

Proximity, Regional Integration and Weak Trade among African Countries – Perspective from SADC

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TRAPCA Trade Policy Forum 2010

Abstract

A lot of efforts are being put into uniting Africa through regional integration. Simply put, regional integration is the vogue. But it seems not much consideration is given to economic underpinnings and potential gains from the efforts. Being contiguous should help African countries, but whether such stance is supported by empirical analysis is questionable. In this work therefore, we try to show what drives trade among African countries using South Africa, the SADC and the rest of Africa as instance. We then try to explore implications of this for region integration in the region.

I. Introduction

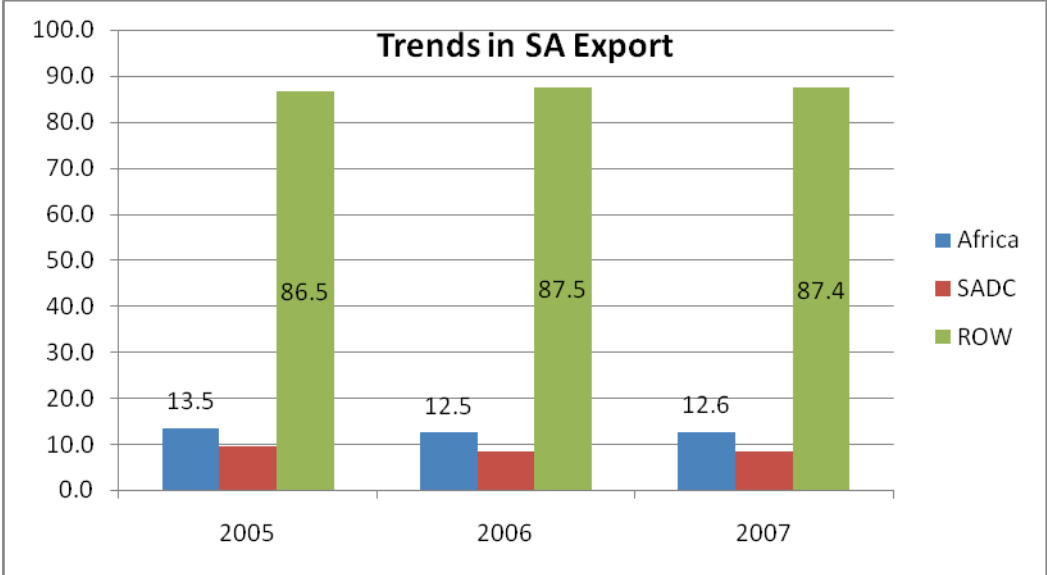
Increasingly, trade among contiguous countries is organized along regional trade agreements (RTAs). However, Africa's experience in regional integration is severally considered to have fallen short of the optimal. While RTAs have multiplied in the continent, intra-group trade among participating countries has been either epileptic or stagnant since 1980. Initially weak commitments by integrating countries contributed to these poor outcomes; but there is the probability that the poor outcomes have in turn impacted on commitment, leading to a vicious cycle in regional trade protocols. The ultimate losses are on output growth and welfare. The story is slightly different in some other parts of the developing world. While Africa's share of global trade has dipped between 1980 and 2008, Asia's trade share (driven mainly by China, India and South East Asia) has doubled over the same period. Likewise, while intra-group trade among Asian countries has increased substantially, that of Africa has remained epileptic or stagnant over the period. Interestingly, while regional integration has a long history in Africa, it is still trying to take root in developing Asia.

South Africa is uniquely placed among developing Africa to trade the most with its neighbours being the largest economy in sub Saharan Africa (SSA). It has a far more diversified economy than the rest of SSA and boasts higher output and better infrastructure than all its neighbours. Given the position of theory on proximity and regional integration effects on trade, the country should have replaced most European, North American and Asian sources of imports for other African countries. Unlike most other neighbouring African countries, both in SADC and other parts of Africa, its exports are very diversified and consists of a number of goods needed by poor African countries. However, as shown in Figure 1, after nearly three decades of regional integration in SADC, South Africa's major export destinations are still countries far out of Africa. In fact, South Africa's trade structure is such that there is high intra-industry trade, with the country importing and exporting same types of goods from other developed economies and importing little from Africa. Meanwhile, it has spent nearly two decades in intensive regional trade formation negotiations and institutionalization with other 13 countries in Southern Africa and has the oldest Customs Union in the World with another 4 countries. With its unique geographical position at the end of the southern hemisphere, there is need to question conventional wisdom on the impacts of proximity and regional integration efforts on South Africa's trade structure.

