on all other related market prices including the prices of factors of production. Policy changes in the sector modelled have no effects on the rest of the economy.

Evans, by his own admission, lists some of the limitations of the models that must influence the way the results are interpreted. Firstly, there is little increased utilisation of excess capacity or absorption of unemployed labour because the full macro income and expenditure circuit is excluded from the partial equilibrium results. Secondly the absence of scale effects or the effects of reinvestment of initial gains underestimates the size of the benefits (Evans, 1997).

An important caveat is that while it is naturally appealing from a policy making point of view to move from partial to general equilibrium models, there are indeed more risks being taken as one has to build on more assumptions and specifications in the model. In addition, the move from partial equilibrium to general equilibrium requires additional

data on the factor markets of the individual countries, input/output structures and a breakdown of final demand.

4.2 Implications of using PE/CGE Models

Multi-country CGE models have gained increasing popularity specifically within the context of new regional integration agreements such as NAFTA. These models typically provide policy support to governments looking at how integration is likely to affect, for example, the composition of industries in potential member countries, the changes in factor prices brought about by the changing composition and growth in one sector affects factor prices in other sectors in member countries. They are essentially comparative static models (Whalley and Shoven, 1984 and Benjamin, 1994).

These comparative static models are particularly useful when comparing relative changes and direction of changes of particular variables (labour, capital, output, etc) in response to certain shocks such as trade liberalisation (Benjamin, 1994). The main attraction of multi-country CGE models is their capacity to analyse cross-country effects or the effects on all the countries participating in a specific trade agreement. They provide a useful framework for assessing the impact of policies on resource allocation and who gains and who losses (Whalley and Shoven, 1984:1009). However, these models are highly sensitive to the choice of functional forms and the selection of parameter values.

An important component of trade-based multi country PE or CGE models is the specification of import demand or more broadly the treatment of the external sector.³⁹ Whereas in some models imports

³⁹ Moving from single country to multi-country model involves differences in import and export demand behaviour. In multi-country models, or world models respectively, production and demand are

and competing domestic goods are treated as perfect substitutes according to the Heckscher-Ohlin model, in others the Armington assumption of national or firm level product differentiation is employed. In the former, products are treated as homogenous perfect substitutes while in the latter case they are treated as different goods or imperfect substitutes (Koschel and Schmidt, 1997:3).

Although the Armington assumption allows one to address intra-industry trade, this is done by means of a perfect competition model which is not very satisfactory. Some models go beyond the Armington assumption which generally does not pick up variety at the firm level and use a monopolistic competition approach. Once again, firm level product differentiation requires data at a global level that is generally not available. Hence, many multi-country CGE/PE model stick with the Armington assumption (See Hertel, 1997).

The choice of specific functional forms typically depends on how elasticities are used in the model. A typical tendency in most models is to use constant returns to scale as captured in a homogenous production function or constant elasticity of substitution.⁴⁰ These functional forms impose discipline in the way resources shift between goods domestically, on the one hand and the way they shift between foreign and domestic goods, on the other. In addition, the models use transformation elasticities to determine the ease within which resources move from one sector to another. The parameter values for the functional forms are frequently crucial in determining the results of policy formulation. The specific choice of these parameters has an important bearing on welfare outcomes or trade potential for that matter.

specified for all countries participating in trade. All regions covered by the model are linked together by bilateral world trade matrices or trade pools (Koschel and Schmidt, 1997:p3).

⁴⁰ The CES function allows a significant reduction in the number of parameters that need to be provided in order to operationalise the model (see Hertel: 1997:40).

As we saw earlier that the results of these models are highly sensitive to demand and substitution elasticities. In other words, the intensity of substitution of imports from one source to another (trade diversion) will depend on the magnitudes of the elasticities?

An important reason why the magnitudes of these elasticities are important is there is a great deal of asymmetry in the ability to import amongst countries at different levels of development. In other words the income effect may not be the same in two countries at different levels of development (Benjamin, 1994:130-131).

Substitution elasticities play a critical role in determining relative price effects. They, like demand elasticities, determine the level of competition where higher substitution elasticities between each pair of suppliers means greater competition. Developed countries more than developing countries are more easily able to substitute between imports and domestic products and among various sources of imports (Benjamin, 1994).

Direct econometric estimates of substitution elasticities are rarely available in the literature, especially at the required sectoral aggregation level. In most cases elasticity estimates are based on guesswork. It is because of the difficulty of finding the right elasticities and acquiring detailed macro and micro data for individual member countries that the deployment of multi-country trade based CGE models become particularly challenging.

The main purpose here was to demonstrate that PE/CGE multi-country models that attempt to measure the economic impact of integration agreements are highly sensitive to a whole range of assumptions that are often out of sync with real world conditions. They are however, useful in measuring the likely internal distribution, or political economy effects of regional arrangements. These questions are important but premature in the sense that before we embark on an examination of the larger effects on integration we want to establish the grounds on which integration is viable in the first place.

CONCLUSION

An important conclusion reached in the previous chapter is that there is no direct or deterministic relationship between RI and non-traditional dynamic issues. There is however, a more systematic relationship between the size of the economy, level of development, trade potential and, to some extent, low trade barriers or transaction costs. This is borne out by the international literature showing that regions such as the EU generally have had higher levels of integration than less developed regions. Although intra-regional trade in SADC is not low by developing country standards, average trade flows are accounted for by a specific combination of countries with very little flows amongst least developed and small countries- like Swaziland and Lesotho, for example. In view of the link between these fundamentals and trade levels this chapter looked more closely at trade in the region.

The structure of the SADC economies has been examined showing that low growth and divergence and size constraints are some of the factors that render the prospects for integration less appealing. An additional issue that was looked at is to what extent does growth in one country influence growth in the other. By and large, the growth effects that one country can have on the other will depend on a range

of factors such as the size of the economy, the policy orientation (the level of openness) and the level of integration. The South African economy could possibly influence growth prospects of other countries significantly, depending on how integrated the smaller countries are with South Africa.

As far as trade creation is concerned we find that there is a mixed picture. In general, intra-regional trade in SADC is growing but this is specific to increased two-way traffic between SA and the rest of the region. While trade share and trade intensity measures give some idea as to how high or low intra-regional trade is, some model needs to be used to form judgements about whether a given level of intra-regional trade is high or low (see Foroutan and Prichett, 1993).

Some preliminary estimates of the potential for increased trade was given based on a relatively simple methodology. This showed high potential for trade. This was also confirmed by a more sophisticated approach- i.e. Evans multi-country PE model.

The previous chapter showed that even a simple straightforward Vinerian trade diversion and trade creation approach poses no real methodological problems but data challenges, stemming from the lack of consistent tariffs and the absence of appropriate elasticities of both demand and substitution effects. This chapter highlights some of the difficulties associated with more far-reaching static models that attempt to look at the impact of a FTA agreement, not only on trade, but welfare too by focussing on employment and output.

Although these models are far more telling about welfare, and hence an improvement over a simple Vinerian approach, there are some serious concerns about the appropriate specification and functional form of key behavioural and technical relationships in these models. In particular, different assumptions regarding the extent of firm level

economies of scale and different specifications of demand systems for differentiated traded goods can matter importantly for the magnitude of trade and welfare effects.

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CHAPTER IV

THE GRAVITY MODEL

1. INTRODUCTION

The main thrust of this chapter is to explain in detail the theoretical and empirical underpinnings of the gravity model and its major strengths and limitations, including some criticisms of the model. It begins with a review of specific applications of the model in the EU context and also in SSA.

2 ECONOMETRIC APPROACHES TO ECONOMIC INTEGRATION

A review of some partial and general equilibrium work was done in the previous chapter. In contrast to these models are the econometric ones. There has been a long-standing econometric tradition of measuring trade flows. Econometric work has been mainly used to examine ex post, the impact of integration on a number of variables, specifically trying to decompose the effects of trade discrimination or regional integration on the member economies.

The critical question normally associated with regional agreements is what would have happened if no agreements were in place - would trade still have increased or not? This is often referred to as the anti-monde or counter factual situation. Measuring the effects of integration necessitates the construction of such a fictitious anti-monde which represents what the world economy would be like if obstacles to trade had not been removed (Waelbroek, 1976:90).

In defining the effects of integration, the main function of econometric analysis is to isolate individual effects of integration from a range of

other effects. Part of the problem is that the integration effects pick up the effects of other factors - such as shifts in demand and supply due to changes in income and productivity, the natural development of trade flows, growth in income and global trade liberalisation (Ebbbers, 1995).

An important area of econometric work is time series export demand or supply functions. A large body of literature has developed, which looks at export behaviour in an aggregate sense (Goldstein and Kahn, 1985). This methodology has also been adapted to look at export behaviour between pairs of countries. In other words, calculating an export demand function based on geographical trade flows measuring export behaviour between a pair of countries or regions. The usefulness of this approach is that there could possibly be a high dispersion of trade elasticities when a country exports to different geographical markets. This is partly a reflection of different export profiles in different markets as we saw in previous chapter with South Africa's exports to Africa being different from her exports to the Row or the EU.

An export demand function, in econometric terms generally refers to exports regressed against a range of independent variables of which two important ones are a bilateral real exchange rate, the national income of the importing country and capacity utilisation rates. Included in these equations are a few additional variables and dummies that could also explain trade flows. These could be, amongst others, trade policy changes, regional integration agreements and changes in political factors. This kind of analysis is well suited to look at the short run export supply response of pairs of countries to discriminatory trade liberalisation. These short to medium-run analyses of export behaviour are important but require time series data that are generally very unreliable.

In contrast to a standard export demand function is the gravity model. Unlike export demand functions, in which relative prices are a major determinant of short-run export behaviour, the gravity model is a long-run generalised model that looks at the structural characteristics of the region to project trade potential.

Ex-post, models, attempt to estimate what effect integration has had on trade flows. The problem with ex post analysis is that it is not very useful for countries or regions with no history of market integration as is the case with SADC. The gravity model provides a useful way in which one can project future trade potential by using comparator regions with similar structural characteristics. This approach is well suited to the SADC region that is only now embarking on a FTA.

In most traditional models, the positive effects of integration are fairly small. However, more dynamic models incorporating factors such as increasing returns to scale and imperfect competition show much more significant welfare changes. The gravity model is fairly interesting in this sense. Although it is not overtly theoretical (see discussion below) and cannot directly look at welfare implications, it is fairly compatible with the assumptions of the more dynamic effects of integration. In other words, many of the important exogenous variables used in the model such as GDP, population and distance capture some important elements of more recent theories of trade. For example, the GDP variables of the importing and exporting country are compatible with their income and is in accordance with monopolistic competition which signifies product differentiation. The population variable is a proxy for size and therefore linked to the degree to which production is subject to increasing returns. Transport costs signify the degree of transactions cost (Martin, 1995:10).

Although the gravity model is considered a common ex-post method of decomposing the effects of preferential trade policy on trade flows, the

model can be used in varied ways. As we shall see later, the aim here is certainly not to decompose the effects of preferential trade policy in a direct sense but to infer what the main structural factors are that influence trade potential.

3. THE GRAVITY MODEL

The basic gravity model postulates that trade between two countries depends upon their GDP, population size and the distance between them. In variations on this single-equation model, other explanatory variables such as land area, and a range of dummy variables designed to capture factors such as a common border between two countries, cultural similarities as in a shared language, membership of a regional trading agreements and exchange rate effects (in terms of exchange rate variability and exchange rate misalignment), have been included.

The underlying rationale of the model is that the volume of trade between two countries depends on each country's trade potential and the trade-attraction forces between them. The model is referred to as gravity simply to capture factors that would induce countries to trade with each other. These factors are primarily three critical variables – the size of an economy, the level of development and the distance. Standard proxies for size, per capita income and distance are GDP, GDP per capita and actual distance between two countries, respectively.

The gravity model typically examines the direction of trade and variables such as GDP and population for both the exporting and the importing country. The basic idea is that the higher the GDP and GDP per capita of a country the more varieties of tradable products it is likely to have available for export. Thus it is clear why the GDP of both the importer and exporter govern bilateral trade: for the importer, GDP is a measure of income; for the exporter, it is a measure of

output¹. The final step is to assume that the price that importers face at any given variety of exported products rise with the costs of doing trade internationally (Baldwin, 1994).

In terms of the logic of the model, distance will be inversely related to the volume of bilateral trade. Distance is used as the proxy variable for resistance to trade which is composed of transport costs, commercial policy and imperfect information regarding export opportunities all of which may tend to become more meaningful with increased distance between countries. Thus the distance co-efficient is meant to have a negative value (Markheim, 1994:104/5).

Geographic size of the countries will be also inversely related to bilateral trade; the reasoning being that the larger economies trade proportionately less (not absolutely less). Exchange rate variability and exchange rate over-valuation are also expected to be inversely related to bilateral trade flows.

Table 4.1 below provides a snapshot of the main explanatory variables and the a-priori intuitive relationship they should have with the dependent variable.

¹ As noted, the apriori relationship between trade and gdp is not straightforward as trade orientation or intensity is sensitive to the size of the economy.

dummy variable for membership of a common arrangement appears with a positive coefficient, this indicates that two countries that belong to a preferential agreement, trade more with each other than is predicted by their income levels and distance. This would imply trade creation between the two countries. A negative co-efficient is taken as evidence of trade diversion vis a vis the rest of the world.

From an intuitive explanation of the gravity equation it is apparent that the model is especially appropriate to investigate flows of industrial goods taken to reflect the level of economic development. While the model is best suited to explain potential intra-industry trade, there is no empirical reason as to why it cannot be used to explain total trade potential (Wang and Winters, 1991).

As we will see below some authors have used the model differently by simply modifying single country variables as composite ones – either as multiplicative or subtractive. More specifically, the model has been used to investigate the extent of intra-industry trade and inter-industry trade between two countries. The Linder hypothesis suggests that countries with similar standards of living will attain higher levels of intra-industry trade where there is a broader range of product differentiation or goods to trade. On the other hand marked differences in per capita GDP (which could reflect differences in factor endowments) may be associated with a higher level of inter-industry trade (Elbadawi, 1995:8). Absolute GDP-differences are expected to vary inversely with levels of intra-industry trade. GDP per capita differences are highly correlated with differences in factor endowments and hence smaller differences could reduce trade especially comparative advantage driven by intra- industry trade (Foroutan and Pritchett, 1993:9).

The multiplicative form for GDP for two countries is a specification that comes from the theory of trade under conditions of imperfect

competition. This implies that trade between two equal-sized countries is likely to be greater than that between a large country and a small country. It should be noted that this multiplicative form of GDP does not take stock of the Heckscher-Ohlin theory of comparative advantage. However, the per capita income variable will capture the comparative advantage effect.

In sum many gravity models assume that a positive correlation between GDP per capita difference and size supports comparative advantage and a negative sign supports the Linder effect (Elbadawi, 1995). However, this may be attaching more value to the gravity model than it deserves. The model is not strictly speaking designed to explain comparative advantage behaviour amongst trading partners, but to explain in a 'structured empirical way' what determines trade. This thesis will use both composite and single country variables. The model will therefore not attempt to make firm conclusions about comparative advantage but rather it gives rough indications of what the composites may signify.

4. THEORETICAL ALARM BELLS

There are some theoretical issues that need to be dealt with, particularly in respect of notable criticisms of the gravity model. Two major criticisms have essentially been leveled against it. The first is that the model has a very weak theoretical structure. The second is that, as the model does not take relative prices into account it therefore suffers certain weaknesses. This section aims to deal with these criticisms and attempts to show why the model is still valid and useful, notwithstanding these criticisms.

4.1 Prices

One of the main criticisms of the gravity model is the absence of relative prices. The explanatory variables in the model generally omit relative prices (between local and international products or between trade and non-tradeable). The underlying concern is to what extent is high price variability amongst potentially integrating countries the result of gravity type determinants or trade policy distortions. In other words, high price differences amongst trading partners could be explained by high transaction costs, lack of trade complementary opportunities and other factors that account for high market segmentation amongst neighbouring countries.

Bergstrand (1989:480)), for example, argues that the model is not a well specified economic model because the equation explaining the trade volume is not derived from the optimising behaviour of economic agents, although some theoretical rationalisations do exist. His suggestion is that 'price terms, derived from underlying utility and production functions, importantly influence trade flows and lend behavioural content to the gravity equation.'

Naturally a major difference between gravity equations and export demand functions is the importance of changes in relative prices as a determinant of trade. Indeed this is relevant if the objective is to test how firms respond to trade policy changes in the short run. But it is precisely because of its long run nature that the gravity model does not require price data. The model is often referred to as a long run equilibrium view of trading patterns.

The gravity model analyses imports or exports for many countries at a single point in time based on cross section data and generally excludes price variables. This exclusion stems from the general equilibrium nature of analysis, in which prices are endogenous and

merely adjust to equate supply and demand. Moreover, the inclusion of prices implies that a country's price level determines its trade in way quite foreign to the tradition of barter models usually employed in long-run perspectives (Wang and Winters, 1991:4, 8). An added problem with using prices is some measurement difficulties. Finding internationally comparable prices for the range of countries and suppliers is extremely difficult.

4.2 Theoretical Construct

The gravity model has been treated with some degree of scepticism because it is considered to have a loose theoretical construct. The main concern is not that the gravity model has no theoretical base but rather that the model can be derived from a wide variety of varied theoretical bases. In other words it could be consistent with an Heckscher -Ohlin model with non-homothetic preferences as well as a model with increasing returns and product differentiation.

Deardoff(1995) argues that the reason as to why the gravity model has gained ascendancy in recent years has to do with its empirical success. The reason being that the premise of the model, that trade is dependent on income and distance, is obvious and is amenable to any sensible model.

The criticism that the gravity model is suspect in testing certain trade theories is simply misdirected. The model does not aim to confirm a particular trade theory. It merely aims to shed light on the main structural determinants of potential trade, as opposed to the generation of other models (Heckscher-Ohlin, increasing returns to scale), which aim specifically to answer why countries trade. Instead, the aim of the model has been to capture statistically the bulk of trade variation to discern the marginal explanatory power of trade patterns (Frankel, 1998).

After a wave of enthusiasm when the model was introduced (Tinbergen, 1962), the lack of credible theoretical foundations saw the waning of the popularity of the gravity model. More recently the model's respectability has been defended and it is currently enjoying renewed focus (Wang and Winters, 1991). Its revival is accounted for by its success in the prediction of bilateral trade flows and its strengthened theoretical foundations arising from its consistency with a range of structural trade models (Elbadawi, 1995). The interest among economists in geography and trade, which focuses on the spatial dimension of economies and regions, has further enhanced the appeal of the gravity model (Mukherjee and Robinson, 1996:18).