This paper intends to investigate this paradox. It holds the assumption that the negative effects of poor trade facilitation measures and weak output base on trade volumes between South Africa and its neighbours may more than offset the meager gains accruable from regional integration and proximity. It investigates this position using exports from South Africa to a sample of 23 African countries – 10 of which are in the SADC regional trade grouping. The analytical framework is the standard gravity model, augmented with selected measures of trade facilitation constructed by the authors from World Economic Forum Global Competitiveness Report and the World Bank's Doing Business Index. Definitely, there seems to be reason to question the position of gravity theory on distance for countries at the level of development as those in our sample, especially given South Africa's unique history and trade structure. But more critical for the purpose of this study is the question of the overall impact of the multiplied regional integration efforts ongoing in many parts of Africa. Have they impacted trade? Can they really

impact trade? If the major reason for establishing regional trade groupings is to improve trade, why have African regional integration arrangements (RIAs) not done so? What are the minimum conditions that may be needed to improve overall impacts of RIAs in Africa and how can those be achieved? Is there a role for trade facilitation or do we just take standard specification of the gravity model as being enough to explain trade among contiguous countries? The paper does not intend to answer all the questions; it simply sets out to raise issues for further debate on this critical subject.

Figure 1: Trends in SA Export



II. Regional Integration and Trade Facilitation in Africa: Some Stylized Facts

Intra-group trade in Africa is doubtless affected by historical ties. Two regions principally led intra-group trade growth in Africa between 1980 and 2005: Eastern Africa and French West Africa (the UEMOA). Within each of these groups, constituent countries share a lot of cultural affinity. French West African countries, for example, share long historical ties among themselves and between them and France. There are little language barriers to trade and other cultural ties are much stronger than they are in other parts of the continent. Likewise, Swahili remains a general East African language. Even though English language is the lingua franca in these places, there is little doubt the communal identity through a common language has helped in promoting trade within the region. Economic ties among these countries have also been longer than in some other parts of the continent. For example, the East African Community (EAC) and the UEMOA have had longer histories of economic relationship arising from social interactions than the more recent and artificial Economic Community of West African States (ECOWAS) and Economic and Monetary Community of Central Africa (CEMAC).

But there are also multiple obligations, memberships and allegiances. Presently, there exist multiple unserved (and indeed unserviceable) visions, interests, expectations and

responsibilities vested on regional integration projects within the continent. Commitments and timelines are not always respected by member countries of regional blocs in Africa. Consequently, it is not clear that regional integration in Africa has helped to substantially improve trade among African countries. It is acknowledged in the literature that membership in many RTAs can complicate administrative procedures raising trade facilitation costs. Multiplicity of rules from different RTAs strains institutions charged with administering trade agreements on such issues as customs procedures and technical standards. For African countries with weak institutions and capabilities for such complex administrative requirements as imposed by multiple commitments, the impacts on overall trade and development can be daunting. It is not surprising then that conclusions on the impact of regional integration on intra-group trade in Africa have been mixed. For example, while Cernat (2001) – working on SADC, COMESA and ECOWAS - found that African RTAs have positive impact on intra-RTA trade, World Bank (2000) and Yeats (1998) concluded that African regional blocs are potentially more trade diverting than others and have doubtful non-economic benefits. This is partly because as shown in Table 1, regional integration arrangements in Africa (as in a number of other regions of the world) often have mandates beyond merchandise trade.

Table 1: Other Mandates of Selected Regional Integration Arrangements

RIA/Item	NAFTA	EU-South Africa	MERC OSUR	CARI COM	AFTA	SADC	COM ESA
Standards	Yes	No	Yes	Yes	Yes	Yes	Yes
Transport	No	No	Yes	Yes	Yes	Yes	Yes
Customs cooperation	Yes	No	Yes	Yes	Yes	Yes	Yes
Services	Yes	No	Yes	Yes	Yes	No	Yes
Intellectual property	Yes	Yes	No	No	No	Yes	No
Investment	Yes	No	Yes	Yes	Yes	Yes	Yes
Dispute settlement	Yes	Yes	Yes	Yes	No	Yes	Yes
Labour	Yes	No	Yes	Yes	No	Yes	Yes
Competition	Yes	Yes	Yes	Yes	No	Yes	Yes