It is clear that the model's redeeming feature is that it has proven to be empirically robust. At the same time, one has to be modest about the conclusions that one can derive from it. According to Eichengreen and Irwin (1998) few aggregate economic relationships are as robust as the gravity model's ability to explain variation in bilateral trade flows across a wide variety of countries and periods. Rather than look at the model in strict theoretical terms it should be seen in terms of a norm. This norm is based on variables such as size, per capita income and distance (Hummels, 1998:219).

The gravity model is not aimed at testing a particular theoretical hypothesis as is the H-O or imperfect competition model. It is an attempt to generalize what specific trade patterns exist and not why they exist. This argument is borne out further by an empirical review of gravity model applications given below.

5. REVIEW OF EMPIRICAL WORK ON THE GRAVITY MODEL

There is a swelling literature using the gravity model, specifically to estimate potential trade in the European Union and Eastern Europe. There is also an emerging literature applying the model to developing economies; specifically Sub-Saharan Africa (SSA).

Wang and Winters (1991) use a gravity model to estimate the trade potential of Eastern European countries showing that Eastern European trade with market economies falls dramatically short, by one quarter, of its potential. On the basis of the gravity model they come to the conclusion that rather than accounting for a mere 7% of world merchandise trade, Eastern Europe and the Soviet Union should have accounted for 18%, even at current levels of income.

In a study of a similar nature Baldwin (1993) uses the gravity model to look at the potential for trade between East and West Europe in the medium-term where incomes are held constant at their 1989 levels. He then goes on to look at the long-term scenario where the incomes of the Eastern European countries catch up with their Western European counterparts. His conclusion is that in both the medium-term and long-term scenario, the potential exports and imports of West European countries to the East far outstrip the actual trade in 1989 (Baldwin, 1993:89).

Foroutan and Pritchett, (1993) apply the model in the classical sense by determining the direction of trade using variables to capture features of both the exporting and importing country. Applying the gravity model to Sub-Saharan Africa they come to the broad conclusion that trade amongst Sub-Saharan Africa countries is higher than expected and that the low level of trade potential is simply explained by low levels of GDP in the region. They follow a two-step procedure in their model. The first is to determine ex post what the

main determinants of growth in SSA are. The second is to determine ex-ante the trade potential of SSA, with the SSA countries excluded from the sample. Instead they use a comparator region and use the estimated co-efficients from this model to predict intra-SSA trade. These predictions are then compared with actual trade flows.

Foroutan and Pritchett's (1993:20) model includes 19 SSA countries and covers various regions beyond SSA for the period 1980-1983. They show that trade volumes increase significantly with a common border and fall off quite sharply with increasing distance. Trade also increases significantly with total output. Moreover, shared languages and trade preferences are also statistically significant. They use a series of interesting dummy variables to capture what they call 'specific SSA trade effects'. Using an African dummy when both the reporter and partner countries are African gives an indication as to whether African countries trade less with each other than similar countries do with their neighbours. The expectation that distance is a greater barrier to trade in SSA than in other regions, simply because of poor infrastructure, is disputed by their results. They conclude that infrastructure is no worse than expected, given the low trade potential. Interestingly enough, dummy variables for regional integration outside of SSA, such as the Association of South East Asian Nations (ASEAN), the Latin American Free Trade Area (LAFTA) and the Central American Common Market (CACM) are all significant in the model while integration dummies in SSA are insignificant. The one exception is the Southern African Customs Union (SACU).

Ogunkula (1994) uses the gravity model in the context of West Africa and shows that, income measured as gross domestic product, exerts a major influence on the recorded official intra-regional trade flows. In relative terms, income of the importers affects the total trade flows more than that of the exporter. The effect of the population of the importer on total trade flows is also positive and very important. He

also found that transportation costs are a major obstacle to trade in the region. Various other dummies such as adjacency and cultural similarity were also significant variables in the model. He concludes that the current value of intra-regional trade in West Africa is lower than the potential for intra-regional trade. Put differently, theoretical trade is higher than actual trade.

Mukherjee and Robinson (1996) use co-efficients from a gravity model estimated by Frankel *et al* (1996) to predict the trade potential of the Southern African region. The estimates show that for seven Southern African countries (with the exception of Angola and Mozambique) actual trade flows exceed the potential flows predicted by the model. They indicate that the potential for a free trade area involving relatively poor countries is significantly enhanced by linking to a richer country. They quote the examples of the Andean Pact and the Asean to support this contention and conclude that South Africa has an important role to play in the process of integration in the Southern African region. It can serve as an anchor for the other countries and drive the process of integration.

Elbadawi (1995) uses the gravity model to examine the determinants of intra-SSA trade, paying specific attention to the ex-post effects of regional integration schemes in SSA. His application of the model differs from Foroutan and Prichett (1993) in two ways. Firstly, his model does not look at the direction of trade but trade potential measured against the product of GDP and GDP per capita differences. Secondly, he uses additional innovative variables in the model. These are proxies for exchange rate variation and exchange rate misalignment that, as we shall see later on, do not make a fundamental difference to the results.

The Elbadawi model was estimated for a sample of 62 reporting countries of which 28 are from SSA, for two periods, 1980-1984 and

1986-1990. He extends the basic gravity model to include the effects of regional integration schemes in SSA and other countries, the trade diversion effects of these schemes and two channels of exchange rate effects, specifically exchange rate volatility and real exchange rate overvaluation (1995:4-5). Distance, economic size (as measured by GDP), cultural affinity and GDP-differentials are significant and have credible signs. Variables capturing trade creation and trade diversion effects of integration, real exchange rate variability and exchange rate overvaluation effects are small. His conclusion, controlling for the traditional gravity variables and exchange rate policy, is that the experience of regional integration in SSA has been a failure (Elbadawi, 1995:27-40). He does indicate that after adjusting for exchange rate policy, the performance of SADC improved across the two time periods under consideration, while that of other African blocs worsened.

One of the concerns with the Elbadawi model is that the dependent variable is calculated as either exports or imports and not total trade i.e. exports plus imports. The reason that the latter make sense is that most of the independent variables are in multiplicative form measuring the product of GDP between two countries or the differences in GDP per capita. In other words, US exports to Mauritius, for example, are subject to the same set of independent variables as Mauritius exports to the US. While not explicitly wrong the results could be biased.

Holden (1996:28) uses what she calls 'a variant of the gravity model' to assess the impact of the regional groupings in Africa and the lifting of sanctions on South African trade. One of the interesting variables that she uses is a dummy to capture the openness, or differences in trade and exchange rate policy, of South Africa's trading partners towards imports in general. She constructs this variable by regressing each country's share of imports from all sources in the gross domestic

product for that country on time dummies, and the natural logarithms of their gross domestic product and populations. The index of openness for each trading partner is then measured by the extent to which each country deviates from what would have been expected, given its level of per capita income and the size of its population. This measure captures the combined effect of both trade and exchange rate policy on a country's import share.

This model is estimated using South African exports to one hundred and thirty-six countries over the period 1989 to 1993. Her econometric results show that merchandise exports are positively related to gross domestic product and negatively related to population and distance. Most of the dummy variables play a minor role in the determination of the direction of exports. This implies that regional groupings had not influenced South Africa's direction of exports. Moreover, the impact of regional groupings on purchases of South African goods did not significantly change, despite the raising of sanctions (Holden, 1996:29). Estimating the model with South Africa's imports as the dependent variable, the model comes up with similar results as the case with export determinants. A country's share in world GDP is positively related to its share of imports in total South African imports, and the share of population significantly reduces a country's import share.

Holden's work is a useful contribution in explaining the determinants of South Africa's export success in the African market. It is a variant of the gravity model in as far as it incorporates some of the long-run determinants of trade potential such as GDP, population and distance. However, the focus is specifically an ex post analysis of South Africa's export success in the African market with specific emphasis on how trade arrangements, sanctions and some supply-side factors influence the direction of the country's exports (and imports) in Africa. Rather than looking at combinations of bilateral

trade flows amongst a whole range of countries, she looks at bilateral flows specifically between South Africa and range of countries without any flows amongst the other countries themselves. In the end, Holden's work hovers between an export demand function and the gravity model.

These different specifications are important in the sense that they attempt to measure different things. The implications of all these different specifications will be fleshed out in the next chapter with specific emphasis on what they signify and mean for policy.

6. THE RATIONALE FOR ANOTHER GRAVITY MODEL

Having surveyed a range of empirical applications of the gravity model including a series of models applied to SSA the important question is why develop yet another model and how will it add new insights into the policy discussions on Southern African regional integration above the current generation of models? The application of the model here is informed both by the appropriateness of the model and its specific form of application.

The model developed here will differ in several respects from the others. Firstly, it will use or deploy trade data in a very different way from most of the other applications. The data used in gravity models thus far has been drawn from the 1980s. This model will use average data from the period 1991-1994. It is also a period where major changes have been taking place in South Africa and increasing trade between South Africa and the rest of the region began to grow at a phenomenal rate from the early 1990s.

The gravity model makes fairly modest demands on data requirements, a particularly important consideration for a region riddled with data problems. Hence the model is well suited to the

Southern African region in as far as the data requirements are elementary. The analysis will be based on cross-section data for the average of the period (1991-4). The spirit of the model is a focus on the long-run determination of trade potential. Using a four-year average will mitigate the effects of wide fluctuations in exports or GDP in some countries that may have experienced commodity booms, or devaluation. This period is also significant as South Africa can be argued to have begun its process of democratisation and therefore the anticipation of a changing role for South Africa within the region may be perceptible during this period.

Secondly, the model has a specific Southern African or SADC focus. The Foroutan and Prichett (1993) model is the closest to what this model aims to do. However, they exclude many Southern African countries from their model. The Holden (1996) model on the other hand, has a specific South African focus and not a Southern African one. This model, as mentioned earlier, is not used in a conventional gravity sense. Its aim rather is to look ex post at the determinants of South African trade with other countries specifically those in Africa in a form that is closer to an export demand function as opposed to a long-run determination of trade potential.

Thirdly, the aim here is to use the gravity model to establish whether Southern African countries close to each other would engender a higher post-integration stimulus than integrating countries far apart, specifically with the developed economies? (Brad and Mended, 1985:551). Put alternatively, how effective would trade discrimination (or regional liberalisation through the establishment of a FTA in the SADC) be in stimulating intra-SADC trade. The model is well suited to answer this key question since it aims to show whether trade flows in the region are abnormally low, unusually high or fairly normal for countries of particular size and population.

Clearly all these studies come out with specific policy conclusions. Of specific relevance here is the SSA study. Foroutan and Pritchett(1993) stress that although intra-SSA trade is not below expectation, there is no reason why these countries should not be promoting further intra-regional trade since potential for growth exists. While the model used here may not necessarily dispute this claim, the policy conclusions may differ. An important area of inquiry is whether liberalisation of the SADC economy, either at the regional or multilateral level, will encourage intra-regional trade in Southern Africa. The hypothesis advanced here is that policy induced integration could be frustrated by structural limitations to the economies in the region. Indeed, in a world where trade barriers are coming down close geographical distance can play an important role in determining trade flows. In that sense, trade in the region is desirable if it is efficient and not characterised by trade diversion.

In summary then, the major contributions of this exercise are to estimate the model with a new data set, a new approach to the way the data is used, and exercise more caution by incorporating intra-SACU trade. It also runs a series of different types of estimations to derive more nuanced policy conclusions.

CONCLUSION

This chapter began with an explanation of econometric modelling in regional integration and explained why the gravity model was an appropriate vehicle of inquiry to determine both what the main determinants of trade are as well as to predict what the likely potential for trade could be under different scenarios for SADC. It was emphasised that despite some theoretical reservations about the model, it has proven to be consistently robust empirically.

There is a great deal of empirical work using gravity models. This chapter attempted to highlight subtle differences in the use of the model. The applications used in this thesis, as will be shown in the next chapter, focuses explicitly on Southern Africa, a new data set, and some different specifications.

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CHAPTER V

SOUTHERN AFRICA FOCUS: GRAVITY EMPIRICAL RESULTS AND ESTIMATIONS

1. INTRODUCTION

It was clear from the previous chapter that the gravity model can be applied in subtly different ways. These different applications provide interesting and distinctive perspectives on the determinants of trade. This chapter focuses explicitly on Southern Africa and specifications are chosen according to their ability to address the key questions of the thesis. A new data set is derived to enhance the suitability and accuracy of the modeling.

The chapter begins with a detailed discussion of the different specifications of the model in the Southern African context, explaining the rationale behind two main approaches. The major difference between these approaches is in the use of both the dependent and the independent variables. After an extended discussion of all the continuous and dummy variables in the model, the chapter goes on to examine data inconsistencies.

The chapter then moves on to estimate the models. The derivation of the structural parameters will be examined in two parts based on the two distinctive model specifications. The first part will estimate the model with composite (mostly multiplicative) variables. It will attempt to look at trade potential between partner countries and assess the impact of the product of the GDP of the two countries, per capita income differences and distance, amongst others, on medium to long run trade behavior. The objective is to test how difference in levels of development (Linder effect) and size affect trade potential amongst a combination of countries.

The second part will look at the direction of trade flows using a larger sample of countries and not just developing countries as is the case in the first set of estimations (see section above). Based on model 2, it will estimate the determinants of trade based on exporting and importing country variables separately. Unlike model one, single country variables are used here. In both parts SADC is the reporter region meaning that the sample of countries used in the model consists primarily of this regions' trade – i.e. SADC member countries trade amongst themselves and their major trading partners beyond the region.

The third part of this chapter then predicts ex-ante what trade is likely to be in the SADC region. The procedure simply involves determining the structural parameters for a range of specified exogenous variables based on a sample of countries other than SADC. The derived elasticities are then used for computing hypothetical trade flows. It uses a comparator region, as the control group. In this respect, two separate control groups are chosen – SACU and a set of Mercusor and Asean countries. In other words, some projections are made of what trade ought to look like, based on a sample of developing countries. Further projections are made based on a simulation of growth in the region.

2. APPLICATION OF THE MODEL IN SOUTHERN AFRICA

This section consists of a detailed discussion of the model employed here. It begins with a discussion of two specifications of the model and then moves on to explain the econometric method used, the sensitivity of the data and the variables. Specific attention is paid to data problems as well as an extended illustration of how intra-SACU trade will be incorporated into the model.

The model is broadly estimated in two ways – the composite way that combines both trading partners, and the separation of importer and exporter variables. Within these two approaches there are further differences in sample size and choice of countries that are outlined below. Moreover, the model may be estimated on cross-section data referring either to a single year or period of few years. The model is essentially cross-sectional and aims at testing the structural relationship amongst trading countries in different parts of the world. Although most of the models reviewed in the previous chapter use either a single year or pooling consisting of at least 4 years, the model here differs from both approaches. It averages out a 4-year period and estimates the model purely on a cross-sectional level.

• **Model 1 with Composite Variables**

The first model¹ below looks at total trade and includes the main gravity variables as composites. It was mentioned, in the previous chapter, that some authors wrongly try to derive comparative advantage from a model that is simply not equipped for this purpose. Despite this caveat a broad composite of variables can be seen as indicative of comparative advantage. It is in this spirit that this specification estimates the potential for trade based on composite variables and tells us how asymmetry in the level of development (differences in per capita income) and the product of market size of two economies (and population and area) influence trade potential amongst countries. The variables, all in logs, are as follows:

$$\ln T_{ij} = b_0 + b_1 * \ln (GDP_i * GDP_j) + b_2 * \ln |GDPPC_i - GDPPC_j| + b_3 * \ln (DIST_{ij}) + b_4 * (BA) + b_5 * (RI) + b_6 * (LANG) + b_7 * (ADJ)$$

where:

T_{ij} - is exports plus imports between country i and j

GDPPC -is per capita GDP

GDP_i*GDP_j - the product of gdp of country i and j.

DIST is the straight-line distance between countries i and j

GDPPC_i - GDPPC_j is the absolute per capita GDP differential between countries i and j

BA is a dummy variable, 1 if the two countries have a bilateral trade agreement, 0 if not

RI is a dummy variable , 1 if the two countries belong to the same regional integration scheme, 0 if not

LANG a dummy of 1 if the two countries have the same official language and 0 if they don't.

ADJ is dummy to indicate a shared border; 1 if two countries are adjacent and 0 if they are not

• Model 2 with Single Country Variables

Although quite similar to the previous specification there are some subtle differences here. Specific emphasis is given to supply factors in the origin and demand factors in the destination countries (Baldwin, 1994). The model is also better suited to project bilateral trade flows than the previous specification. The main objective here is to test how structural factors in both the exporting country and importing country influence trade potential and the direction of trade.

The model is specified as follows:

$$\ln T_{ij} = b_0 + b_1 \ln (GDP_i) + b_2 \ln (GDPPC_i) + b_3 \ln (GDP_j) + b_4 \ln (GDPPC_j) + b_5 \ln (dist_{ij}) + b_6 (ADJ_{ij}) + b_7 (LANG_{ij}) + b_8 (RI_{ij})$$

¹ Although I refer to model 1 and 2, these are essentially the same model with some variation in the

where:

T_{ij} is exports from country i to country j

GDP_i is the GDP of country i , subscript j indicates GDP of country j

GDP_{PC_i} is the GDP per capita of country i , subscript j indicates GDP per capita of country j

$DIST_{ij}$ is the straight-line distance between the capitals of country and country j

ADJ_{ij} a dummy variable, 1 if the country i and country j are adjacent, 0 if they are not

$LANG_{ij}$ a dummy variable, 1 if the country i and country j share a common language, 0 if not

RI_{ij} a dummy variable, 1 if both country i and country j belong to the same regional integration scheme, 0 if one or neither belongs

2.1 Data and Specification issues and Variables

Having introduced the two key specifications to be used, this section discusses the econometric approach used here and some of the data problems associated with using a Southern African focused gravity model. This is followed by a discussion of the important variables used in this kind of model.

2.1.1 Tobit Maximum Likelihood Estimation Procedures

In a classical regression, the assumption is that the dependent variable is continuous.. This is sometimes not the case in reality. It is inevitable in bilateral trade data, specifically amongst least developed countries in Sub-Saharan Africa, for example, there will be zero

values. There are two sets of problems with this. The first, is a statistical problem if the intention is to use logs to derive elasticities and the, second, is more of a conceptual problem.

The statistical problem stems from the fact that the log of zero is an undefined value. There are several ways in which this problem of a log-linear relationship can be solved. One of the ways is to discard the zero values from the sample. Although this will solve the statistical problem it compromises the economic analysis since important information may be embodied in those zero values. The second approach is to simply introduce small values for the zero values. It is here that the fundamental conceptual issue becomes relevant.

Another way of solving for the log of zero values is to forego a double log specification for a semi-log form in which trade is expressed in levels while the independent variables appear in logs. This allows one to utilise the information contained in the observations for which the observed value of trade is zero. However, OLS is no longer the appropriate estimator as the dependent variable is censored at zero. Under these conditions estimation by OLS will produce biased results and may predict negative trade flows (Greene, 1993: 683).

These econometric issues can be restated conceptually. Essentially some observations of the dependent variable, corresponding to known values of the independent variables, will reflect zero trade. However, zero is not just the missing information, it means no trade at all for existing ranges of the independent variables. Hence, replacing zero with small values solves some estimation difficulties but distorts the information the data is providing. Therefore it is likely to bias the results. If the dependent variable is to operate as an adequate index of trade potential this index should be allowed to span from minus infinity to infinity (Cassim and Hartzenberg, 1998). This would allow low potential to be symmetrically estimated with high potential.

Samples with limited dependent variables are classified into two general categories, censored and truncated regression models (Greene, 1993). Censoring occurs when we observe the independent variables for the entire sample, but for some observations we have only limited information about the dependent variable. Truncation, on the other hand, limits the data more severely by excluding observations based on characteristics of the dependent variable. As the SADC sample provides information on all the independent variables but not the dependent, estimation has to cope with censoring but not truncation.

When data are censored, the distribution that applies to the sample data is a mixture of discrete and continuous variables. If Y^* is the true index of trade potential, the sample data only reveals Y where:

$$Y = 0 \text{ if } y^* \leq 0$$

$$Y = y^* \text{ if } y^* > 0$$

Given the specification of the gravity model and the maximum-likelihood estimation procedure, the total change in the expected value of bilateral trade (T) can be disaggregated into two parts: first the change in T for those above the limit weighted by the probability of being above the limit, and second the change in the probability of being above the limit (Greene, 1993). In terms of the model, it means that bilateral trade may be decomposed into two parts: the change in the level of bilateral trade for those countries trading with each other, weighted by the probability of engaging bilateral trade, and second the change in the probability of trading with each other.

In summary, the approach used here is a Tobit maximum likelihood estimation method rather than an ordinary least squared (OLS) approach and a double-log specification, instead of semi-logs to directly derive elasticities. Apart from the specific econometric

approach used here, the results of the model are likely to be sensitive to the sample selection or country coverage. These issues are taken up in the next section.

2.1.2 Sample Selection and Country Coverage

One has to determine the country coverage for the model. This will differ for both the ex-post and the ex-ante parts of estimating the model.

In the case of ex-post analysis, an important choice that one has to make is whether to have a full sample of countries or a developing country sample on the assumption that countries with high GDP per capita may have different behavioural determinants to countries with lower per capita incomes. Different studies have adopted different approaches to country coverage. For example Foroutan and Prichett (1993) use a set of countries in the model that do not exceed GDP per capita of 3000 US dollars. The basic logic is precisely that the behavioural determinants differ for economies at high levels of GDP. Wang and Winters (1991), on the other hand, use a world sample and do not see any major flaw in using a full world sample. Cassim and Hartzenberg (1998) estimate the model with a developing country sample of countries not exceeding GDP per capita of US\$5000. This threshold is arbitrary. In sum then, the literature tends to suggest that there is no hard and fast rule about the sample range except to acknowledge that it could influence the significance and the magnitudes of the co-efficients. Therefore sensitivity tests should always be carried out to look at how sample selection biases the results. These tests are carried out later on in this chapter.

The model used here looks at bilateral trade flows amongst all SADC countries, as well as flows between SADC countries and the EU (all member countries) which is the largest trading partner of SADC. The

sample is broader than the Cassim and Hartzenberg one in as far as it includes intra-EU trade. The idea really is to determine whether the results would differ in any significant way by including a larger world sample. As we shall see, the results do not differ significantly.

2.1.3 Comparator Region to Predict Trade Flows

As was noted earlier the gravity model focuses on the long-run equilibrium nature of trade and is widely used to predict potential or theoretical trade. Normally a comparator region, as a control group, is used to predict trade potential.

The idea is to choose what is considered to be a normal trade block in the sample that does not include the particular regional arrangement being considered. The principal reasoning in choosing a comparator trade block is to determine by what magnitude intra-regional trade would change if it replicated some of the characteristics of the normal trade block. In other words, would it be lower or greater than observed trade.

A second major reason for including other countries derives from the fact that, prior to the formation of the trading block, members of the regional trade blocks had not only been trading with themselves but also with other countries. With a regional block in existence, the historical trade-flow data prior to the formation of the trading bloc is used to estimate the post-integration trade flows of the region (Ogunkulo, 1994: 25).

In order to have an ex-ante study it is important to ensure that a comparator region is found such as Mercusor or SACU. The EU would not be an appropriate comparator since most of the intra-regional trade is intra-industry whereas intra-developing country regional trade takes the form of inter-industry trade. The model will use two

comparator regions to estimate trade potential. Firstly it would consist of a sample of developing countries such as Asia and Mercusor where trade levels are higher than in SADC. Secondly, it will use SACU.

2.1.4 Explanatory Variables

Two critical variables in the gravity model are distance and income. The choice of the right proxy to measure these effects merits some discussion.

2.1.4.1 Distance

The distance variable has generated much discussion, partly because it is meant to capture, not only transportation costs but the overall transaction costs of trade too. There are various ways in which distance could be captured. The most obvious approach is to use road, rail, and sea or air distances in the model. An important question is what measure of distance most accurately reflects the real transaction costs of trading?

The underlying rationale is that such costs should rise with distance. Bayoumi and Eichengreen (1995), make the distinction between economic and geographic distance. The problem is that distance as a geographical concept may not be an accurate reflection of transaction costs in certain instances. For example, the transaction costs of goods from South Africa to Europe may be lower than that between Tanzania and South Africa even though distance in the latter case may be a third of the distance between the EU and South Africa.

The complexity of what to use as a proxy for transactions costs is compounded by the all-encompassing nature of these costs. Transaction costs refer to costs in obtaining information, the cost of bureaucratic processes involving government regulations and the

costs of financing the transactions depending on how efficient and developed financial institutions are in specific countries. In developing countries there is the added risk of payment defaults.

Wang and Winters (1991:12) use direct rail or road distance in their gravity model for African countries. They point out that for Africa, road communication is quite poor, so that although road distance between economic centres of respective countries is much shorter than the nautical distance, the cost of overland transportation is probably higher than the cost of sea transportation. According to Jebuni (1997:367) transportation costs in Africa are high in both relative and absolute terms. Lack of shipping services forces firms to use road and in some cases rail as the mode for transporting goods. This makes the absolute costs of trading high. One implication of this is that only high-value added goods are traded. In addition, the cost of trading intra-regionally might be higher than that of trading extra-regionally.

A more nuanced approach to finding the best proxy for transportation costs in Africa emanates from the work of Ogunkola (1994:29-30). He argues that the cost of transportation differs not only from trader to trader and time to time, it also varies with the composition of merchandise, weights and volume. In view of this problem, he introduces parcel express services, as an indicator of transportation costs. However, he shows that there is a high correlation between transportation costs and distance. In other words, transportation costs and distance are substitutable. He invariably comes to the conclusion that gravity models that employ distance as a proximate variable for transportation costs may not be all that biased.

The question really is what the best proxy for transportation costs in Southern Africa is likely to be? In Southern Africa it makes sense to use rail or road as a proxy for distance since most trade flows go

through these channels. Despite the robustness of the distance variable in most of the models reviewed in the previous chapter, transportation costs represents only a component of total transaction costs.

Trade flows amongst African countries require specific attention as both the transport costs and the transaction costs are particularly high. This has to be born in mind in the model developed later on.

Yet despite concerns about its accuracy as a proxy for trade-transactions costs, this variable, almost irrespective of how distance is measured, tends to perform well as a predictor of bilateral trade. This study will use straight-line distance between the capitals of the two countries as a proxy. This is calculated from a standard map of the world constructed to scale. The appropriateness of this proxy in the case of the Southern African region may be questioned, but for lack of data on factors, which would more closely capture the trade-transactions costs between these countries, no alternatives will be included in the study. One of the ways of making more sense of the distant variable is to complement the econometric results with more qualitative information.

2.1.4.2 Income

The regular source for GDP data is the World Development Report, which is also used here (World Bank, 1992-6). It is also important to note that measures of income in Southern Africa, specifically in countries such as Mozambique, understate the promotion of economic activity and trade owing to the large percentage of informal activities.

One of the difficulties of measuring economic size across countries is that exchange rates appear to deviate from the values implied by the relative prices of goods, and it is unclear whether output should be

measured in terms of the official exchange rates or their purchasing power parity counterparts (UNCTAD, 1998).

Market rates fail to properly reflect the purchasing power of domestic goods among economies. Purchasing power parity rates provide a better measure of relative standards. Hence the GDP values used here are based on purchasing power criteria. This is specifically important for developing countries that typically suffer from wide fluctuations in the official dollar exchange rate.

2.1.5 Dummy Variables

Dummy variables are used, amongst other things, to capture ex-post the effectiveness of trade agreements. For example, if one finds a positive co-efficient of a dummy variable indicating two countries are in a preferential agreement, this implies that the agreement is trade creating. Similarly, a negative co-efficient implies trade diversion (Bayoumi and Eichengreen, 1995:2).

One of the concerns that Bayoumi and Eichengreen raise is that the co-efficients on dummy variables for sub-groups of countries will pick up all respects in which those countries differ in their trade performance that are not controlled for by the gravity equation. They argue (1993:3) that if all countries in a region share a common language this will tend to spuriously attribute the effects of shared language in encouraging economic links to commercial policy measures. In other words dummy variables for preferential arrangements serve as a catch basin for omitted factors. This is partly solved by the fact that major variables remain more significant than dummies. Moreover, the inclusion of dummies for language and common border will reduce the size of the catch basin.

A dummy will be used to indicate the existence of bilateral trade agreements, 1 to indicate the existence of a bilateral trade agreement between counties i and j , and 0 if not. Another dummy will take account of membership of a regional integration scheme, 1 if the two countries belong to a common scheme and 0 if they do not. Cultural affinity will be proxied by a shared language and adjacency will be reflected in a dummy for a shared border.

2.1.6 Trade Data and the Dependent Variable

Some discussion has centred on whether to use import or export data to measure bilateral trade. Elbadawi (1995:14) argues that, in principle bilateral trade flows (whether imports or exports) should be influenced by the same factors. Foroutan and Pritchett (1993) do not agree, arguing that import patterns are likely to be determined differently from export patterns especially when considering gross as opposed to net flows. They argue further that in the case of SSA using both imports and exports will assist in remedying the problem of unrecorded trade. Unrecorded trade in SSA, and also in the SADC region is a particular challenge in the estimation of trade potential as compared with actual trade. Unfortunately, it is extremely difficult to incorporate informal trade into the model.

As far as trade data is concerned, a critical issue has been the lack of disaggregated data within SACU. This has raised a number of important questions as to whether SACU should be dealt with as a whole or whether data for individual countries is necessary. Cassim and Hartzenberg (1998), argue that the model can be justified on the basis of SADC intra-regional trade with SACU as one entry if the focus is on trade potential between SACU and the rest of SADC. South Africa accounts for more than 95% of SACU's exports and imports. We can therefore make reasonable estimations from SACU trade data. In other words, other SACU countries are simply assumed away in the

analysis. This is a plausible assumption implying that all is not lost if the analysis has to be conducted in terms of SACU aggregates.

However, the first best scenario is to disaggregate SACU data and this thesis puts considerable effort into estimating intra-SACU trade in order to incorporate the individual countries of SACU into the model sample.

Attempts to disentangle geographical trade flows from independent countries within SACU is exceptionally cumbersome since some trading partners of SACU member countries record their trade on the basis of a breakdown of individual countries within SACU while others treat imports or exports from SACU as one, without distinguishing one member country from another. However, despite these problems estimates were derived of intra-SACU and extra-SACU trade for the average period 1991 to 1994.

These calculations firstly began by looking at all the mirror data of countries importing from individual SACU countries.² The approach used is to calculate the shortfall between the countries total recorded exports and recorded imports (excluding those to SACU) based on mirror data. There are likely to be marginal differences since the mirror data are calculated on a c.i.f. basis and the total export figures are calculated on a f.o.b. basis.

The IMF direction of trade statistics was used to trace all countries in the world that document their imports from any of the BLNS countries. Appendix 7 shows all the possible countries that could be found that record imports from BLNS countries. The table has included trade combinations with 0 values to illustrate cases where there is no recorded trade.

² I have, where possible, consulted individual countries such as Botswana and Lesotho to make comparisons and adjustments.

The next step is to add up the total exports, as reflected in mirror imports, of the BLNS countries from Appendix 7. Total exports are show in Table 5.1.

Table 5.1

Total BLNS Exports: Average 1991-1994 US\$ million

Total Exports						
		1991	1992	1993	1994	91-94Avg
Botswana		1903	1725	1725	1880	1808.25
Lesotho		67	109	134	143	113.25
Namibia		1250	1290	1291	1322	1288.25
Swaziland		611	664	722	798	698.75
South Africa		23300	23600	24100	25100	24025

Source: IMF Direction of Trade Statistics, 1992-1997

Naturally there is a shortfall or difference between the exports calculated on the basis of the IMF data and the total export figures given by individual BLNS countries. Part of the problem is that some of the importing countries may record their BLNS imports as South African imports. However, since, a large part of their exports go to South Africa the shortfall simply implies that the remaining trade is intra-SACU (see Table 5.2).

Anomalies arise in the case of Botswana and Lesotho. In the former, the inclusion of its exports still leaves a high shortfall. This has to do with diamond exports, which either go to London or Switzerland, and this has been accounted for. In the case of Lesotho, South Africa's exports added to the calculated exports exceed the total recorded export value. This is probably accounted for by highly in-consistent-data recording. All of the BLNS countries' exports and imports are overwhelmingly with South Africa. In general close to 95% of total intra-SACU exports and imports were allocated to South Africa, while the rest were divided equally amongst the BLNS countries.

Table 5.2

Estimating Intra-SACU

TRADE 1million US

	Calculated	T. Exports	Shortfall	SA Exports	SA Imports
Botswana	262	1808	1546	2507	255
Lesotho	80	113	33	804.4077	143
Namibia	368	1288	920	1035.507	1,158
Swaziland	262	699	437	560.1469	400
South Africa		24025			

Sources: IMF direction of trade statistics, IDC Statistical Surveys of National Governments, etc

Notes:

The first column is based on calculations of all countries reports imports from the BLNS counties.

The second column looks at total exports of BLNS to evaluate the shortfall.

The high shortfall in the case of Botswana has to do with diamonds, the direction of trade is often

Meaningless since a large part of trade goes through London or Switzerland.

The right hand side bloc gives actual SA's export and imports based on IDC (1994) data.

All data is average 1991 - 1994. Data entered in the model is the average of the calculated and IDC data.

3. EMPIRICAL RESULTS AND ESTIMATIONS

The computer software used to estimate the Tobit model is LIMDEP. Given that this model is non-linear, an iterative procedure has to be used. LIMDEP uses Newton's iteration procedure in its maximum-likelihood (M-L) estimation. In general most of the explanatory variables show higher levels of significance, when using the Tobit approach as opposed to OLS regressions.

3.1 Estimating Direction of Trade with Composite Variables

Following the estimation of model 1 above, the estimates reported in Table 5.3. The table reflects the estimates of three different equations. All three are based on model 1 but differ in minor ways. In 5.3a and 5.3b the dependent variable represents a one way or single direction of trade. The difference between the two is the exclusion of certain dummy variables in 5.3a while most of the dependent variables are in composite form. This will test how the inclusion (or exclusion) of dummies influences the main parameters. In table 5.3c, on the other hand the independent variable is also a composite consisting of a two-way direction of trade, i.e. the sum of exports plus imports.

The independent variables in these three equations are the differences in the GDP of the combination of trade partners, the multiplication of GDP, differences in per capita income, distance,

Table 5.3³**Model with Multiplicative Variables and Developing Country Sample⁴**

Variable	a. Exclusion of Dummy Variables	b. All Variables	c. Dependent Variable is the sum of X + M.
Constant	-7.7040	-6.8342	-6.1157
$\text{Log} GDP_t - GDP_{t-1} $	-0.64177*	-0.63165*	-0.53565*
$\text{Log}(GDP_t * GDP_{t-1})$	1.0288*	0.98728*	1.0177*
$\text{Log}[GDPPC_t - GDPPC_{t-1}]$	-0.15785	-0.14762	-0.6351
$\text{Log}(DIST_{it})$	-0.39287*	-0.49320*	-0.78568*
ADJ_{it}	-0.14867	-0.14896	0.828
$LANG_{it}$	1.0401*	1.0631*	1.0768*
$\text{Log}(POP_t * POP_{t-1})$	-0.14477*	-0.12756*	-0.12756*
$\text{Log}(AREA_t * AREA_{t-1})$	-0.25404*	-0.23944*	-0.15403*
MERC		-0.14300	-0.15300
ASEAN		0.14346	2.2185*
COMESA		-0.99940*	-0.13241*
ISLAND		0.37751	0.4259*
SACU		0.64280	

Notes:

i) significant at the 5% confidence level

ii) – Estimated Equation - $\ln T_{ij} = b_0 + b_1 * \ln (GDP_t * GDP_{t-1}) + b_2 * \ln |GDPPC_t - GDPPC_{t-1}| + b_3 * \ln (DIST_{ij}) + b_4 * (BA) + b_5 * (RI) + b_6 * (LANG) + b_7 * (ADJ)$

³ All tables in the text are reproduced in the appendix 8 with actual T-stats, number of observations and log-likelihood tests.

⁴ This estimation consists of a developing country sample following Cassim and Hartzenburg (1998). For a fuller discussion of this see section above – ‘Sample Selection and Country Coverage.’

language differences and the multiplication of population and area. As was noted in the previous chapter, this specification is indicative of comparative advantage. Specific emphasis is put on the word 'indicative' in the sense that the model is not designed to determine comparative advantage. Some broad judgements about patterns of trade can, however, be made from it.

It is clear from model 5.3a that the significant variables are the product of the GDP of two countries, the per capita income (GDPPC) difference and distance. Interestingly enough the Linder effect, as captured by the differences in per capita income, has the correct sign, indicating that the higher the differences in per capita income the less the countries will tend to trade with each other.⁵

Differences in size, as reflected in the difference in GDP, provide rough indications of inter-industry trade or trade based on relative factor endowments. Elbadawi (1995:221) concludes that the use of the gravity model shows that trade in the SSA region reflects inter-industry trade. He shows that the sign on his co-efficient of per-capita income differentials supports the traditional comparative advantage effect of trade, and not the Linder intra-industry type source of trade. The aim here is not draw as firm a conclusion as Elbadawi does, but to suggest that the results are similar to his, broadly showing signs of inter-industry trade.