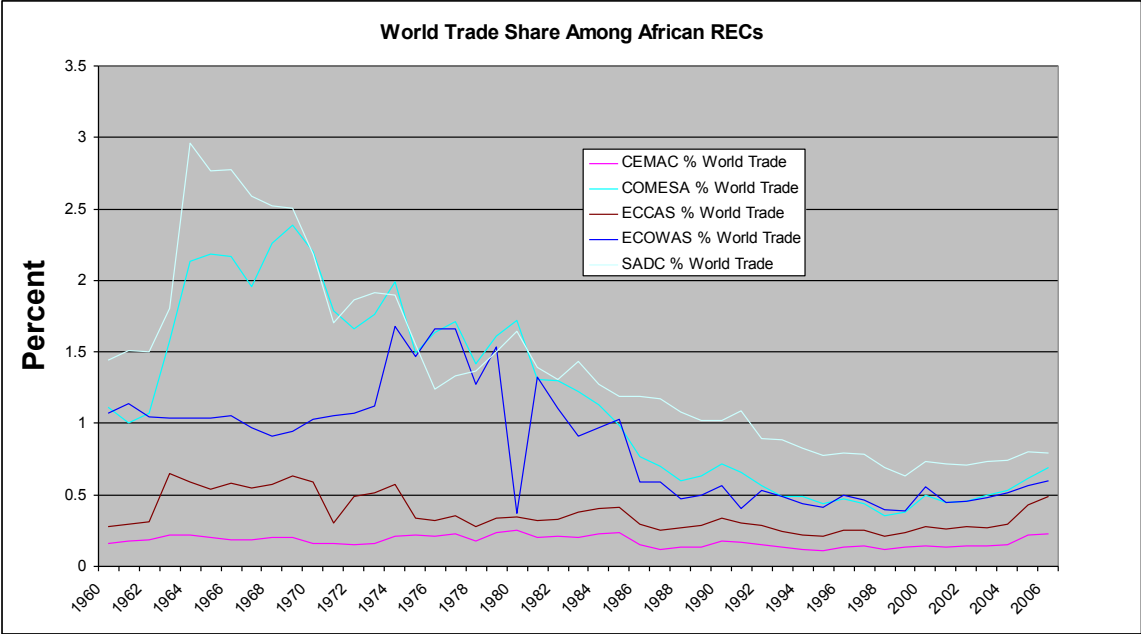
Source: World Bank 2005

Regional integration projects the world over are heavily impacted by the state of infrastructure among integrating countries. And it is known that infrastructure is weak in many parts of Africa. This includes both human and physical infrastructure. Transportation network across countries in Africa is probably one of the leanest globally and communication infrastructure is skeletal and costly. Social infrastructure and institutions for the effective actualization of the goals of regional trade initiatives are also weak. Cultural barriers, including language also stand in the way of trade agreements.

Fact is, most regional integration arrangements (RIAs) in Africa reflect not just a desire to increase trade, but more so, the need for improved bargaining power and reduced political tensions among contiguous countries. SADC for example originated in the 1980s as a coalition opposed to apartheid in South Africa and only with progress in the first objective was the creation of free trade area given precedence. Ostensibly in reaction to the relatively high number of conflicts in the region, many other African RIAs are as active in conflict resolution as in trade liberalization. Consequently, while increases in merchandise trade may be meager, participating countries of these RIAs evaluate the success of their efforts in terms of the extent to which conflict has been reduced (World Bank, 2005).

Despite the above though, it remains a fact that the principal objective of RIAs is economic – increasing trade and potentially improving welfare among participating countries remain strategic objectives. Even with significant successes in non-economic objectives, the extent to which an RIA equally improves economic well-being among participating countries is considered critical. Besides improving trade among participating countries, effective trade facilitation, whether led by regional or national reforms, is expected to improve overall trade with the rest of the world and potentially increase the share in global trade of a regional economic grouping. For nearly all African regional economic communities (RECs) though, there has been a race to the bottom in global trade share since early 1980 as shown in Figure 2. Indeed, trade share has become so miniscule that there is hardly any African regional grouping with global trade share up to 1 percent as opposed to SADC’s and COMESA’s trade share of nearly 3 percent and 2.4 percent respectively in the mid 1960s.

Figure 2: World Trade Share among Regional Integration Arrangements

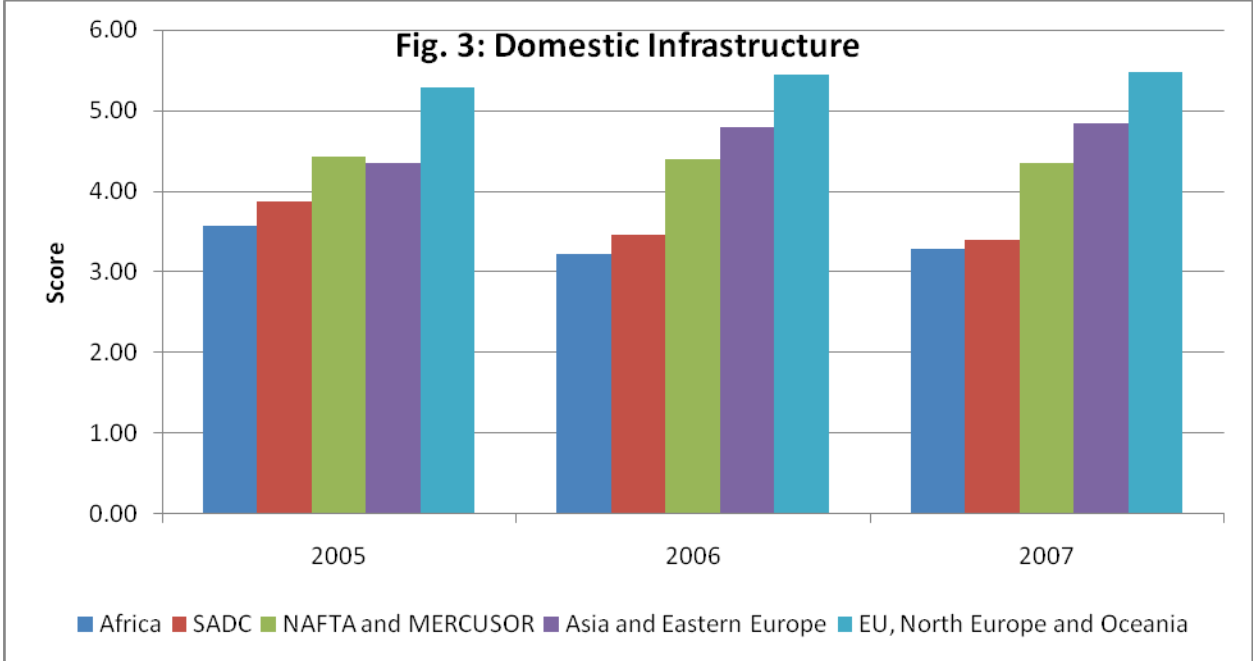


Source data: UNCTAD

It is not a stretch of imagination to propose that poor trade facilitation measures alongside a weakening output base have largely contributed to the dwindling trade fortunes in Africa. For example, constructing a domestic infrastructure measure from a pool of three indicators – overall

infrastructure level, quality of electricity infrastructure and quality of the educational system – from the World Economic Forum’s (WEF) Global Competitiveness Report (GCR), Figure 2 shows the relative performance of African (and SADC) countries relative to other selected regions of the world. As can be quickly observed from Figure 3, the gap between Africa and other regions in terms of domestic infrastructure keeps widening by the year. Between 2005 and 2007, Africa’s average fell closer to the score of 3 while other regions improved to almost a score of 6 (the lowest score is 1 while the highest score is 7). The same could be said of several other indicators and measures in most benchmarking results involving the region.

Figure 3: Performance of Selected Regions in Domestic Infrastructure Measure in the GCR



Source: WEF GCR, Various Issues

III. The Literature

Empirical studies on trade facilitation, even though growing, are very recent and generally inadequate (Njinkeu et al 2008). Maur (2008), underscoring the relationship between regional integration and trade facilitation, takes a backward assessment of the implications of regional integration on trade facilitation. Acknowledging that most regional trade agreements presently incorporate trade facilitation dimensions, he tried to evaluate the implications of trade facilitation reforms at the three levels they are usually undertaken – national, regional and multilateral. The aim of the paper was to investigate how regional initiatives can contribute to trade facilitation reform, with the intention of determining where the optimal level of policy intervention lies among the three. The work assumes that in some instances regional solutions, as opposed to national or multilateral ones, can be quite more helpful in solving trade facilitation challenges among contiguous countries. To do so, he applies a ‘market failure’ test that determines whether a regional public intervention will deliver a welfare maximizing reform, particularly when national remedies to market failures are inadequate. Secondly, following Sauve and Zampetti (2000), he applies a ‘subsidiarity test’ that tries to match the political jurisdiction of the

responding government to the economic domain of benefits that accrue from the public good which market has failed. For the first test, he insists that regional solutions should be sought when the failing markets correspond to some well-defined set of nations. For the second, he observes that transaction costs to provision of regional trade facilitation are optimized when the most appropriate participants partake in such provision (Arce and Sandler, 2002). He concludes that the need to address coordination and capacity failures, which can occur when disparate national governments independently tackle regional trade facilitation challenges, there is need for care in the choice of operational platform for delivering on regional trade facilitation reforms. In this respect, regional collaboration will not exactly deliver the same results as regional integration. The work attempted to explain why some outcomes of integration-led trade facilitation reforms have not delivered on this theoretical ideal.

Furthering the debate on regional facilitation measures vis-à-vis unilateral liberalization and/or facilitation programmes, Pitigala (2005) studied the seven South Asian countries in SAPTA – Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka¹. The author first selected various definitions of ‘natural trading partner’ including Lipsey-Summers ‘volume of trade’, geographical proximity and trade complementarity. On the volume of trade criterion, the work finds that only Bhutan and Nepal which have strong trading links with India on account of being landlocked qualify for such characterization. The other countries have overall very low intra-group shares to qualify as natural trading partners. He equally demonstrated that the countries do not qualify on the basis of the second criterion – geographical proximity. He showed that the SAPTA countries all demonstrate tendency to trade intensively with partners outside the region. This was either due to comparative endowments or long historical, religious, cultural or other affiliations. On trade complementarity, using revealed comparative advantages (RCA) indices, he found that India and Pakistan have indices greater than one, indicating that their exports complement the imports of a number of countries in the region. RCA indices of other countries in the region showed limited complementarity. The study concludes that the countries in SAPTA can be characterized only moderately as natural trading partners. Given that much of the factors that led to this characterization are entrenched in the history, previous policies and other impediments in the region, the author concludes that the trade structures that have evolved among these neighbours may not facilitate rapid increase in intra-group trade. In contrast, he thinks there is evidence that previous unilateral trade liberalization efforts by individual countries yielded more pronounced positive results in boosting intra-group trade. He therefore encouraged that these countries should continue the process of unilateral trade liberalization as it would more likely facilitate export diversification. This way, they would hopefully also evolve new comparative advantages and complementarities that would support regional integration.