Land area is often used in gravity models as a proxy for endowment of natural resources of a country. The multiplication of the area of the two countries is significant but has a negative sign. This may be intuitive in the sense that the larger the region the less the tendency to trade, particularly, if both countries in

⁵ Linder suggested that countries at similar levels of development tend to trade more with each other than with countries disparate levels of developments.

the region are resource-intensive. However, the appropriateness of using a country's total land area as a proxy for its endowment of natural resources is debatable. For example a square kilometre of desert cannot be equated with the same area of fertile soil (Mayer, 1997).

Also interesting are the sizes of the co-efficients with the product of GDP of the two countries having the highest elasticity of 1.03 implying that a 1% increase in the product of the two countries will increase trade by more than 1%. The difference in size (subtraction of the two GDP's is the second highest elasticity with a co-efficient of -0.64. Hence a one percent increase in the difference in size of the economy say for example, from R1 billion to R1.01 billion decreases trade by 0.64 %. The third highest co-efficient is distance showing that a one unit increase in distance (in our case a 1 km increase) decreases trade by 0.4%.

In model 5.3b, dummy variables are included to determine how their exclusion in the previous estimation biases the estimates of the main parameters. The co-efficients are more or less the same except that the distance co-efficient is higher (-0.49). On the other hand, the co-efficients of the other main variables such as the product of size and difference in per-capita income are marginally higher in 5.3a.

Most of the dummies capturing regional arrangements are insignificant. What is very interesting about the COMESA dummy variable is that it is insignificant and has a negative co-efficient, implying the lack of significant trade creation or trade diversion effects. In contrast, Cassim and Hartzenberg (1998) show a positive and significant co-efficient for COMESA in their results

(see below)⁶. In other words, the existence of COMESA as an institution has had a positive effect on regional trade.

The above equation is re-estimated to determine trade potential with the dependent variable now expressed as the sum of exports plus imports. As was noted at the start of this chapter, the independent variables reflect the product or differences of pairs of countries and this measured against a unilateral direction of trade could bias the results. Having a composite dependent variable in a model with composite structural variables may better reflect trade potential, or be more reliable than using just exports or imports. Re-estimating the third equation (5.3c) tests the sensitivity of the estimated co-efficients to the choice of unilateral versus bilateral dependent variables.

Interestingly enough, estimating the equation with the dependent variable as the sum of exports plus imports, produces similar results to the previous exercise although both the coefficients and the t-ratios are higher on average. The distance co-efficient is much higher and the product of the population of the two countries is significant here but has a negative sign. This indicates that the larger the joint population the less the tendency to trade. A strikingly significant dummy variable with a high co-efficient is language barriers (an elasticity of more than 1) implying that countries that do not speak a similar language are likely to trade at a substantially lower level than countries with similar languages. The fact that the co-efficients in column c vary significantly from those column a and b demonstrates the importance of the dependent variable in the model.

Generally, what is clear from an analysis of trade potential is that the main determinants of trade amongst countries are size of the

⁶ This is explained more fully later on.

economies and the distance between them. Other factors, such as language barriers are also a significant deterrent to trade.

Although the results here are similar to some of the comparative literature (see Appendix 9) in terms of the signs and relative importance and significance of the co-efficients there are some notable differences in the magnitudes. Both Foroutan and Prichett (1993) and Elbadawi's (1995) results have very high co-efficients for distance in the range of 1.8 to 2.1 compared to the results in table 5.3 and in table 5.5 below. These were based on a similar estimation of distance as is used here.

There are two ways in which the approach here differs from these approaches and this may explain why their distance co-efficient is more robust. Firstly, both cover earlier time periods where distance as a deterrent to trade may have been more significant. Secondly, they use both time series and cross section data in the form of pooling while the model here uses multi-year averages. Their results may pick up short to medium run effects whereas my model explicitly looks for long run structural effects.

3.2 Estimating Direction of Trade with Single Country Variables

The second estimation exercise is based on model two. The model is estimated on the basis of single country variables. The advantage of this specification, over the previous one, is that it distinguishes structural factors in the exporting country to those in the importing country. This makes it possible to test and compare the relative importance of GDP or per capita income and other variables in the origin and destination countries.

The model is estimated with, firstly, a developing country sample and then a world sample⁷. In other words, the GDP, population and areas of both the importing and exporting country are entered as separate explanatory variables. Like the previous model there are few standard dummy variables such as a dummy for adjacency, a common language (taking on a value of 1 if the two countries share a common language and for regional integration arrangements (SADC; Asean, Mercosur, COMESA).

The Model with the Developing Country Sample is based on work done by Cassim and Hartzenberg (1998). The results are given below in table 5.4.

All the traditional gravity variables are significant in explaining bilateral trade flows here. Income levels of the importing and exporting countries both have the expected positive sign, the contribution of the exporting country's GDP is however slightly larger than that of the importing country - indicating that GDP, as the ability to export, is slightly more important here. Distance has the expected negative sign and language, carrying a relatively large coefficient, influences bilateral trade flows.

⁷ See section on country coverage in the previous chapter for a discussion of the choice of the two samples

Table 5.4**Developing Country Sample with Single Country Variables**

Variable	Coefficient	t-Ratio
Constant	-10.721	-15.326
Log(GDP _i)	0.96231	19.181
Log(GDP _j)	0.716	15.349
Log(dis _{ij})	-0.50865	-4.494
ADJ	-0.21745	-2.18
Lang	0.9063	6.094
SADC	-0.20404	-0.675
Mer	-0.148	-1.334
Asean	0.97009	3.33
COMESA	1.1686	4.224
Log(POP _i)	0.27275	4.075
Log(POP _j)	-0.52212	-8.597
Log(AREA _i)	-0.27677	-6.478
Log(AREA _j)	-0.19497	-6.079

Source: Cassim and Hartzenberg, 1998

Adjacency as in the previous estimation has a negative sign – this is contrary to expectations. In other words, the closer the countries, the more likely they are to trade with each other. However, if there is no complementary between two adjacent economies than there is no intuitive reason why the adjacency coefficient should be positive.

As mentioned in the previous chapter the population variables are utilised as a proxy for market size. In table 5.4 the population of the exporting country has a positive sign while the population of the importing country has the expected negative sign. This is

contrary to expectations.⁸

The problem with the population variable is that larger economies with extreme population sizes such as India, China and to some extent the USA would be more autarkic than smaller economies such as Botswana or Lesotho. This is compounded by trade policy distortions where small populations may be less autarkic but more inward looking. In other words, small non-diversified economies trade more of their output than larger diversified economies, purely because of the constraints of size, but may still have protected trade policies. Then, there are a series of middle-sized countries that are not as sensitive to a relationship between the population and openness. All these factors can easily distort the population variable and the sign of the co-efficient in the estimation.

Markheim (1994:105) argues that more populous countries are assumed to have greater endowment of resources thereby allowing broad productive activities that in turn satisfy a greater proportion of domestic demand, whereas small countries tend to specialise in production and are more reliant on imports. Hence the smaller the population of the exporting countries the greater the likelihood of trade relative to its total income. From this angle the signs of the co-efficients are intuitive. However, at another level, the negative co-efficient on the population of the importing country may be contrary to expectations – since a large importing country should promote trade as a larger population facilitates the division of labour and a variety of production lines that consequently provide opportunities for foreign goods to be incorporated into the production process.

⁸ See table 1 in the previous chapter for an explanation as to why the population of the exporting country should have a negative co-efficient and the importing country a negative one as opposed

Area, for both exporting and importing country, has the expected negative sign, indicating that larger countries are less likely to trade than smaller ones. Although the coefficients are not very large, they are significant. Economic size, on the other hand, as measured by GDP, is more sensitive to trade flows than geographic size.

As regards the regional integration arrangements, the results are quite interesting in the sense that COMESA overshadows SADC in the southern African region (see Table 5.4). COMESA has a relatively high coefficient (1.1686) and is significant in the analysis. Asean also proves to be significant, but carries a smaller coefficient than SADC. As compared with previous studies, this result is encouraging for regional integration efforts in Southern Africa, and in particular for SADC. The result supports the conclusion by Elbadawi (1996) that SADC's prospects improved over the two time periods examined (1980-1984, and 1986-1990). This result should be read with caution, however, since not much can be gauged as to the distribution of increased intra-regional trade within SADC (Cassim and Hartzenberg, 1998). The distribution of increased trade potential in SADC will be examined in the next section.

The next model to be estimated is similar to the Cassim and Hartzenberg model except that the sample comes closer to a total world sample. It includes bilateral EU and intra-EU trade. Reference was made, early in this chapter, to sample selection and country coverage.

The model in Table 5.5 below differs from Cassim and Hartzenberg (1998) in as far as it consists of a broader sample of

to my results here which are the opposite.

countries, specifically the inclusion of intra-EU trade. It has 1565 observation points compared to the developing country sample that has 879 observations. The main idea is to explore how sensitive the model results are to an extended country coverage, or sample range.

Table 5.5, like table 5.3, sets up three different equations. The first two (a and b) are very similar with the aim of testing the sensitivity of the results, for the main gravity variable parameters, for the inclusion of specific dummy variables. Column 5.5c, is also a sensitivity test, but focuses on the impact of replacing one of the main variables, population with that of per capita income. The results change slightly. This is counter-intuitive in the sense that if $\log(\text{GDP})$ is included, the results should be identical whether population or $\log(\text{GDP}/\text{POP})$ is used. The different results may be explained by the fact that the per capita income is the GNP/per capita figure, which may be different from the GDP/per capita.

It is interesting to note that if one compares the model in table 5.4 with that in table 5.5a, the results in the world sample model are not fundamentally different from the developing country sample model, at least, when the same variables are used. However, the co-efficients in the world sample change dramatically with some changes in the variables.

Table 5.5**Model Single Country Variables: World Sample**

Variable	a. All Variables	b. Selected Variables	c. Selected Variables, with pop variables replaced by percapita income
Constant	-11.141	-9.123	-8.5764
Log(GDP _i)	1.0323*	0.9874*	1.1698*
Log(GDP _j)	0.69622*	0.6492*	1.0723*
Log(dis _{ij})	-0.44025*	- 0.4889*	-0.99759*
ADJ	0.82052*	- 0.9304*	-0.70848E-01
Lang	0.70147*	0.5703*	0.64507*
SADC	0.65683*		
Mer	-0.15335E-02		
Asean	0.72792*		
COMESA	0.32279	0.19290	-0.70193E-02
ISL	0.27695E-02	0.1748	0.45309E-03
Log(POP _i)	0.12532*	0.21301*	-0.15931*
Log(POP _j)	-0.45849*	-038615*	-0.60060*
Log(AREA _i)	-0.23424*	-0.26797*	-0.19707*
Log(AREA _j)	-0.23827*	-0.25874*	-0.47188*

Notes:

i) Significance at the 5% confidence interval

ii) – Estimated Equation – $\ln T_{ij} = b_0 + b_1 \ln (GDP_i) + b_2 \ln (GDPPC_i) + b_3 \ln (GDP_j) + b_4 \ln (GDPPC_j) + b_5 \ln (dist_{ij}) + b_6 (ADJ_{ij}) + b_7 (LANG_{ij}) + b_8 (RI_{ij})$

GDP_i represents the potential of the exporting country and is very significant. GDP_j of the importing country is also positively correlated with increasing trade. The distance variable has the right sign in the sense that increased trade is negatively correlated

with distance. An interactive dummy was used as an indication that this variable may hide the fact that the transaction costs of trading in Africa in respect of distance are far higher than the world average. The interactive dummy was calculated as 1 for distance between two countries in Africa and 0 for distance anywhere else. This was multiplied by the actual distance used. However, the dummy was not significant. What is striking, is the fact that the COMESA dummy is significant in the Cassim and Hartzenberg developing country sample but not significant in the total world sample. Likewise the SADC dummy is significant in the world country sample but not significant in the developing country sample. This shows how important sample selection is in determining both the significance and relevance of some dummy variables. Intuitively, intra-regional trade, in both the SADC and COMESA regions, has increased marginally in the last decade. Its share, however, remains small relative to the extra-regional orientation of these countries.

Some experimentation was carried out, specifically to test the relative sensitivities, or impact, of two interchangeable variables, per capita income and population. The model in table 5.5 was re-estimated with GNP/per capita instead of the population. These results are presented in table 5.5c. It is interesting to note that when using per capita income, the co-efficient of the exporting country is positive compared to the co-efficient of population of the exporting country that is a negative. One reason is that in many countries, specifically in the developing world there is a more direct inverse link between large populations and market power. What is more reliable is the per-capita income rather than the size of the population.

Like the first set of estimations (Table 5.3a-c), the model here attempts to look at how the exclusion of dummy variables

influence, or bias the main explanatory variables. Interestingly, the exclusion of certain dummies in column two do not make a significant difference to the co-efficients, except for a slight reduction in the GDP co-efficient and a slight increase in the distance variable. What is even more striking, however, is that the co-efficient of the distance variable doubles when the equation is estimated without the dummies but instead uses per capita income rather than population.

Another area where the results here differ from some of the published literature is in the relative importance of the income of the importer or exporter to trade flows. Ogunkula (1994), for example shows that in relative terms income of the importers affect total trade flows more than those of the exporter. This applies to most of the other models (see Foroutan and Prichett, 1993 and Wang and Winters, 1991). However, in the above estimations, income of exporters is relatively more important. Once again, this may have to do with the time period and the sample selection in the model here that is quite different from most of the others.

An important message to take from this exercise is that the magnitudes of co-efficients, as opposed to the level of significance or the signs of the co-efficients, are sensitive to sample selection or the interchangeability of similar proxies. What remains consistent through all sensitivity exercises is the importance of some co-efficients relative to others. For example, the co-efficient of the GDP of the exporting country in models 3a to 3c has a different magnitude in every case but always remains the highest co-efficient. This signifies the enduring importance of the growth or the size of a country to export potential.

3.3 Estimating the Model with a Control Group Sample to Compare Actual Trade with Theoretical or Potential Trade

Although the gravity model is not dynamic, one is able to derive 'dynamic like' results. By replacing the estimated set of co-efficients with a set reflecting a plausible future state of affairs, one is simulating a potential trade scenario. This is done by using an appropriate non-SADC sample of countries and inserting the derived co-efficients into the predictive equation consisting of Southern African country trade pairs. In general, the co-efficients are calculated by inserting the main variables into the equation and these are then calculated and added in order to give potential or theoretical trade.

It was emphasised earlier that the gravity model can be used both to decompose ex post the impact of integration on trade and to determine ex ante how different trading conditions, not necessarily a FTA, will influence future trade patterns. A major contribution of this thesis is to focus on the latter. The key issue examined here is whether intra-regional SADC trade is low, high or normal? To determine this a comparator region is used as a benchmark. If it is low, will SADC trade increase to normal levels and if so why? Put differently, what would intra-regional trade in Southern Africa be under different circumstances?

Given below is a simple illustration of how trade projections are made. The basic mathematical expression is as follows:

Step 1: Estimate co-efficients for comparative situation.

$$\text{Log (E) value} = (1.036)*\text{Log(GDP1)} + (0.8459)*\text{Log(GDP2)} + (-0.9926)*\text{Log(DIS)} + (-0.15457)*\text{Log(pop1)} + (-0.10555)*\text{Log(pop2)}$$

The co-efficients are elasticities and the observed values are logged. We are now interested in absolute values.

Step 2 Anti-Log E value to give potential exports instead of the log of exports:

$$\text{Anti-Log (E) value} = (1.036)*\text{Log(GDP1)} + (0.8459)*\text{Log(GDP2)} + (-0.9926)*\text{Log(DIS)} + (-0.15457)*\text{Log(pop1)} + (-0.10555)*\text{Log(pop2)}$$

(See Baldwin 1994; Wang and Winters, 1991 for international examples).

The co-efficients of the base estimation using the SACU control group are in Appendix 10. What is important about the control group is that a dummy capturing the group, such as SACU, is excluded from the model simply because the aim is not to test the impact of SACU on trade but to structure a sample that characterises intra-SACU trade relative to SACU countries trade with other partners outside of the customs union. Hence SACU is the reporting country in this sample and the rest of the trade combinations consist of their trading partners.

SACU is a very relevant and appropriate experiment. It has existed for a long time and has been one of the few, if not the only success story of market integration in Africa. Intra-regional trade is higher

than that of the EU and the economies in the region have converged considerably over the years (see Chapter 3). It is in a sense, a 'best case' micro-cosm of SADC in the future.

Table 5.6 shows actual trade flows compared to potential trade flows. Firstly, predicted trade is based on SACU as a set of reporter countries. The first column consists of actual exports based on average 1991-1994 data in million of dollars. This is based on the trade data used in the model. The second column consists of potential or theoretical exports once the base coefficients are inserted and new values are calculated. The third column represents the difference between actual and theoretical trade.

The results are striking and in some ways very intuitive. Specific areas where potential trade is less than actual trade are mostly South African and Zimbabwean exports to the region. In the case of South Africa, in all instances, its potential exports are significantly lower than its actual exports. This is very interesting in the sense that trade patterns are currently skewed in favour of South Africa.

The negative differences between South Africa's potential and actual trade are specifically high for Zimbabwe, Malawi and Angola. The above results also make a great deal of sense as far as South Africa's exports to Zimbabwe, Malawi and Mozambique are concerned. The former has had preferential trade agreements with Malawi and Zimbabwe during the apartheid era accounting for a disproportionately higher level of trade relative to other Southern African countries. South Africa's trade with Mozambique has also grown phenomenally in the post - reconstruction era in the latter.