Dennis (2006) also assesses intra-group trade and trade facilitation measures, with a slightly different bent from Pitigala’s work. He studies the Middle East and North Africa (MENA) region and focuses on the development prospects of trade agreements and facilitation measures that have been put in place in the region. The assessment of the impact of trade agreements was two-pronged; an analysis of the welfare gains accruable from the myriad regional trade agreements that are popping up in the region and a comparison of these with the gains accruable from trade

¹ SAPTA members have in principle agreed to fully implement a free trade area transforming the group to SAFTA (South Asian Free Trade Area) beginning 2006 and full implementation completed between 2009 and 2013

agreements with the European Union. The study employs the Global Trade Analysis Project (GTAP) computable general equilibrium model with modifications to capture trade facilitation through technical progress in trading activities in line with Hertel et al (2001). This modification allows for inputting higher indirect (iceberg) costs owing to longer and more cumbersome transit processes in trade between any two countries. He equally incorporates new insights from Fox et al (2003) and OECD (2003) allowing for direct (tax component) cost imputation. For the latter, he uses estimates from a survey by Zarrouk (2003) that calculated inefficiencies in trade facilitation as a proportion of the value of traded goods. The work also assumed that each day saved in shipping time be equal to 0.5 percentage point reduction in ad valorem tariffs (as found by Hummels, 2001 probit estimation). The work finds that intra-group integration and integration with the EU have positive impact welfare in the region. However, the welfare gains from integrating with the EU were about twice those from within-group integration. Adding trade facilitation measures helped to further shore up the gains to about three times their original values. For example, the welfare gains from integrating with the EU were estimated to increase by 0.82 percent of GDP (from \$1.8 billion to \$7.2 billion) while gains to intra-group integration were estimated to increase by 0.1 percent of GDP (from \$913 million to US\$3 billion)

Baller (2007) examined the trade facilitation question from a more micro and sectoral perspective. Given the position of several firm-level surveys that identify technical regulations, rules of origin and customs procedures as key non-tariff barriers, his research focuses on greater enquiry into the nature of and solutions to technical regulations (termed technical barriers to trade in the WTO). He picked two indicators within the body of technical regulations – the effects of TBT liberalization in the form of harmonization and mutual recognition agreements (MRA) for testing procedures. The study first structured a theoretical position derived from Melitz (2003) to formalize expected impacts of harmonization and MRAs programmes and applied the theory to the data. The empirical work in turn examines sectoral impacts of TBT liberalization on both participating and excluded countries using a two-stage gravity model. The major value that the work attempted to add is to situate the empirical analyses on more firmly grounded theoretical analysis – a major gap in gravity models. Identifying two potential channels for increased trade flows from endogenous firm selection process (an intensive margin reflecting the volume of exports by each exporting firm and an extensive margin reflecting the proportion of firms exporting), the work analyzed surveys of telecoms and medical devices industries. The first part of the findings on MRAs is consistent with apriori expectations namely that they do have positive impact on both export probabilities and trade volumes for partner countries. The impact of harmonization on the other hand was not as significant for integrating countries and did not seem to matter for excluded developing countries, but was positive and huge on excluded developed countries. Equally, the probability that harmonization would bring in new exporting firms was higher than the probability that existing firms will increase volume of their exports.

Some other works use general equilibrium models (the most pronounced of which are GTAP CGE models). Some in this category include APEC (1999), Fox et al (2003), OECD (2003) and Hertel and Keeney (2005). APEC (1999) blazed the trail in this respect, with the work on its member countries. It finds that the members' income can be boosted by up to 0.4 percent of its 1997 value (about \$75 billion) by improving trade liberalization and facilitation measures. Fox et al (2003) accounted for both direct (tax) and indirect (iceberg) costs of trade facilitation costs between Mexico and the US and find \$1.8 billion and \$1.4 billion annual welfare gains for the Mexican and US economies respectively. In turn OECD (2003) puts estimated gains from

reductions in trade transactions costs of 1 percent of value of global trade at some \$40 billion annually. Hertel and Keeney (2005) feeding estimates from Wilson et al (2004) into their model note that facilitation-induced gains from \$150 billion increase in global merchandise trade is about \$110 billion per annum.

IV. Methodology

a. The Basic Model

The basic estimation framework for this work shall be the gravity model. The gravity model has come to be a popular formulation for statistical analyses of bilateral flows of goods and services between any two countries. Proposed by Tinbergen in 1962, it follows the basic Newton's 'law of universal gravitation' in physics that defines the attraction between any two objects. In line with Newton's intuition, standard representation of the gravity equation in trade relations assumes the amount of trade between countries to be an increasing function of the size of each country represented by its output, and a decreasing function of the obstacles to trade represented by the distance between the two countries. For the latter, the usual measure is the distance between the capital cities of the countries under consideration, viewed as the economic centres.

Since Anderson (1979), a number of studies have tried to give an economically plausible theoretical derivation and justification for the gravity model. As the efforts go, so do the assumptions underpinning the derivation. However, the basic considerations are fairly the same and we briefly outline same underneath following Head (2003).

If the proportion of own income that a country j spends on all goods from all sources be given by M_j and the share of income that it spends on goods from a particular country i be s_{ij} . Clearly, s_{ij} will range between 0 and 1, be positively related to country i 's product variety (n_i) and quality (u_i) as well as be negatively related to the distance between countries i and j (D_{ij}). Relationally, that implies

$$s_{ij} = \frac{g(\eta_i, \mu_i, D_{ij})}{\sum_e g(\mu_e, \eta_e, D_{ej})} \quad (1)$$

Anderson's approach to defining $g(\mu_e, \eta_e, D_{ej})$ is to assume a single good for all countries (i.e. equation n_i to 1) and allowing market preferences u_i to vary. However, Bergstrand (1985) rather uses the Dixit and Stiglitz model of monopolistic competition between differentiated but symmetric firms to assume that the variety coefficient n_i varies with income M_i while equating preferences u_i to 1 (i.e. assuming it is same across countries). Head (2003) showed that for as long as the goods from the same country are of the same average quality and subject to the same transport costs even though they might be differentiated, allowing both quality and variety of goods to vary with elasticity of substitution given by σ will give the $g()$ function (the denominator) as

$$g() = n_i (p_{ij} / \mu_{ij})^{1-\sigma} \quad (2)$$

Again, relating the export price to the price in the origin country given transportation costs will give

$$p_{ij} / \mu_{ij} = (p_i / \mu_i) D_{ij}^{\delta} \quad (3)$$

Where p is the price of goods from country i in country j , D is the distance between the two countries and δ represents exporting country's varieties. Assuming, according to Dixit and Stiglitz that all firms are the same size (q), then $n_i = M_i/q$ and defining $\delta(\sigma - 1) = \theta \geq 0$, then

$$g() = M_i D^{-\theta} / (qk^{\sigma-1}) \quad (4)$$

Implying that market share for exporter i is given by

$$s_{ij} = M_i D_{ij}^{-\theta} R_j \quad (5)$$

R_j , a term that can represent remoteness is given by

$$R_j = 1 / \left[\sum_e M_e D_{ej}^{-\theta} \right] \quad (6)$$

However, it has been severally shown that in a frictionless world, $R_j = 1/M_w$ (with M_w representing world income). For estimation purposes, we simply take the natural logs of income, trade flows and distances to obtain

$$\ln F_{ij} = a \ln M_i + b \ln M_j - c \ln D_{ij} + d \ln R_j + \varepsilon_{ij} \quad (7)$$

While the standard gravity model does well in predicting and/or explaining trade based on just income and distances of two countries, it leaves out a significant amount of unexplained variation in trade (Head, 2003). As a consequence, many works (including Glick and Rose, 2002; Carrere, 2004; Rose, 2001; Frankel and Rose, 2002; Rose and Engel, 2002; Wilson, 2003, 2004; Njinkeu et al, 2008) 'augment' the traditional gravity model. Most of such augmentation are not exactly very theory-based, but are rather rooted in understanding of the underlying properties of the economies being modelled. Traditional variables for augmentation generally include income per capita, adjacency, common language or colonial ties, border effects and membership of regional integration arrangements (Head, 2000 among several others). The rationale behind income per capita as an addition to income is that higher income countries generally trade more than lower income ones. In the same vein, countries that are contiguous might trade more (particularly there might be preponderance of along-the-border trading that are not captured by distance). Again, it has been shown that countries with common historical, colonial and language links tend to trade more with each other than those that do not share these links. A classic example given in the literature on this is India's trade with the United Kingdom and India's trade with Pakistan. While a standard gravity model will predict same volume of trade for India-Pakistan and India-UK (or even more for the former), actual trade is much higher for the latter owing to historical and language ties. In the case of the SADC which is the main focus of this work, border and regional integration effects offset. The border effect simply denotes the friction that occurs in trade on account of geographical demarcation of countries which hinders

unfettered networking among firms. Regional integration effects show the improved impact on trade among countries that may arise on account of membership to the same regional integration arrangement. In particular, with the attention of this work being on trade facilitation, we need such augmentation as described above. Indeed, several works like Limao and Venables (2001); Clark et al (2004) and Njinkeu et al (2008) use augmented gravity models to explain the impact of trade facilitation.

b. Augmented Model – Trade Facilitation Representation

A key challenge of empirical analyses of trade facilitation is that of definition and data. Maur (2008) citing Wilson (2002) noted that there is no universal understanding of what trade facilitation is, reflecting differences, as well as some evolution, in views of what should be the reforms undertaken to reduce the cost of trading. He then proceeded to define trade facilitation as the simplification of the trade interface between partners. Such trade interface is composed in a broad sense of compliance to government rules by traders, enforcement by authorities of these rules (including taxes), exchange of information, financing, insurance, ICT and legal services, transport, handling, measurement and storage. There are also tangible and intangible aspects of such facilitation measures. The vast coverage of issues in trade facilitation also reflects in differences in perceptions and understanding of trade agreements. But even beyond the conceptual, capturing the specific measures of empirical data that should feed into measures of trade facilitation is even more difficult. Maur (2008) underscores trade facilitation reform as the sum of efforts undertaken at the national, regional and multilateral level designed to reduce trade transaction costs. The implication of the above is that there are diversities in the policy instruments and measures that could be adopted as trade facilitation and even more diversities in the empirical proxying of instruments for it. Thus, the need of any empirical work in the area is to clearly justify the use of any instrument relative to their relevance to the specific trade issues of the geographical area under discussion and of the objectives of the specific work being undertaken.