Table 5.6**Actual, Potential and Projected Trade Flows based on SACU****Control Group, Values in \$1 million**

	Actual Exports	Potential Exports	Difference between Potential and Actual	Projected Exports	% Increase from Potential to Projected Exports
MALAWI-ANGOLA	0	13	13	16	24.11
MOZAMBIQUE	0	12	12	15	28.54
SA	47	17	(30)	20	19.68
TANZANIA	0	14	14	17	19.75
ZAMBIA	0	14	14	17	20.80
ZIMBABWE	5	14	9	18	25.61
MAURITIUS	0	13	13	17	29.24
ANGOLA-MALAWI	0	14	14	16	17.68
MOZAMBIQUE	1	12	11	14	19.68
SA	197	16	(181)	19	20.18
TANZANIA	1	13	12	16	20.02
ZAMBIA	7	14	7	16	15.83
ZIMBABWE	48	14	(34)	17	20.60
ANGOLA-MOZAMBIQUE	0	13	13	16	24.95
MALAWI	3	13	10	15	16.96
SA	190	17	(173)	20	15.94
TANZANIA	0	12	12	15	24.02
ZAMBIA	1	12	11	15	27.97
ZIMBABWE	54	13	(41)	16	25.78
MAURITIUS	0	12	12	16	29.99
ANGOLA-SA	0	16	16	20	25.81
MALAWI	25	15	(10)	19	24.48
MOZAMBIQUE	0	16	16	19	18.28
TANZANIA	11	15	4	19	26.54
ZAMBIA	10	16	0	19	21.46
ZIMBABWE	199	17	(182)	20	20.20
MAURITIUS	6	16	10	20	22.76
ANGOLA-TANZANIA	0	14	14	17	23.57
MALAWI	0	13	13	16	21.41
MOZAMBIQUE	0	12	12	15	23.69
SA	19	16	(3)	20	23.24
ZAMBIA	5	13	8	16	25.56
ZIMBABWE	5	14	9	17	21.74
MAURITIUS	1	13	12	16	26.39
ANGOLA-ZAMBIA	0	14	14	17	22.11
MALAWI	3	14	11	16	14.71
MOZAMBIQUE	0	12	12	15	24.76
SA	212	16	(196)	20	23.63
TANZANIA	3	13	10	16	23.42
ZIMBABWE	50	15	(35)	18	17.76
MAURITIUS	1	13	12	16	24.83

The second model uses a set of Mercusor and Asian countries where levels of intra-regional trade are higher on average than intra-regional trade in Southern Africa. These were calculated and the base co-efficients are given in the equation below.

$$T_{ij} = (1.134)GDP_i + (0.675)GDP_j + (-0.764) \text{ Distance} + (0.2143)Pop_i + (-0.373)Pop_j + (-0.37303) \text{ Area}_i + \text{Area}_j(-0.129)$$

The actual to potential trade are marginally different from the SACU results. In both samples the GDP co-efficients add up to two. What is particularly interesting, and consistent about the theoretical results is the relative differences between actual and potential trade in the combination of countries. Irrespective of whether we use SACU as a control group or the Mercusor and Asean samples, South Africa's potential trade is lower than actual trade.

Table 5.7**Comparing Potential Trade of SACU and Mercusor and Asia****Control Groups Values in \$1 million**

	Actual Exports	Potential Exports: SACU	Potential Exports: Mercusor and Asia
MALAWI-ANGOLA	0	13	13
MOZAMBIQUE	0	12	12
SA	47	17	18
TANZANIA	0	14	14
ZAMBIA	0	14	14
ZIMBABWE	5	14	14
MAURITIUS	0	13	13
ANGOLA-MALAWI	0	14	14
MOZAMBIQUE	1	12	12
SA	197	16	17
TANZANIA	1	13	13
ZAMBIA	7	14	14
ZIMBABWE	48	14	14
ANGOLA-MOZAMBIQUE	0	13	13
MALAWI	3	13	12
SA	190	17	17
TANZANIA	0	12	12
ZAMBIA	1	12	12
ZIMBABWE	54	13	14
MAURITIUS	0	12	12
ANGOLA-SA	0	16	16
MALAWI	25	15	14
MOZAMBIQUE	0	16	15
TANZANIA	11	15	15
ZAMBIA	16	16	15
ZIMBABWE	199	17	16
MAURITIUS	6	16	14
ANGOLA-TANZANIA	0	14	14
MALAWI	0	13	12
MOZAMBIQUE	0	12	12
SA	19	16	17
ZAMBIA	5	13	13
ZIMBABWE	5	14	14
MAURITIUS	1	13	12
ANGOLA-ZAMBIA	0	14	14
MALAWI	3	14	13
MOZAMBIQUE	0	12	12
SA	212	16	17
TANZANIA	3	13	14
ZIMBABWE	50	15	15

Continued	Actual Exports	Potential Exports:SACU	Potential Exports:Mercusor and Asia
MAURITIUS	1	13	12
ANGOLA-ZIMBABWE	50	14	14
MALAWI	2	14	14
MOZAMBIQUE	3	13	13
SA	525	17	18
TANZANIA	3	14	14
MAURITIUS	5	14	13
ANGOLA-MAURITIUS	0	13	14
MALAWI	2	13	13
MOZAMBIQUE	3	12	13
SA	525	16	18
TANZANIA	3	13	14
ZAMBIA	15	13	14
ZIMBABWE	50	14	15

Note: Rounded to the nearest decimal.

As we can see from table 5.6, the results of both control groups are strikingly similar. In a sense, this gives more credibility to the results in that an appropriate comparator region has been selected. The results are less arbitrary or vulnerable to one comparator region such as SACU.

The next step is to look at a medium term scenario, or what some call the 'the trade impact of income catch-up' assuming changes in certain variables, specifically GDP growth while other variables remain constant. The last column of table 5.6 projects potential exports assuming that the GDP of each country grows at 8% per annum for the next five years controlling for other variables. In other words the GDP values inserted into the equation are 50% higher than actual GDP values. The two set of values are shown in table 5.7.

Table 5.8**Income Catch-up : Simulated Growth in GDP
OF SADC Countries⁹**

Country	GDP (current) \$Usm1995	GDP in the year 2000) \$Usm
Angola	8,231	12,347
Botswana	4,198	6,297
Lesotho	604	906
Malawi	1,858	2,787
Mozambique	1,443	2,165
Mauritius	3030	3385
Namibia	2,304	3,456
South Africa	106,713	160,070
Swaziland	888	1332
Tanzania	3,869	5,804
Zambia	3,288	4,932
Zimbabwe	6,779	10,168

Source: Calculated from African Development Indicators, 1995-8, WB

It is important to note here that the choice of the growth rate is arbitrary. The idea really is to illustrate the sensitivity of growth in trade to economic growth. The last column in table 5.6 shows the percentage growth in trade from potential to projected growth in trade (based on growth of GDP values). It is once again striking how sensitive growth in trade is to income catch-up with trade growing over 50% in most bilateral countries. A note of caution is important here. Although the volume of trade goes up significantly with growth in GDP, this does not tell us how it grows relative to extra-regional trade. In other words, Zimbabwe's income growth, for example, may lead to a far more significant increase in Zimbabwe's exports to advanced countries than to the Southern African region. There is, however, reason to believe that intra-regional exports are more income-elastic than extra-regional

⁹ See Wang and Winters (1991) for a similar exercise.

ones¹⁰. Hence intra-regional trade would respond to intra-regional growth in GDP much more easily.

Another limitation of these results is that it does not tell us what form or pattern the growth in trade will take- that is inter industry or intra-industry. As was noted there has been some reluctance amongst users of the gravity model to use total trade as opposed to trade in industrial goods.¹¹ Some authors point out that the gravity model could be misleading for total trade since many developing countries trade is integrally linked to resource endowment and not the structural variables of size, per capita income and distance (Baldwin, 1994).¹²

4. OVERALL DISCUSSION OF RESULTS

It is clear that the traditional determinants of integration can be divided into four categories. Firstly, there are, on the basis of our model, the classic gravity determinants – essentially proximity and size of respective economies. These are characterised by distance and income and have proved to be the most significant in most gravity models with characteristically high co-efficients.

The second important determinant, derived from size, is the economic behaviour or growth rates of the economy. By projecting growth in income, trade increases at a similar rate (the GDP elasticity of the exporting country is around unity). Naturally, the model did not look at the welfare effects and likely dynamic effects. A model capturing these effects is likely to produce more

¹⁰ This is based on the assumption that countries intra-regional exports are generally more income elastic than are their extra-regional exports. This assumption is derived from observed trade patterns that show how most countries, specifically South Africa and Zimbabwe, export more manufactures to the region than they do extra-regionally. This assumption, has, however not been formally tested.

¹¹ This issue is discussed in chapter 4.

spectacular growth in trade in response to increased economic growth.

A third important dimension of integration is policy intervention specifically trade preferences. What we learn from both the derived estimates as well as our review of other applications is that trade preferences can matter but are, by and large, overshadowed by other important factors such as structure and size. Difficulties in collecting data on tariff and non-tariff barriers imply that it has not been possible to directly estimate the effects of artificial obstacles to trade (see Wang and Winters, 1991).

Fourthly, the analysis has highlighted the importance of the structure of the integrating member economies. In this case, the gravity model is weak in that it does not capture supply and demand conditions at the micro level or the nature and behaviour of firms in a country. Because the data is aggregate data, it is also difficult to capture the level of diversification of the trade profiles of individual countries. However, in spite of the fact that the gravity model is not elaborate or detailed enough to provide more substantive clues on these issues, one broad indicative proxy for structure is the per capita income variable characterising the level of development of a specific economy. One of the ways in which the gravity approach can be tailored to look at the potential for diversification of trade potential and trade patterns is to create disaggregated samples of manufacturing trade rather than using total trade. Clearly data constraints precluded this option here but with increasing improvement of data it will be possible to do this in the future.

¹² Although this is true – it is reasonable to assume, a few exceptions notwithstanding, that there is a strong correlation between dependence on natural resources for trade, size and per capita income – making the argument as to why it may still be legitimate to use total trade figures.

Another important dimension to model is the generation of co-efficients to introduce a predictive element to the overall results.¹³ It was noted earlier that the gravity model allows one to develop a norm around which you can assess whether trade levels are unusually high or low. The question here is whether intra-regional trade has increased more rapidly than would be predicted in a systematic framework measuring normal trade? The answer is yes, according to the results here, specifically for non-SACU SADC trade.

While proximity and size are important, regional integration cannot be entirely explained by these variables. In other words, to determine the impact of distortions such as prices, product by product trade creation and trade diversion would be more useful in some ways. As the gravity model cannot distinguish between trade creation and trade diversion one certainly cannot generalise from the increases in intra-regional trade to increases in welfare (Wang and Winters, 1991:14).¹⁴ The model does not tell us much about welfare, or more specifically, the welfare implications of trade. More far reaching conclusions about welfare will require a multi-country regional general equilibrium model. Prices have been excluded from the gravity model for very good reasons (see previous chapter). However, the lack of relative prices means that we have little leverage to assess the impact of trade policy and other distortions in a behavioural sense.

Like the international literature this thesis finds that all the non-dummy variables are statistically different from zero. When comparing the results of the model here to those generated by

¹³This approach is common in the literature. See Wang and Winters, 1991, Baldwin 1994 and Ogunkula, 1994.

¹⁴Although signs of co-efficients for regional dummies are used to indicate whether the agreement is trade creating and diverting, they are merely indicative. It is not possible to actually quantify the extent of diversion or creation as is done in the Vinerian derived equations in chapter 2.

similar models, it's clear that results differ across different models. This can be attributed, as was noted earlier, to the sample size, differences in sample choice, and pooling. Pooling is useful but, in this case, averages are more meaningful in the sense that the sample is not likely to be influenced by wide fluctuations in the trade characteristic of many developing countries.

One of the concerns with the theoretical or projected trade flows is whether there is any way of assessing whether the model is overestimating or under-estimating trade flows. Most of the empirical applications rarely question the efficacy of the theoretical trade flows they generate from their models.

Markheim (1994:108) argues that *ex ante* studies of trade policy changes uniformly underestimate the impact on trade flows. One reason why they undervalue what occurs is that changes in tariff rates invoke countries to shift larger amounts of resources towards the production and supply of exports. The gravity model on the other hand could either overestimate or underestimate the effects of integration. This depends on the comparator region selected. The risk of choosing the wrong comparator region was minimised by using two samples. Both produced similar results.

CONCLUSION

The model looks at the average of SADC trends from 1991-4. It is clear that the main determinants of growth in intra-regional trade will be growth in GDP and GDP per capita amongst SADC countries and a reduction in the transaction costs to trading. However, the model shows that despite the enduring importance of these structural determinants, there are some additional factors

that can also make a difference to trade. These include factors such as language differences and adjacency.

An important consequence for policy is the issue of whether there is a good reason for a regional trade liberalisation strategy in lieu of, or in conjunction, with a unilateral liberalisation strategy. The results do not provide a straightforward answer. One thing is clear that growing integration is likely to be the result of increasing economic growth irrespective of whether this comes from unilateral or regional trade liberalisation. However it seems that there is some scope for increased growth in intra-regional trade, without increasing growth in GDP. In most cases, predicted trade is higher than actual trade. In other words, unnecessarily high transaction costs in the Southern African region act as a bias against trade in the region and instead encourages firms to trade extra-regionally.

In summary, the results of the gravity model are very telling. They show that in the face of low economic growth, we are unlikely to see a major growth in intra-regional trade. Notwithstanding this, policy makers should pay attention to reducing the transaction costs of trade – which in itself can play a role in integration. In other words, if countries in the region are experiencing low growth- it does not mean that policy makers should do nothing about regional integration. There is much that can be done, but should be done in the context of broader growth strategies of which regional trade liberalisation is one small component compared to, for example, unilateral liberalisation, public sector restructuring and a range of other policies that could more directly affect growth.

To generate results that would enable us to answer more specific issues what is needed are more sophisticated proxies for transport

and transaction costs, more disaggregated data preferably by sector, and more analysis of the impact of trade on resource allocation and production. These issues are taken up in greater detail in the concluding chapter.

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CHAPTER VI

CONCLUSION

1. Introduction

This chapter begins with an evaluation of the findings of this thesis and then moves on to identify areas for further research. It pays particular attention to how the gravity model can be extended further. It also shows that work on the non-traditional dynamic effects of regional integration should not be abandoned but preceded by an analysis of the basic structure and growth patterns of the SADC region. The chapter will outline ways in which research can begin to apply non-traditional paradigms to the SADC experience. These may be of particular relevance to policy making in Southern Africa.

This chapter naturally draws on the thesis as a whole and is organised as follows. The first section introduces the issues relevant to intra-regional trade. A discussion of intra-regional trade is looked at from various angles: the economic structure of the region, the growth behavior of the economies and the link to concepts such as trade diversion and trade creation. A broad discussion of these issues serves as a prelude to the next section that reviews the different measures of trade potential. These are compared and the differences explained. The sections, thereafter, focus more explicitly on new research areas beginning with a discussion of the relevance of static general equilibrium measures, highlighting the usefulness of this approach to policy making. This is followed by a discussion of adjustment problems likely to be envisaged in the FTA. The section shows that adjustment problems are really difficult to measure and that is precisely why the thesis does not grapple with this critical issue. There are however, some ways of identifying

adjustment problems. The thesis went to considerable lengths to argue that many of the new dynamics effects are not empirically testable. Nevertheless there is scope for preliminary work on this. Some recommendations are presented as to how we can begin research in Southern Africa using these insights. The final section recommends some extensions of the gravity model for future research.

2. Trade, Structure and Growth

This thesis began with an exploration of theoretical issues on regional integration and argued that trade creation remains an important area of consideration for Southern Africa. But an important argument presented from the outset is that any analysis of regional integration in SADC should be based on a systematic evaluation of the structural characteristics of the region, and the impact of these characteristics to intra-regional trade.

Chapter 3 provided a detailed examination of the economic character of the SADC region focusing, amongst others, on the differential growth behaviour amongst member countries and a raised a series of questions as to how factors such as the high asymmetry in size and level of development of the different economies, their varied industrial structures and diverse economic policies influences the prospects for a successful programme of market integration. Some emphasis was placed on the sensitivity of various measures of intra-regional trade in SADC. This analysis clearly revealed that SADC trade in the region is not particularly low by developing country standards. However, there is an important caveat here. Intra-SACU trade contributes disproportionately to total intra-regional SADC trade. It is estimated to be over 80% of total trade in the region.

The emphasis given to the examination of trade potential amongst SADC countries was motivated by some concern of perceptions in the SADC policy-making community, that a major objective in SADC should necessarily be to increase intra-regional trade. There has been too little hard consideration of whether this is really the best option for the region. For example, an important alternative is for these countries to follow an exclusive path of unilateral liberalisation.

This thesis has focused on the question of whether there is a basis for a natural growth of intra-regional trade in the region under current conditions. A different way of looking at this question is to evaluate the extent to which trade patterns, particularly SADC countries' overwhelming orientation to trade with developed countries, result from natural endowments and trade complementarities or from specific historical factors and other distortions. These issues were examined through an analysis of the major characteristics of the Southern African region as well as through a formalised model that tested the importance of certain structural variables in determining intra-regional trade patterns.

In sum then, this thesis offers an argument about why growth in intra-regional trade has to be seen in the context of various institutional, structural and policy factors. Although an analysis of the economic welfare impact of regional trade liberalisation has not been the central focus of this thesis, it has been aired in the discussion as it provides an important framework to assess welfare implications. So, this thesis has not estimated Vinerian product by product trade diversion and creation effects of integration. Yet, this approach was still discussed in an early chapter because it provides an indicative framework to assess the welfare implications of regional trade agreements. From a review of this traditional theory of regional integration we know that growth in intra-

regional trade that is induced by trade diversion is certainly a problem. But, from later theory we also know that as long as trade diversion induces significant consumption gains, it may not necessarily be welfare reducing overall. The ultimate benchmark is a comparison of relative magnitudes of consumption gains and revenue losses.

Our review of the Vinerian approach also flags the importance of income transfer effects as well as giving some indication of allocation impacts of regional integration. For example, the Vinerian analysis alerts us to the possibility that, if non-SACU SADC countries are importing from South Africa within a FTA agreement there could be some transfer of income, brought about by trade diversion, from these countries to SA. This could engender greater polarisation amongst the countries, specifically South Africa and the rest of the region.

Current trends show exponential growth in South African exports to the SADC region. One indicator of changing trade patterns is the growth in South Africa's trade surplus with the region. The causes and consequences of these skewed trade patterns were put into perspective. It was pointed out that these bilateral trade deficits or surpluses are not as important as the total aggregate balance of payments of a country. It was also emphasised that South Africa's exports to African countries were predominantly in manufactures and the former competed with other suppliers on similar terms. In other words, South Africa does not receive preferential tariffs. Preliminary research shows that South Africa's advantage derives primarily from its lower transaction costs relative to northern country suppliers. One of the major empirical problems experienced was the determination of accurate estimates of intra-regional trade in Southern Africa. Nonetheless by assembling the available data and by noting that a large part of trade goes unrecorded it could be demonstrated that total intra-regional trade in SADC is not low

by developing country standards. However, as mentioned earlier, it is low for a certain subset of countries, specifically non-SACU SADC countries.

Trying to disaggregate intra-regional trade at the level of individual products in SADC has proved to be an onerous task because of the lack of sufficient data. This was a major reason why this thesis was driven primarily by a conceptual framework that was concerned with trade potential in the aggregate. However, in the final analysis the details of where trade potential will exist and amongst what range of products is critical in order to understand adjustment effects and who potential losers and gainers in specific sectors are likely to be. A review of tariff protection in Chapter 3 makes a small contribution in this regard by showing that trade-weighted intra-regional protection is low. However, even this had to be qualified by the fact that there are many sectors where no trade takes place because of high levels of distortions. These distortions include high levels of protection in sensitive sectors as well as NTBs.

Notwithstanding some of the data problems there are various initiatives in progress to improve data collection that will make it possible to do a Vinerian analysis. In particular, a recent initiative by the World Bank to collect product by product data on regional trade flows in Southern Africa with duty collection rates and tariff rates will allow a Vinerian analysis.