To help muddle through the facilitation maze, Wilson (2003) adopted four broad measures that according to them generally should meet policymakers' needs. These are ports efficiency, customs environment, regulatory environment and services sector infrastructure. While there seems to be some consensus that these are relevant measures, there is significant diversity in approaches to constructing the indicators that should feed into each of the measures. For example, in a subsequent work (Wilson et al, 2004), they use a mix of indicators from three surveys; the first by Kaufmann et al (2002), the second from World Economic Forum Global Competitiveness Report (2001 – 2002) and the third from IMD Lausanne, World Competitiveness Yearbook (2002). Adopting the same measures, Njinkeu et al (2008) use different indicators drawing mainly from World Economic Forum Global Competitiveness Report (2005 – 2006 and 2006 – 2007). The general understanding then is that within the broad range of 'acceptable' measures for trade facilitation, individual works incorporate indicators that are most relevant to the issues and the group being dealt with.

This work will augment the four broad measures proposed by Wilson (2003) in two ways. First, the composition of the indicators will be slightly different. This might lead to adjustment in the nomenclature for identification of the measures so constructed. Secondly, we drop one of the measures (customs environment) and replace it with two measures, number of documents

required for trade and time taken for trade (both drawn from the World Bank Doing Business Scoreboard). In our view, these are broader measures of policies and programmes to facilitate trade among countries. So we shall construct indicators along five measures, three of which are taken from the Global Competitiveness Report (GCR) of the World Economic Forum. The last two will come from the Doing Business Report of the World Bank. The measures are entry and exit infrastructure (which shall incorporate ports efficiency, but include an additional variable – illegal payments for exports and imports), regulatory environment and domestic infrastructure (incorporating physical and social infrastructure at a broader level than that used in any previous work). These three measures are all drawn from the Global Competitiveness Report. The fourth measure is documents for trade (comprising number of documents required for exports and imports) while the fifth is time taken for trade (aggregating time taken for imports and exports), the last two being drawn from the Doing Business Report.

Entry and exit infrastructure will be the average of the three indicators of the rating of quality of facilities in both air and sea ports as well as illegal payments for imports and exports. The rationale is that the three show the state of support physical and logistic infrastructure for entry points for most countries and the quality of infrastructure in these will define the ease of both human and commodity traffic in and out of the country. In addition, the last indicator captures both tariff and non-tariff barriers and complements the time and documents for trade in the Doing Business Report which shall also be used in this work. The *regulatory environment* measure is the average of three indices including wastefulness of government spending, favouritism in decisions of government officials and efficiency of legal framework. Waste in government spending reduces availability of funding for trade-facilitating programmes while favouritism in government decisions impact on efficiency of resource allocation that is necessary for effective productivity and trade. The legal framework on the other hand largely circumscribes the ease of doing business and provides incentives for ‘appropriate behaviour’ by economic agents while protecting the vulnerable. *Domestic infrastructure* measure comprises the average of three indicators – overall infrastructure quality, quality of electricity supply and quality of the educational system. It measures the broad indices of support physical infrastructure available for business and trade in a country and largely impacts on trade quality and volume. Electricity supply and quality is considered especially important for African countries where this is still a major impediment to productivity and trade. The quality of the educational system complements the indicators on physical infrastructure by incorporating a human development angle to growth and trade imperatives.

The two measures from the Doing Business Report are Time for Trade and Documents for Trade. Time for trade will take the average of time for imports and exports while Documents for Trade will take the average of documentation for both imports and exports. The time for imports and exports in the Doing Business report is reported in number of days it takes for import and export respectively. Documents for imports and exports are recorded in terms of the number of documents required to be able to import and export respectively. Both are absolute numbers taken from hard data unlike in the Global competitiveness Report where they are ratings. Incorporating these measures in the model will yield.

$$\begin{aligned}
\ln(1 + F'_{ij}) = & \alpha_1 \ln Y'_i + \alpha_2 \ln Y'_j + \alpha_3 \ln(100 + TAR'_{ij}) + \alpha_4 D_{ij} + \alpha_5 \ln EEI_i \\
& + \alpha_6 RE_i + \alpha_7 INF_i + \alpha_8 TT_i + \alpha_9 DT_i + \alpha_{10} PE_j + \alpha_{11} RE_j + \alpha_{12} INF_j + \alpha_{13} TT_j + \alpha_{14} DT_j \\
& + \alpha_{15} D_{ADJ} + \alpha_{16} D_{SADC} + \alpha_{17} D_{ECOWAS} + \alpha_{18} D_{CEMAC} + \alpha_{19} D_{COMESA} + \alpha_{23} D_{ENG} + \alpha_{24} D_{FR} + \varepsilon_{ij}
\end{aligned} \tag{8}$$

Note that in the place of M, we have chosen to use standard notation for income Y; TAR is tariff for countries i and j; D is distance and D_{ADJ} stands for dummy for adjacency; D_{SADC} , D_{ECOWAS} , D_{CEMAC} , D_{COMESA} , are dummies for the different regional integration groupings represented by countries in the sample; D_{ENG} and D_{FR} represent the two major languages in Africa, English and French with the former being the official language among SADC member countries.