3. Quantifying Trade Potential

Following on from a discussion of the Southern African economy and the region's trade related policies the thesis then went on to review and

evaluate some calculations of potential trade in Southern Africa. Juxtaposed with these were some original calculations of trade potential. The results of different methodological approaches in measuring the impact of trade differ in some ways. There is a range of widely used techniques in measuring the impact of economic integration. These include basic descriptive analysis, to various kinds of econometric work and multi-country partial and general equilibrium analysis.

What the gravity model suggests is that a programme of intra-regional trade liberalisation could engender further trade potential in some country combinations. Indeed this will depend not only on tariff liberalisation but also on overall reduction in trade costs. In the gravity model trade in overall terms comes down from US\$2314 million to US\$775 million. This represents a decrease in trade of over 50% but increases significantly for non-SACU SADC countries' exports to South Africa. This finding is consistent with the many other models that show actual trade in Sub-Saharan Africa is greater than potential trade (Fouratan and Prichett, 1993).

A key message from the gravity exercise is that what is important is not only overall trade potential in SADC but the trade potential amongst bilateral country combinations that make up SADC. The projections of the model show that the trade potential for non-SACU SADC countries is higher than it is for SACU countries in the SADC region. This can be explained by the fact that SACU has more or less realised its trade potential in the region while the non-SACU countries have yet to realise this potential.

The Evans model, on the other hand, shows an overall increase in trade to about 12% if one uses short-run elasticities to about 25% for long-run elasticities. If the model were to be upgraded to a general equilibrium

one, the trade effects are likely to be the same – except that the model is likely to give more information on factor prices and other second round effects. However, what is likely to change the results of the model more dramatically is the incorporation of scale economies and imperfect competition since additional gains can be derived from the benefits associated with a FTA when scale economies and pro-competitive effects are present.

Chapter 3 reviews literature on projected trade potential in the SADC region based on a simple, descriptive method by looking at potential trade which is defined as the value of imports currently coming from the rest of the world for which at least one SSA country is making significant exports to the rest of the world. The projections are nevertheless instructive and show impressive trade potential. For example, SACU's imports from SADC in 1995 were \$402 million while potential imports are estimated at \$4919 million. This figure may be unrealistic but it does suggest large potential increases.

The gravity model is driven by a very different framework from other models. It is not so much concerned with the impact of trade liberalisation on the allocation of resources as with the extent to which reduction in transaction costs influences trade potential, controlling for other structural factors. So the impact of regional tariff liberalisation is estimated through its cost reducing impact.

4. Static General Equilibrium Effects

Static PE and CGE models were discussed in Chapter 3 in the context of an evaluation of the Evans model. These approaches are broadly concerned with the economic impact of a specific shock (trade liberalisation) on the allocation of resources. It was noted that static

models generally produce small effects in the aggregate but could be very useful at the more dis-aggregate level. The models give policy makers a good feel for the internal distribution effects of trading blocs (Hoekman et al, 1998). Another important advantage of these analytical ex-ante models is that they can determine static effects under different scenarios. In other words, a trade shock can be partial or complete and these will produce very different results.

One of the major reasons why some attention was paid to *ex ante* analytical models is that they are very important and widespread in measuring the impact of regional integration. A review of the pros and cons of this approach was done in the context of a model applied to Southern Africa, namely that of Evans.

While the basic Viner approach simply depicts the relationship between demand and supply of traded goods, the Evans model, although partial equilibrium, went beyond trade and to capture direct output and employment effects. This is a real improvement over Viner as far as welfare is concerned, even if the model does not capture second round effects.

Upgrading from PE to CGE would allow for the tracing of cross-sectoral effects of any trade shock and would capture, in a more overarching way, how demand and supply in one sector influences another sector. A discussion of CGE models cannot be ignored in any work looking at integration. They have played a critical role in giving us a better idea of welfare by looking not only at trade effects but other effects that can fundamentally change the way we measure the welfare implications of a RIA.

A specific challenge is to incorporate economies of scale and pro-competitive effects in the context of regional integration. There is almost no work in Southern Africa of this kind either within the area of economic modelling or at the level of sectoral industrial analysis. Indeed, very little consideration was given to economies of scale in this thesis too partly, as was pointed out, because it is difficult to determine exactly how firms in the region are able to benefit from economies of scale. One way is to estimate cost functions for particular firms or industries, calculate the returns to scale and then estimate the cost reductions, which could be achieved if the firms were able to supply the entire Southern African market. This analysis would require cost data for firms.

A point made earlier was that there are good reasons to argue that scale effects may be more important to the region than they would be to the rest of the world. Simply put, the argument is that many important products are exported regionally and not internationally. There is a need to identify case studies of different sectors to determine the industries where a regional market may be particularly appropriate.

What is clear from the review of the different approaches is that the magnitude of trade and welfare effects is sensitive to the choice of the methodology. However, even within specific methodologies, there are sensitivities to the assumptions of the models, the sample bias and a range of other factors.

5. Adjustment Dynamics

At the end of the day, all the projections of trade are effectively comparative static models and do not trace the path through which an economy travels from one equilibrium to another. But how far can we go in tracing the path of adjustment? This is an important question bearing

in mind that despite the beneficial effects of a FTA in SADC there are some concerns about regional polarisation and transitional adjustment dynamics.

The analysis that comes closest to looking at the impact of a FTA on industry in the region is the Evans model. The model shows which broad sectors in specific countries will experience output and employment gains or losses. However, the impact is likely to be more complex than that depicted by the model. Indeed, CGE models will provide further insights into adjustment effects and should be an important area for further research.

There are several reasons why it is difficult to examine adjustment or de-industrialisation effects. Firstly, adjustment processes are dynamic and are difficult to model. Secondly, more specific details are needed of the schedule of liberalisation and whether it is a one off liberalisation, or in gradual phases over a specific period. Finally, very detailed data of firm behaviour is required that is generally not available. There are some audits, though not comprehensive, of the main firms and sectors in the different countries in SADC from which some preliminary analysis can be made (DBSA, 1996). What is lacking is more focussed region-wide industry analysis to ask specific questions as to the scope for inter-industry versus intra-industry specialisation in the region and how will the FTA influence this process.

What is clear is that if integration leads to adjustment but that this adjustment actually occurs as part of an economic growth process, then industrial restructuring in the context of slow growth will be difficult. It was shown that, with the exception of Mozambique and Botswana, growth rates in the region were modest at best. Moreover, industrial capabilities in the region differ considerably with South Africa, at the one

extreme, with a diversified industrial sector while countries such as Angola and Namibia have very small industrial capabilities. This raises the critical question as to whether firms can withstand the adjustment costs of industrial restructuring that are likely to be brought about by a regional FTA.

The difficulty of adjustment costs reinforces the point made in the thesis that growth is one of the most important factors promoting successful regional integration. However, there may be a causality problem between growth and RI. In other words, RI could act as an important impetus to growth or vice versa. Growth and integration, in fact, are mutually reinforcing. Adjustment with reasonable growth rates will not derail the process of further market integration.

6. New Dynamic Effects: Specific Case Studies

As mentioned earlier, an exclusive focus on more recent theoretical developments in RI is simply jumping the gun. This does not imply that these new theoretical developments should be discarded. They have certainly equipped us to raise a series of new questions about integration. These are considerations, other than trade, such as investment effects, credibility effects, location effects and growth. It is important to take these issues further.

A consistent argument put forward in this thesis was that many of the new dynamic effects are difficult to formalise into an analytical framework. But they have important policy implications and analysis can go a long way to begin to capture these effects although it may not be definitive. A starting point is to understand key problems in SADC economies beyond trade and to establish whether integration can play a role.

It was mentioned that these gains are very case- specific. Hence it would be useful to explore the effects to the specificity of the Southern African experience. For example, it was concluded that RI's could confer gains on to developing regions if certain conditions were met. Firstly, if there was a real lack of policy credibility in the integrating economies and secondly, if integration made the cost of exit high. A missing link in this argument is an assessment of the likelihood that the agreement as a whole will be credibility enhancing.

It may be reasonable to assume that many countries in Southern Africa suffer from time in-consistent policies. It is not clear how a SADC agreement could be made to entrench or lock in reform policies that make them credible. The major reason for this is the lack of an anchor member economy with highly credible policies. This is usually a developed country such as the case of the US in NAFTA providing an anchor for Mexico. It was noted earlier that one of the important points that come out from the theoretical literature is that non-traditional dynamic gains from integration are more likely to be realised for a developing country if the integration agreement is with a developed country.

The most developed country in the SADC region is South Africa. But could it assume the role of an anchor economy? Indeed, South Africa itself is undergoing a transition and a fragile reform programme. Even if one is looking for institutional gains for smaller countries in SADC – South Africa may not guarantee this. Likewise, for South Africa, a trade arrangement with the EU, for example, may be more appropriate from the perspective of lending credibility to the country.

The implications of this for further research are important. Firstly, another kind of regionalism could be considered such as the whole SADC forming a FTA with the EU. Or, alternatively, member countries in SADC should, on a unilateral basis, accelerate their multilateral reform programmes. What this implies is that policy credibility may be best dealt with not by regionalism but by multilateralism.

The interface between growth effects, location effects and investment effects features prominently in the new literature. These were all discussed separately, but they have to be seen in unison as they often reinforce or undermine each other. It was emphasised earlier that the accumulation of physical and human capital and technological progress are the principal causes of economic growth. The major constraints on growth in many SADC countries are low savings and investment rates.

Will regional integration enhance the SADC members' country growth paths? Although, at the end of the day, this thesis is unable to answer this question directly, it has at least been possible to clarify the relationship between the growth and integration. More specifically, elasticities were estimated to quantify the responsiveness between growth in trade and the growth in the size of the economy. This growth simulation held all other factors constant. This implies that it is a lower bound estimate of potential. It revealed that a 1% growth in GDP induces growth in trade by more than 1%. If we allow for the fact that growth and investment induce many more external effects too, the net impact may be higher.

If integration sends better signals to investors then it has the potential to encourage inward FDI to the region. The link between, RI and investment, as was noted is indeed complex involving an array of variables. For one, it is important to distinguish between investment

effects in the region, as opposed to investment effects on individual countries within the region. In addition, there is the link between trade protection and investment – specifically the extent to which reduction in tariffs may influence the locational decisions of firms. In this case, we are talking mostly of the relocation of South African firms to the other SADC countries. As was shown there are many factors that will influence the locational decisions depending on labour costs, the size of the market, infrastructure and agglomeration.

An important first step would be to assess whether there are studies done on the determinants of investment in individual SADC countries. This would provide a good starting point to investigate what determines investment behaviour in Southern Africa as a whole. In other words, basic economic problems such as, amongst others, financial intermediation, low savings rates and the lack of policy credibility may be the major obstacles to investment. The interesting question is not how much RI can influence investment but how can it influence these first-order fundamental variables that determine investment behaviour.

Another important omission of this study is the political economy effects that can often make or break regional integration agreements. A study of political economy effects will be particularly important if there is consensus that an integration agreement will be welfare enhancing. Some references were made to political economy effects in Chapter 3 where there has been a perception that South Africa's increasing trade surplus with the region implies that the former was gaining unfairly while the latter was losing. The problems with this perception were highlighted showing that bilateral trade surpluses or deficits are not particularly useful. But more serious political economy effects take place in member country domestic economies. This is where further research

has to focus on. There are indeed winners and losers from a FTA in every member's domestic economy.

An argument advanced here is that the so-called second best solution of regional trade liberalisation may be only worthwhile if there is real potential for trade amongst the SADC countries. In the formal literature the argument as to why a second best solution is worthwhile is because at the regional level it is possible for fewer countries to derive higher efficiency gains by effecting deeper forms of integration. Deeper levels of integration aim to reduce the market segmenting effect of differences in national regulatory regimes through either co-ordination, harmonisation or mutual recognition of national laws, regulations and enforcement mechanisms. A key challenge for future research would be to investigate the efficiency gains that deeper forms of integration at the regional level will have for SADC as opposed to the so-called shallow forms of integration for individual SADC countries at the multilateral level.

7. Extensions of the Gravity Model

The key lessons from the gravity model were spelt out in Chapter V. The gravity estimations showed that the key structural determinants of trade potential are size, level of development and transaction costs. It was emphasised that the model is not a model of comparative advantage. Hence it is less useful in explaining why countries in the region trade as it is in suggesting the size of potential trade flows.

With better data, several extensions of the gravity model could significantly enhance the policy debate in the region. Firstly, attempts could be made to estimate the model for manufacturing potential or intra-industry potential. This would provide a more systematic link than the thesis has been able to derive between the level of intra-industry

trade and the structural determinants of trade such as growth and differences in the levels of development.

The second extension to the gravity model is to model transport costs more explicitly. This would entail a series of exercises to develop better indices of transaction costs – which may even produce higher coefficients and more robust results. What is needed is a further unpacking of transaction costs. There are three major foci here. First, there is the breakdown of various factors that contribute to transaction costs. Second, there is the need to identify different mediums through which goods are transported. For example, many landlocked countries depend heavily on international throughways for imports and exports. Transport costs can often account for as much as 30% to 40% of total import or export costs. Road transport account for close to 70% of total costs. Finally, there is the need to explore the fact that the transaction costs could change under a FTA. Although tariffs may be eliminated, rules of origin reduce the value of preferences. This should be an important area of future research.

In the discussion of the gravity model, various explanations were given as to why prices should be excluded in estimating the model. Rather than inserting an inappropriate block of price variables in the gravity equation, the model should be complemented by estimating export demand functions that focus explicitly on price variables and price behaviour. Such models will assist in assessing the difference that tariff elimination makes to domestic prices, relative costs and production in respective markets.

In the final analysis – the aim of this thesis has not been to provide policy options or prescriptions to policy-makers. Instead the major objective has been to provide a framework to understand the basic

parameters under which intra-regional trade operates. The study demonstrated that a simple desire to see increasing intra-regional trade in the Southern Africa is the beginning and not the end of any analysis. The real work involves an assessment of the limitations that are placed on potential regional trade by the structural characteristics of the economies of trading partners as well as the policy milieu within each partner country. This thesis has made a small contribution towards examining the importance of these factors in the Southern African context. Analyses of regional integration in Southern Africa that hold such factors constant are limited in informing welfare maximising policy in the region.

APPENDIX 1

Guide to Selected International Regional Agreements.

THE European Union (EU)

The European Community has its antecedents right back in 1957 where six countries - Belgium, France, the Netherlands, Italy, Luxembourg, and West Germany - signed the Treaty of Rome to form the European Coal and Steel Community, later called the European Economic Community (EEC). As the EEC grew during the 1970s and the 1980s to include Britain, Ireland, Denmark, Greece, Spain, and Portugal, it became known as the European Community. It is now referred to as the European Union (EU) and also includes Austria, Sweden and Luxembourg.

NAFTA

The North American Free Trade Agreement (NAFTA) was concluded on the 1 January 1994, representing a free-trade agreement between Mexico, Canada and the US. It is an extension of CUFTA between Canada and the US concluded in 1989.

NAFTA has meant much greater liberalisation of tariffs on the part of Mexico which has an average of 20% ad valorem tariff, while the US has an average of a 4% ad valorem tariff (note that both in the case of US and Mexico exports are often subject to considerable charges and other types of non-tariff barriers). However, it is important to recognise that tariffs on all US exports of industrial goods to Mexico will be eliminated within 10 years. In exchange, the US will continue the current duty-free treatment Mexico enjoys today, without NAFTA, on over half its exports to the US, and will eliminate most remaining tariffs over 5 or 10 years. (Hufbauer and Schott, 1993:47)

ASEAN

The Association of South East Asian Nations (ASEAN) was formed in 1967 as an organisation opposed to the perceived threat of communism in the region. One of the main aims of the ASEAN upon its formation was to promote economic growth and increase regional co-operation and integration. It also wanted to bring about regional peace and stability and promote social progress and cultural development in the area. Through its plan to promote economic growth in the region, one of the ASEAN's objectives was to create a preferential trading arrangement amongst the member states and develop other economic mechanisms to improve the regions economic co-operation.

The countries that form part of the ASEAN are Singapore, Malaysia, Thailand, Indonesia and the Philippines. These are also known as Newly

Industrialised Countries (NICs), with the exception of Singapore which is one of the countries known as The Four Tigers, which includes Hong Kong, the Republic of Korea and Taiwan. In 1992 the ASEAN had a population of 334 million, its GDP was about US\$392 billion, and its annual foreign trade flows exceeded US\$429 billion.

Mercusor

Since the end of 1994 Mercusor was established as a customs union. Intra-Mercusor trade grew at an impressive pace from 8% in 1980 and more than doubled to 17% in 1993 and grew to 20% in 1995. Argentina and Brazil account for over 95% of Mercusor's GDP. Total intra-regional exports among Mercusor countries which were \$4 billion in 1990, more than tripled to 14.5 billion in 1995.

Mercusor has its origins in the Asuncion Treaty in 1991 consisting of a FTA. Its primary focus is integration through trade integration and has given high priority to removal of tariffs amongst the signatory countries consisting of Argentina, Brazil, Paraguay and Uruguay. Tariffs amongst countries were phased out to zero for 90% of intra-regional trade by 1994. The second phase began with the establishment of a CET on the 1 January 1995. At this stage, 85% of products qualify under the CET with the rest to be phased out in phases by the year 2001. These consist of capital goods, chemicals and petrochemical products. Telecommunications equipment will be phased in the year 2006.

Mercusor does not have the explicit objective of a common market in the EU sense with elimination of restrictions on the free movement of factors of production. However, there exists a loose arrangement of harmonisation of macro-economic policies. The existence of Mercusor rests on two important pillars. Firstly, it is the creation of democratic governments and can be seen as a long-term initiative commitment to improving the economic welfare of the region. Secondly, it is based on a commitment to trade liberalisation and macro-economic discipline. (Economist, Oct 13:1996)

APPENDIX 2

Guide to Trade Arrangements in Southern Africa

2.1 Bilateral Trade Agreements

There are various bilateral agreements that exist in the region. However, the significant agreements are between South Africa and other SADC countries. The importance of bilateral agreements among SADC countries, excluding South Africa, has declined because of the COMESA (see below).

South Africa's trade ties have for various reasons been more developed with the SACU countries; Zimbabwe, Malawi, Zambia and to some extent Mozambique, while there is very little trade between South Africa and countries such as Tanzania and Angola. In addition South Africa has specific bilateral trade agreements with Zimbabwe, Malawi and Mozambique.

The first trade agreement between South Africa and Southern Rhodesia (now Zimbabwe) dates back to 1964. The Zimbabwe Agreement was preceded by the South African-Southern Rhodesian Customs Union. Preferential tariff on specific products was provided in the bilateral agreement. Initially the agreement was to last for a period of five years but this was later extended for an unspecified period. The agreement's obligations provided for the import of specified goods into South Africa at specified rates which may also be zero. Zimbabwean clothing and textiles, in particular, benefited from various rebates or exemptions from the prevailing SA MFN duties. Other imports like tobacco enjoyed free import duty (but only a certain quantity).

Particular goods which comprised large quantity of Zimbabwean content were charged less specified duty. Also, goods produced in South Africa were afforded preferential treatment and specified goods were afforded specified duties. The rebate system was applicable to South African exports which were used in the Zimbabwean manufacturing industry. The special duties also extended to raw diamond stones exported to Zimbabwe for industrial use (Blumberg, 1994:11).

South Africa has been Zimbabwe's biggest trade partner in Africa enjoying a disproportionately high trade surplus with the latter. This put pressure on South Africa to enter negotiations on bilateral agreements to, in a sense implement an asymmetric trade agreement in favour of Zimbabwe to redress this trade balance. Economic co-

operation and trade were inevitable after the signing of the declaration of intent to speed up the trade negotiations between the presidents of the two countries. The clothing and textile industries in Zimbabwe were the main sectors to benefit from preferential treatment on the South African market.

However, this trade agreement expired in 1992 and Zimbabwe was again subject to tariff barriers. The import duties that were imposed by South Africa for protection against cheap imports from the Far East in 1992, affected the Zimbabwean clothing and textile industries adversely. It is estimated that Zimbabwean clothing exports to South Africa were worth US \$34 million in 1992, dropping by 34% to \$21.7 million in 1995. This has led to a significant decline in employment in both industries. The Zimbabweans had appealed for the reintroduction of trade preferences on the clothing and textile industry exports to South Africa. South Africa granted some of the previous preferences but negotiations are still under way for a more conclusive agreement.

Various bilateral agreements also exist amongst other SADC countries. For example, Zimbabwe has various bilateral agreements with the BLNS countries. However, the COMESA tariff reductions have diluted most bilateral trade agreements in the region outside of South Africa.

2.2 The South African Customs Union (SACU)

There is indeed a rich literature on the SACU ranging from a historical account of the SACU to the economic impact of SACU on the member countries. It is certain one of the few areas where the literature is well developed.

The SACU agreement was established in 1969 between South Africa, Botswana, Lesotho and Swaziland. The agreement involved a complex revenue-sharing formula as well as an enhancement factor (to compensate for trade diversion and polarisation) and was administered by the Consolidated Revenue Fund of South Africa. In 1976 a stabilisation factor was introduced and payments out of the above fund were exacted with a two-year lag. The net effects of the above renegotiations substantially boosted the PLNS (Botswana, Lesotho, Namibia and Swaziland) countries' receipts from the revenue pool and in each case swelled their total government revenue, albeit to different extents (Mayer and Zarenda, 1994:15- 22). By contrast, South Africa's share had shrunk - a factor exacerbated by the incorporation of Transkei, Bophuthatswana, Venda and Ciskei (TBVC) countries in SACU revenue disbursements. In 1990, Namibia attained independence and joined SACU. By 1994 there was serious dissatisfaction with the agreement among all parties and discussions

on a vigorous renegotiations of the treaty will take place soon (Zarenda, 1996).

Amidst a growing volatile debate about the effects of SACU on the BLNS countries, there is no doubt that certain revenue benefits from the arrangement accrue to the smaller partners. The huge reliance on SACU payments is reflected in the following proportions of Government Revenue from these payments for 1991 (World Bank, 1993):

Botswana	-13,4 per cent
Lesotho	-51,8 per cent
Namibia	-37,5 per cent
Swaziland	-40 per cent

The notion that SACU is highly beneficial to the BLNS has to an increasing degree been contested, specifically by Botswana. There exists a strong view amongst policy-makers that South Africa's supremacy in tariff setting has frustrated attempts by the Botswana government to nurture industries in that country. From the South African perspective, there is growing consensus amongst policy-makers that the current revenue formula is steadily eroding South Africa's revenue base. Hence all member countries acknowledge that important changes need to be made in the SACU.

The extension of the SACU to the Southern African region is not viable in the short-to-medium term for a number of reasons. Firstly, there is a high rate of dispersion of tariff rates among countries. Owing to large variations in industrial capabilities in the region there is a concern that a common external tariff may frustrate the industrial policy objectives of some countries.

Secondly, the SACU itself is undergoing a major overhaul as various issues are under review. These range from a new revenue-sharing formula, an assessment of the impact of SACU on the industrialisation of the region, to the democratisation of the SACU. There is a general view that the benefits of the SACU have differential benefits on different member countries. From the South African perspective, it is a question of balancing the control of policy making against foregoing a disproportionate revenue share. These unresolved issues would make it difficult to propose the extension of the SACU.

Thirdly, there is the fear that South African firms are generally much better positioned to reap the benefits of a larger Southern African customs union which in turn would have adverse consequences for industry in the region. This would require large amounts of compensation by South Africa. As it stands, the revenue that South Africa transfers to other SACU countries as compensation for the price-raising effects of high tariff rates is becoming fiscally difficult for South Africa to sustain. Indeed, if it is difficult for South Africa to

compensate a few countries in the SACU, its extension would mean unmanageable compensation levels.

In the end, South Africa has no choice but to restructure the SACU and ensure that the peripheral economies are not adversely affected by South Africa's national and regional policies. However, a restructured SACU is likely to engender co-existence with various other forms of agreement in the region. As Zarenda (1995) points out "It is hoped that in its renegotiations with the various SACU members, a mutually-beneficial arrangement can be reached with regard to the revenue-sharing formula, the two-year lag in payments and the establishment of a more consultative and democratic decision-making body than has been the practice of the apartheid government and the new democratic government thus far. It should also be mentioned that the protracted deliberations on this issue should not be stalled in the hope that they can be subsumed in wider regional agreements. The smaller members of SACU have legitimate grievances, which if not rectified quickly, will further increase polarisation and tensions in the immediate region - not to mention the effects on labour migration. The tendency for even the present Government to be a non-consultative 'bully boy' is totally unacceptable."

2.3 The Southern African Development Community (SADC)

The SADC was originally established in 1980 with one of its explicit objectives to decrease member countries' economic dependence on South Africa. The signatories of the original SADCC agreement included Angola, Botswana, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, Zambia and Zimbabwe. In 1990 Namibia was incorporated and in August 1992 the name and terms of reference were changed to SADC to reflect the essence of a community. South Africa was admitted in 1994 and hosted the SADC conference in 1995 at which Mauritius was formally admitted as the twelfth member of the group (Zarenda, 1995:4). More recently, two additions to SADC are the Republic of Congo and Seychelles.

The SADC option, for South Africa was the least controversial since it did not have any explicit trade protocol which meant that co-operation, as opposed to integration, was the main focus of this institution. However, much has changed and SADC has now introduced a trade protocol calling for a FTA. The likely effects of a free-trade area (FTA) in Southern Africa is a hotly debated issue. In particular there is concern whether South Africa, as the largest and the most developed economy, is uniquely placed to reap the benefits of a FTA. However, despite this concern it is SADC member countries, other than South Africa, that are more calling for a FTA on the

assumption that it could foster greater integration through faster growing intra-regional trade.

2.4 The Common Market for East and Southern Africa (COMESA)

The COMESA Agreement in Southern Africa involves 23 members. It, in a sense arches over SACU and SADC. Unlike the SADC, COMESA from the very beginning had the explicit aim of reducing tariffs among countries. Although called a common market, its main focus has been tariff-reduction rather than the broader issues of labour and capital mobility, macro-economic harmonisation and other issues that have emerged in the EU, for example, tariffs have been reduced on average by 60% to 70% on intra-COMESA trade. All SADC countries with the exception of South Africa and Botswana are members. The organisation was established at the end of 1994 and evolved directly out of the Preferential Trade Area of Eastern and Southern African States (PTA) which came into operation in 1983. It incorporates some 23 nine Southern African countries (excluding South Africa and Botswana) and has as its primary objective the eventual implementation of free trade and common market status to its members. Its institutional arrangements incorporate a Central Clearing House, a Trade and Development Bank and a Regional Reinsurance Company. It, unlike SADC, has involved the private business sector in its activities (Leistner, 1995: 273). The explicit formation of an African Economic Community remains its overriding objective.

Both the COMESA and the SADC trade protocol, hinge on the assumption that intra-regional trade liberalisation would lead to higher levels of intra-regional trade in Southern Africa. However, this hypothesis has not been systematically tested.

The idea of a common market incorporating a common external tariff, free capital and labour mobility and macro-economic convergence though exchange rate arrangements seems far - fetched for the Eastern and Southern African region. However, the trade aspect of the common market is taken seriously by the COMESA.

There are two concerns here. The first is whether the COMESA will meet its target of 0% tariffs by the year 2000, which would effectively be a free trade agreement or a custom union. The second is whether South Africa will, in the near future, become a member of this organisation

South Africa has come under criticism from the COMESA secretariat for devoting much time and energy in securing market access via the Lomé to the EU when it has ignored access to the COMESA, a market

of 320 million people. According to the secretariat, there are several reasons why this has been the case. Firstly, in 1992, \$18 billion worth of goods were imported from the United States and the EEC by 18 countries of the Preferential Trade Area. Of this, only 4.4% was directly attributable to trade from within the area. Some of these imports covered products such as mineral fuels, inorganic and organic chemicals, pharmaceutical products, edible foods, fruits and nuts, beverages, spirits, tobacco, meat, fertilisers, chemicals, plastics, tanning and dyeing extracts. Secondly, transport costs are much lower for South Africa. Thirdly, membership would allow South Africa to take advantage of preferential tariff rates. Tariff rates have been reduced by as much as 70% for members. Member states have agreed to further reduce tariffs by 80% in 1996, 90% in 1998, to zero tariffs by the year 2000. Though South Africa's trade with the rest of Africa amounted to only 31.7% of its global trade in 1993, membership of COMESA will open new markets for products which are currently uncompetitive in global markets. (Comments by Dr Bingu Wa Mutharika, Secretary General of COMESA, WM. 21/9/95).

APPENDIX 3

Intra-Regional and Extra-regional Trade – SADC, 1993

	EXPORTS (US\$mn)		IMPORTS (US\$mn) (trade intensity index)		TOTAL TRADE (US\$mn)	
ANGOLA	(ES/E) (%)	0.08	(MS/M) (%)	5.06	(ES+MS)/ (E+M) (%)	1.55
MALAWI	(ES/E) (%)	22.56	(MS/M) (%)	57.50	(ES+MS)/ (E+M) (%)	42.18
MAURITIUS	(ES/E) (%)	1.16	(MS/M) (%)	13.51	(ES+MS)/ (E+M) (%)	7.99
M'ZAMBIQUE	(ES/E) (%)	11.72	(MS/M) (%)	47.38	(ES+MS)/ (E+M) (%)	41.70
SACU	(ES/E) (%)	8.14	(MS/M) (%)	1.71	(ES+MS)/ (E+M) (%)	5.31
TANZANIA	(ES/E) (%)	2.10	(MS/M) (%)	3.92	(ES+MS)/ (E+M) (%)	3.45
ZAMBIA	(ES/E) (%)	3.82	(MS/M) (%)	55.84	(ES+MS)/ (E+M) (%)	26.03
ZIMBABWE	(ES/E) (%)	34.01	(MS/M) (%)	31.89	(ES+MS)/ (E+M) (%)	32.78
TOTAL SADC	(ES/E) (%)	7.83	(MS/M) (%)	9.24	(ES+MS)/ (E+M) (%)	8.48

Sources: Cattaneo, 1998b.

Note: ES and MS are exports to and imports from SADC respectively;
ER and MR are exports to and imports from the ROW respectively;
while E and M are total exports and imports.

SADC COUNTRIES' INTRA-REGIONAL AND EXTRA-REGIONAL TRADE, INCLUDING INTRA-SACU TRADE, 1993

	EXPORTS (US\$mn)		IMPORTS (US\$mn)		TOTAL TRADE (US\$mn)	
SACU	ES	7058.96	MS	5483.96	(ES+MS)	12542.92
	ER	21289.31	MR	17858.42	(ER+MR)	39147.73
	E	28348.28	M	2334.37	(E+M)	51690.65
	(ES/E) (%)	24.90	(MS/M) (%)	23.49	(ES+MS)/ (E+M) (%)	24.27
TOTAL SADC	ES	7681.88	MS	7673.15	(ES+MS)	15355.03
	ER	29516.83	MR	24539.79	(ER+MR)	54056.63
	E	37198.72	M	32212.94	(E+M)	69411.66
	(ES/E) (%)	20.65	(MS/M) (%)	23.82	(ES+MS)/ (E+M) (%)	22.12

Source: Cattaneo, 1998b

APPENDIX 4

INTRA-INDUSTRY TRADE SACU-ROW and SACU-ZIMBABWE

Sector	SA - ROW	SACU - Zim
Meat processing	42.72	92.32
Dairy products	83.21	26.27
Fruit and Vegetable canning	13.30	72.58
Vegetable and animal oils and fats	30.33	10.96
Grain mill products	51.97	72.41
Confectionery	70.52	74.99
Food products nec	59.52	57.55
Prepared animal feed	59.93	68.87
Soft drinks and carbonated waters	11.91	39.66
Spinning and weaving of textiles	62.70	65.45
Made up textile goods	48.29	17.10
Knitting mills	54.47	75.62
Clothing	93.42	37.53
Sawmills	78.46	27.68
Wooden containers	87.61	71.42
Wood and cork products nec	71.36	51.94
Wooden furniture and fixtures	30.57	26.75
Pulp, paper and paperboard	46.36	13.89
Paper containers	11.43	57.20
Industrial chemicals	88.22	4.50
Fertilisers and pesticides	88.67	7.22
Synthetic resins and plastic materials	37.06	2.90
Paints, varnishes and lacquers	56.41	29.17
Medicinal and pharmaceutical preparations	10.58	46.54
Other chemical products	26.36	10.02
Miscellaneous products of petroleum and coal	51.90	85.90
Tyres and tubes	60.93	32.88
Other rubber products	18.23	26.23
Other plastic products	36.89	13.42
Other non metallic mineral products	98.00	58.81
Iron and steel basic industries	21.33	31.64
Non ferrous metal basic industries	39.66	42.45
Cutlery, hand tools and general hardware	39.97	18.36
Furniture and fixtures of metal	54.25	83.80
Structural metal products	27.84	85.25
Other fabricated metal products	72.25	88.56
Engines and turbines	22.75	17.93
Agricultural machinery	17.97	82.47
Special industrial machinery	21.23	12.57
Office and accounting machinery	8.35	18.83
Other non electrical machinery	29.48	7.76
Electrical industrial machinery	16.36	10.47
Radio, television and communication equipment	11.68	27.36
Electrical appliances and housewares	15.67	29.97
Other electrical apparatus	27.97	53.69
Railroad equipment	48.18	37.73
Motor vehicles	22.82	15.66
Motorcycles	23.26	60.78
Transport equipment nec	12.19	37.10
Total manufacturing	74.41	49.25

Source: Cattaneo, 1998b

APPENDIX 5

Indicators on actual and potential SADC 7 export to SACU, 1995

Rank	Abbreviated product description	SACU imports from SADC 1995 US\$ million	SADC exports to world 1995 US\$ million	SACU imports from world 1995 US\$ million	Potential Trade
34	Live animals	2.5	28	10	7.5
9	Meat, meat preparations	4.1	97	196	92.9
44	Diary products, bird eggs	4.7	6	39	1.3
14	Fish, crustaceans, mollusc	5.6	214	66	60.4
25	Cereals, cereal prepatns	13.6	20	465	6.4
13	Vegetables and fruit	6.5	71	112	64.5
21	Sugar, sugar preptns, honey	11.1	493	27	15.9
8	Coffee, tea, cocoa, spices	11.3	286	117	105.7
24	Animal feed stuff	17.5	24	151	6.5
53	Misc. edible products etc.	1.2	1	69	-0.2
59	Beverages	0.2	1	106	0.8
15	Tobacco, tobacco manufact	37.6	700	64	26.4
28	Hides, skins, furskins, raw	0.7	22	16	15.3
22	Oil seed, oleaginus fruit	7.6	26	70	18.4
51	Crude rubber	1.9	3	129	1.1
18	Cork and wood	20.3	37	131	16.7
38	Pulp and waste paper	0.1	9	53	8.9
5	Textile fibres	35.7	191	204	155.3
10	Crude fertilizer, mineral	7.4	88	122	80.6
17	Metaliferous ore, scrap	17.2	47	187	29.8
12	Crude animal, veg, materl.	2	82	81	79
23	Coal. Coke, briquettes	1.9	25	45	23.1
1	Petroleum, petrol products	0.2	3365	2775	2774.8
61	Gas, natural, manufactured	0	24	0	0
63	Animal oils and fats	0	0	45	0
57	Fixed veg, fats and oils	0.6	1	227	0.4
55	Animal veg, fats, oils, nes	0.1	1	45	0.9
54	Organic chemicals	1	1	905	0
49	Inorganic chemicals	1.5	3	232	1.5
47	Dyes, colouring materials	0.4	4	211	3.6
46	Medicinal, pharm products	2.9	5	537	2.1
52	Essential oils, perfumes, etc.	0.6	2	149	1.4
42	Fertilizer except GRP272	0.1	6	47	5.9
58	Plastics in primary form	0.5	1	543	0.5

60	Plastic non primary form	0.2	0	192	-0.2
50	Chemical materials nes	1.1	3	535	1.9
20	Leather, leather goods	5	27	98	22
43	Rubber manufactures nes	4.7	6	261	1.3
27	Cork, wood manufactures	10.2	17	73	6.8
40	Paper, paperboard, etc.	5.5	9	534	3.5
6	Textile yarn, fabric etc.	20.7	158	744	137.3
3	Non-metal mineral manfct	15	264	649	249
4	Iron and steel	5	225	417	220
2	Non ferrous metals	9.3	943	325	315.7
19	Metals manufactures. Nes	17	29	564	12
30	Power generating machines	1.8	15	599	13.2
32	Special indust. Machinery	6.7	14	1813	7.3
56	Metal working machinery	0.7	1	293	0.3
41	General industrial machines	2.6	7	1823	4.4
39	Office machine	0.3	9	1346	8.7
45	Telecomm, sound equipment etc.	1.7	5	1022	3.3
29	Elec mach appar, parts. Nes	8.8	15	1767	6.2
35	Road vehicles	5.6	10	2877	4.4
37	Other transport equipment	1.4	9	491	7.6
62	Prefab buildings, ftng etc.	0.2	0	44	-0.2
26	Furniture bedding etc.	11.6	17	65	5.4
36	Travel goods, handbags etc.	3.6	10	40	6.4
7	Clothing and accessories	27.9	948	139	111.1
33	Footwear	11.8	13	179	1.2
31	Scientific equipment nes	1	14	630	13
16	Photo, apparat, nes, clocks	0.1	52	263	51.9
11	Misc manufctrd goods nes	3.2	88	878	84.8
67	Mail not classed by kind		1		
64	Coin non gold noncurrent		0	0	
48	Gold non-monetary excl ores	0.7	26	4	3.3

Note: If SACU's imports from the world are smaller than SADC's exports to the world then we subtract SACU's imports from SADC from SACU's imports from the rest of the world.

If SACU's imports from the world are greater than SADC's exports to the rest of the world then we subtract SACU's imports from SADC from SADC's exports to the world.

Data source: von Kirchbach, F and Roelofsen, H (1998) African development in a Comparative Perspective, United Nations Conference on Trade and Development, United Nations, Geneva.

APPENDIX 6

Evans Simulation Model

PERCENTAGE GROWTH IN EXPORTS, IMPORTS AND BALANCE OF PAYMENTS.
SELECTED SECTORS,
NO GDP GROWTH OR ROW PRICE EFFECT; SADC TARIFF REMOVED

MOZAMBIQUE

	%M	%E	BOP
Agriculture	3.98	8.72	0.39
Mining	0	0	0
Food, tob, bev.	25.75	183.57	-5.53
Textile	59.25	57.15	-0.98
Clothing	67.93	96.41	-0.5
Other manuf	6.8	8.25	-8.14
Total or average	11.39	17.45	-14.75

SACU

	%	%	Bal of payment
Agriculture	7.44	8.72	-0.19
Mining	1.05	1.59	0.47
Food, tob, bev.	158.42	119.06	-10.74
Textile	50.78	57.15	10.39
Clothing	104.75	96.41	2.38
Other manuf	10.36	6.42	22.3
Total or average	42.51	19.9	24.6

TANZANIA

	%	%	Bal of payment
Agriculture	7.49	8.72	0.26
Mining	1	0	0
Food, tob, bev.	39.43	18.49	-0.3
Textile	37.4	57.15	-0.05
Clothing	8.09	0	0
Other manuf	0.84	13.87	0.12
Total or average	9.36	10.41	0.03

ZAMBIA

	%	%	Bal of payment
Agriculture	7.58	8.72	0.46
Mining	1.94	1.59	-0.16
Food, tob, bev.	40.43	67.19	-2.72
Textile	70.78	57.15	-1.79
Clothing	87.75	96.41	-1.13
Other manuf	5.96	9.44	-6.93
Total or average	10.4	19.46	-12.25
BOP in Rand Billions			

ANGOLA

	%M	%X	BOP
Agriculture	35.24	8.72	-1.34
Mining	5.86	1.59	0
Food, tob, bev.	42.97	296.58	-3.26
Textile	27.68	57.15	-0.24
Clothing	25.61	96.41	-0.03
Other manuf	8.99	1.74	-0.58
Total or average	28.06	3.2	-5.45

MALAWI

	%	%	Bal of payment
Agriculture	10.3	8.72	-0.17
Mining	1.66	1.59	0
Food, tob, bev.	32.8	67.34	4.54
Textile	78.67	57.15	-2.29
Clothing	89.35	96.41	-0.26
Other manuf	6.21	20.25	-3.13
Total or average	13.68	44.82	-1.31

MAURITIUS

	%	%	Bal of payment
Agriculture	8.47	8.72	-4.02
Mining	0.21	1.59	-0.01
Food, tob, bev.	15.97	18.49	2.71
Textile	0.57	57.15	6.64
Clothing	44.63	96.41	0.6
Other manuf	2.84	12.46	-1.37
Total or average	6.4	30.83	4.55

ZIMBABWE

	%	%	Bal of payment
Agriculture	8.05	8.72	5.26
Mining	1.83	1.59	-0.3
Food, tob, bev.	33.83	45.07	7.06
Textile	76.17	57.15	-9.04
Clothing	135.55	96.41	-0.79
Other manuf	6.71	7.95	-5.24
Total or average	10.93	11.99	-3.05

APPENDIX 7

World Imports From BLNS countries, based on Average 1991 to 1994 Data in US\$ million

Botswana-United States	12.25		Botswana-Peru		1.5
Lesotho	52		Lesotho		0
Namibia	28.25		Namibia		0
Swaziland	30		Swaziland		0
Botswana-Canada	0		Botswana-China		2.5
Lesotho	2.5		Lesotho		0.25
Namibia	15.75		Namibia		0.25
Swaziland	10.75		Swaziland		1.75
Botswana-Australia	0		Botswana-Philippine		0.5
Lesotho	0		Lesotho		0
Namibia	1		Namibia		0
Swaziland	1.5		Swaziland		0
Botswana-Japan	8.25		Botswana-singapore		5
Lesotho	0		Lesotho		0
Namibia	0		Namibia		0
Swaziland	8.25		Swaziland		0
Botswana-New Zealand	0		Botswana-Malaysia		0
Lesotho	0		Lesotho		0
Namibia	0		Namibia		0
Swaziland	1.25		Swaziland		4
Botswana-Austria	0		Botswana-Thailand		2.75
Lesotho	0		Lesotho		0
Namibia	10		Namibia		0
Swaziland	0.5		Swaziland		39
Botswana-United Kingdom	39.5		Botswana-Pakistan		0
Lesotho	4.5		Lesotho		0
Namibia	35		Namibia		0
Swaziland	67.5		Swaziland		0.5
Botswana-Belgium	2		Botswana-Hong Kong		0.25
Lesotho	4.75		Lesotho		0
Namibia	16.25		Namibia		0.5
Swaziland	3		Swaziland		0.5
Botswana-Finland	0		Botswana-India		0
Lesotho	0		Lesotho		1.25
Namibia	0		Namibia		0.5
Swaziland	5		Swaziland		2

Botswana-Germany		28.25	Botswana-Malawi		6
Lesotho		10	Lesotho		0
Namibia		26.75	Namibia		0
Swaziland		7.5	Swaziland		0
Botswana-France		1.75	Botswana-Mozambique		0
Lesotho		2.25	Lesotho		0
Namibia		15.75	Namibia		0
Swaziland		34.75	Swaziland		0
Botswana-Denmark		0	Botswana-South Africa		225
Lesotho		0	Lesotho		143
Namibia		0.75	Namibia		1158
Swaziland		1.25	Swaziland		400
Botswana-Greece		0.5	Botswana-Tanzania		0
Lesotho		0	Lesotho		0
Namibia		9.25	Namibia		0
Swaziland		0	Swaziland		0
Botswana-Ireland		0	Botswana-Zambia		3
Lesotho		0	Lesotho		0
Namibia		0	Namibia		0.75
Swaziland		2	Swaziland		3.75
Botswana-Italy		13.25	Botswana-Zimbabwe		45.75
Lesotho		0.25	Lesotho		0
Namibia		80	Namibia		2
Swaziland		3.75	Swaziland		9.25
Botswana-Netherlands		10.75	Botswana-Kenya		0
Lesotho		0.25	Lesotho		0
Namibia		6.75	Namibia		0
Swaziland		5.5	Swaziland		2.25
Botswana-Norway		80	Botswana-Uganda		0
Lesotho		0	Lesotho		0
Namibia		0	Namibia		0
Swaziland		1	Swaziland		0
Botswana-Portugal		0.25	Botswana-Mauritius		0
Lesotho		0	Lesotho		0
Namibia		2.25	Namibia		0
Swaziland		7.75	Swaziland		3
Botswana-Spain		2.5	Lesotho-Botswana		0
Lesotho		0.25	Namibia		0
Namibia		68.5	Swaziland		0
Swaziland		1.5	South Africa		2507

Botswana-Sweden		0		Botswana-Lesotho		0
Lesotho		0		Namibia		0
Namibia		0		Swaziland		0
Swaziland		3		South Africa		805
Botswana-Switzerland		1560		Botswana-Namibia		0
Lesotho		1.5		Lesotho		0
Namibia		47.25		Swaziland		0
Swaziland		0		South Africa		1035
Botswana-Brazil		0		Botswana-Swaziland		0
Lesotho		0		Lesotho		0
Namibia		0		Namibia		0
Swaziland		0.25		South Africa		560

Source: IMF Direction of Trade Statistics, 1991 to 1997

APPENDIX 8

Reproduction of Model Results with Additional Information

Direction of Trade with Composite Variables

Table 5.3a¹ Model Composite Explanatory Variables

Variable	Coefficient	t-Ratio
Constant	-7.7040	-11.697
$\text{Log} \text{GDP}_i - \text{GDP}_j $	-0.64177	-19.595
$\text{Log}(\text{GDP}_i * \text{GDP}_j)$	1.0288	22.143
$\text{Log} \text{GNPPC}_i - \text{GDPPC}_j $	-0.15785	-1.350
$\text{Log}(\text{DIST}_{ij})$	-0.39287	-3.814
ADJ_{ij}	-0.14867	-1.269
LANG_{ij}	1.0401	6.462
$\text{Log}(\text{POP}_i * \text{POP}_j)$	-0.14477	-2.931
$\text{Log}(\text{AREA}_i * \text{AREA}_j)$	-0.25404	-8.946

No of Observations = 879

Log-likelihood test = -1928.589

Log - likelihood ratio = - 1665.751

¹ 1b is not reproduced because it is the same as 1a excepts that few variables are excluded. The log-likelihood tests are also similar.

Table 5.3 c

Estimating Potential Trade with Composite Dependent Variable (The sum of imports plus exports)

Variable	Coefficient	t-Ratio
Constant	-6.1157	-8.141
$\text{Log} \text{GDP}_i - \text{GDP}_j $	-0.53565*	-15.304
$\text{Log}(\text{GDP}_i * \text{GDP}_j)$	1.0177*	21.619
$\text{Log} \text{GNPPC}_i - \text{GDPPC}_j $	-0.6351	-0.648
$\text{Log}(\text{DIST}_{ij})$	-0.78568*	-4.963
ADJ_{ij}	0.828	0.432
LANG_{ij}	1.0768*	5.631
$\text{Log}(\text{POP}_i * \text{POP}_j)$	-0.12756*	-5.672
$\text{Log}(\text{AREA}_i * \text{AREA}_j)$	-0.15403*	-5.000
MERC	-0.15300	-1.298
ASEAN	2.2185*	6.081
COMESA	-0.13241*	-2.984
ISLAND	0.4259*	2.192

No of observations: 703

Total No of Variables = 14

Log-likelihood ratio = -1324.742 (anti-log = 0.266)

Log likelihood tests = -1635.733 (anti log= 0.194)

Table 5.5

**Estimating the Model of Bilateral Trade based on a World Sample
(including specifically EU and Intra-EU Trade)**

Variable	Coefficient	t-ratio
Constant	-11.141	-16.321
LogGDP1	1.0323	30.241
LogGDP2	0.69622	18.0866
LogDIS	-0.44025	-5.484
ADJ	0.82052	5.378
LAN	0.70147	5.539
SADC	0.65683	2.996
MER	-0.15335E-02	-1.572
ASEAN	0.72792	2.671
COMESA	0.32279	0.900
ISL	0.27695E-02	1.629
LogPOP1	0.12532	2.418
LogPOP2	-0.45849	-8.853
LogAREA1	-0.23424	-6.747
LogAREA2	-0.23827	-8.195

Number of Observations 1565
Total Number of Variables 18
Log-likelihood test -3654.530 (anti-log = 0.025)
Log-likelihood ratio -2360.873 (anti-log=0.094)

Table 5.5c with Substituted Variables

Variable	Coefficient	t-ratio
Constant	-8.5764	-18.602
LogGDP1	1.1698	35.295
LogGDP2	1.0723	29.000
Log DIS	-0.99759	-14.457
ADJ	-0.70848E-01	-0.550
LAN	0.64507	5.771
COMESA	-0.70193E-02	-0.031
ISL	0.45309E-03	0.299
LogPERCAP1	-0.15931	-3.751
LogPERCAP2	-0.60060	-20.530
LogAREA1	-0.19707	-6.617
LogAREA2	-0.47188	-25.656

Nobs = 1565

No of Variables = 14

Log-likelihood test -2474.667

Log - likelihood ratio - 3654.530

APPENDIX 9

Comparative Results

Gravity Model Estimates: SSA and other Low Income Countries										
(Averages 1980 and 1986-90)										
			Imports*				Exports*			
			1980 – 1994		1986 – 1990		1980 – 1984		1986 – 1990	
Variables			Coef.	t-Stat	Coef.	t-Stat	Coef.	t-Stat	Coef.	t-Stat
Standard Gravity Model										
Constant			-6.72	-3.11	-11.92	-13.8	-8.85	-10.36	-14.04	-16.23
Log (Distance _{ij})			-2.04	-24.09	-1.92	-21.62	-1.82	-20.83	-1.89	-21.22
Border _{ij}			1.39	4.21	0.57	1.64	1.48	4.36	0.84	2.42
Island _i Island _j			0.65	2.61	1.08	4.13	-0.02	-0.09	0.52	2
Log(Area _i Area _j)			-0.45	-18.67	0.24	11.12	-0.48	-19.23	0.13	6.19
Log(GDP _i GDP _j)			1.84	53.74	0.44	23.18	1.86	52.58	0.75	39.44
Log(GDPPC _i GDPPC _j)			-0.23	-1.35	1.22	24.35	-0.19	-3.48	0.97	19.35
Linder: log(GDPPC _i - GDPPC _j)			0.2	4.18	0.62	11.96	0.09	1.77	0.66	12.7
Language _{ij} :										
English			1.1	5.31	1.53	7.06	1.18	5.54	1.76	8.14
Spanish			0.95	3.59	1.28	4.68	1.53	5.66	1.4	5.13
French			2.7	7.97	0.33	0.91	2.96	8.51	1.22	3.38
Arabic			0.81	2.48	-1.04	-3.01	1.24	3.68	-0.41	-1.19
Portugese			2.62	2.02	0.25	0.18	2.79	2.11	-0.26	-0.18
Swahili			-0.49	-0.42	0.04	0.03	-1.34	-1.1	-0.22	-0.17
Pseudo R square			0.1383		0.1133		0.1343		0.128	
Number of Observations			6,600		6,600		6,600		6,600	

Source: Elbadawi, 1997:

*The dependant variables are estimated in logs (for values > 0)

Border_{ij} = 1 if country i and j share a common border (Island_i = 1 if country i is an Island)

Maximum Likelihood Estimates of the Tobit Gravity Model for Countries with GDP per capita < 3,000 as Reporters				
	Imports		Exports	
	w/African	w/o African	w/ African	w/o African
African dummies				
African ⁱ (=1)	-.34 (.08)**		.08(.103)	
African oil exp (=1)	-.06(.132)		-1.07(.165)**	
African ⁱⁱ (=1)	.60(.319)		.78(.318)*	
African ⁱⁱⁱ dist ⁱⁱⁱ	-0.07(.196)		-.11(.196)	
Proximity				
Distance ⁱⁱ	-1.66(.07)**	-1.75(.077)**	-1.69(.074)**	-1.65(.080)**
Border ⁱⁱ (=1)	.68(.23)**	.54(.308)	.89(.23)**	.89(.309)**
Reporter				
GDP ⁱ	.82(.031)**	.88(.036)**	1.31(.040)**	1.53(.050)**
GDPPC ⁱ	.14(.048)**	-.098(.057)	-.38(.051)**	-.63(.058)**
Area ⁱ	-.18(.028)**	-.18(.033)**	-.44(.037)**	-.53(.047)**
Island ⁱ (=1)	-.01(.083)	.06(.045)	.20(.095)*	.22(.112)*
Partner				
GDP ^j	1.34(.025)**	1.28(.023)**	.97(.029)**	.94(.036)**
GDPPC ^j	-.08(.038)*	-.009(.045)	.08(.042)	.07(.048)
Area ^j	-.28(.018)**	-.214(.023)**	-.19(.021)	-.19(.025)**
Island ^j (=1)	.33(.081)**	.505(.098)**	-.08(.089)	-.06(.108)
GDPPC ⁱ -GDPPC ^j	-.11(.05)*	-.029(.066)	-.11(.058)*	.03(.069)
Preferential				
ASEAN	.81(.278)**	.621(.291)*	1.45(.36)**	1.32(.37)**
LAFTA	.94(.25)**	.92(.263)**	1.59(.23)**	1.68(.24)**
CACM	3.26(.33)**	3.31(.37)**	3.37(.29)**	3.46(.26)**
Lome	.94(.173)**	.26(.208)	1.66(.157)**	1.20(.53)*

Language				
English	.49(.138)**	.73(.202)	.32(.144)*	.15(.213)
French	1.26(.183)**	.53(.55)	1.42(.202)**	1.47(.66)*
Spanish	.62(.155)**	.67(.162)**	.72(.18)**	.72(.18)**
Constant	1.59(.201)**	1.19(.24)**	1.67(.27)**	1.67(.27)**
# Countries (obvs)	54(5,130)	34(3,230)	33(3,135)	33(3,135)
s.e.	1.88	1.91	2.00	2.00
Pseudo R ²	.630	.646	.578	.578

Note: Standard errors in parenthesis,**(*) - significant at the 1% (5%) level

Source: Fourantan and Pritchett, 1993

APPENDIX 10

Ex Ante Results: Model using SACU as a set of reporter countries and their trade with partners.

Variable	Co-efficient	T-Ratio
Constant	-16.121	-18.886
Log (GDP _i)	1.1853	22.012
Log (GDP _j)	0.92866	19.399
Log (Distance)	-0.6270	7.612
Log (Pop _i)	-0.20355	2.466
Log (Pop _j)	0.129	0.022
Adj	0.505	2.748
Lan	1.1388	7.003
Comesa	1.5887	5.053
Island	0.15887	5.052
Log (Area _i)	-0.18012	-4.798
Log (Area _j)	-0.21124	-6.277

NO of Observations; 702

Log -likelihood test - -1711.835

Log -Likelihood ratio - -905.4752

APPENDIX 11

List of Countries in the Gravity Model

SADC:

Angola, Botswana, Lesotho, Malawi, Mauritius Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia, Zimbabwe, as (from September 1997, Seychelles and Congo not included in sample).

Africa

Burundi, Comoros, Djibouti, Ethiopia, Kenya, Rwanda, Somalia, Sudan, Uganda.

Asean Region

Indonesia, Malaysia, Philippines, Singapore, Thailand.

Other -Asia

India, Korea, Pakistan, Hong Kong, China, Japan.

Mercosur

Argentina, Brazil, Paraguay, Uruguay.

Other- Latin America

Colombia, Mexico, Nicaragua, Peru, Venezuela.

Western Europe

Austria, Belgium-Luxembourg, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

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