Both theoretically and based on previous empirical works, income impacts on trade positively (Soderstrom 2008; Chaisrisawatsuk and Chaisrisawatsuk, 2007; Zaki, 2008; etc). So the expected sign of the coefficient of Y is positive. Tariff should have a negative impact on trade. The GCR indices are based on ratings that range from 1 to 7; countries performing well on the indices are rated high while those not performing well are rated low. As such, higher scores indicate relative strength in a particular indicator. As such, improvements on indicators of trade facilitation including entry and exit infrastructure (EEI), regulatory environment (RE) and infrastructure (INF) should have a positive impact on trade flows. On the other hand, the Doing Business report for the indices we are using are based on hard data on the number and amount of documents and time taken to transact business. As such, countries with lower numbers of documents and time are considered to perform better than others with higher numbers. As such, reduction in number of documents and time for trading should improve trade flows. So the indicators TT and DT are expected to have negative signs. Adjacency, membership of SADC regional grouping and common language should impact trade positively. But membership of the other regional trade arrangements should impact on South Africa's exports negatively given that it is not a member of these.

c. Country Representation and Data

The data for the study shall include 23 countries from Africa (10 of which are SADC member countries and the rest spread among ECOWAS, COMESA and CEMAC). For a complete list, see Appendix Table 2. Data will mainly be drawn from the Global Competitiveness Report (GCR), which over the last one decade, has metamorphosed into the most comprehensive ranking of competitiveness indices across countries. As at 2007, it covered about 25 African countries with 92 indicators spread over 23 measures and therefore facilitates access to relevant measures of competitiveness facilitation in data-poor and weakly covered Africa in useful dimensions. Equally, the Doing Business Report (DBR) of the World Bank is a very measured assessment of selected indices of support to business activities across countries. Indicators in the DBR are fewer than those in the GCR with the former having 31 indicators spread across 10 measures. However, it covers more countries having about 181 countries as at 2008. Consequently, within the range of indicators that it covers, attention to Africa is considerably broad enough to help trade facilitation research. The two publications shall form the main data sources for trade facilitation indicators in this work.

The rest of the data are collated from a variety of sources including the Easy Data database consisting of more than 250 000 annual, quarterly and monthly time series from as early as 1988 to the present. Over 170 countries and 20 regions (Africa, SADC, EC, NAFTA, etc.) and 15,000 commodities within 145 industries at all HS and ISIC levels are available. Databases accessible through the World Integrated Trade Solution (WITS) – software designed to integrate several trade related databases and provide easy access – include TRAINS (UNCTAD), COMTRADE (UN Statistics Division) and Integrated Database of the WTO (IDB-WTO) and Consolidated Tariff Schedule (CTS-WTO) are used. Data on distances were obtained from University of Essex Project website; calculated using the great distance formula that applies the longitude and latitude of the capital city of each country in the sample. Individual countries' GDP and imports from South Africa were deflated using each country's GDP deflators obtained from USDA (and calculated from a combination of sources including the World Development Indicators, ERS estimates and baseline regional aggregations).

There were some gaps in the data that we had to either fill using a variety of approaches. For example, tariff profiles for Ghana, Gambia and Zimbabwe for 2006 were not available. So the tariff rates for 2006 were obtained by a linear combination of the 2005 2007 values. For a few other countries, the unavailable profiles were for 2005. We again obtained such through a linear trend of the 2006 and 2007 values. No data exists for trade facilitation measures for Ghana in 2007; so we had to use the same approach to obtain its 2007 values based on scores in 2005 and 2006. Data on trade facilitation for Zambia for 2006 and Benin and Cameroon for 2005 were missing and we calculated these using their relative scores in 2005 and 2007 for the first and scores in 2006 and 2007 for the last two. No data exists for all sample countries in the Doing Business entry for 2005. We had to leave this as zero for all countries. This is likely to affect the results, but we think that might be better than to construct data for all countries across two measures for two years which will no doubt introduce serial bias into the results.

In the Appendix Table 1, we try to show the correlation among the trade facilitation variables. Expectedly, the correlation among the variables from each source of trade facilitation is positive and quite high (0.77 for entry and exit infrastructure and regulatory environment; 0.94 for entry and exit infrastructure and domestic infrastructure and 0.75 for regulatory environment and domestic infrastructure in the GCR and 0.83 for documents for trade and time for trade in the DBR). However, across sources, the correlation is weak and mostly negative.

V. Empirical Results

The results from estimating equation 8 with different sets and subsets of the sample are shown in Table 2. The estimation is a two step procedure that first obtains estimates using both the traditional and augmented variables of equation 8 without country fixed effects and afterwards, includes only the trade facilitation variables alongside either GDP or population, with country fixed effects. The essence of the two stage process is to be able to adequately sieve the impact of the trade facilitation variables independent of 'noise' from other variables in the model.

Table 2: Estimation Results

	A		B	
	Without Fixed Effects		With Fixed Effects	
Variable	Coefficient	t-Statistic	Coefficient	t-statistic
C			a/ 12.97	3.21
			b/ 15.45	3.92
			c/ 14.05	3.50
			d/ 13.32	3.20
			e/ 12.52	6.60
GDP			a/ 2.01	2.53
			b/ 1.03	1.58
			c/ 1.97	2.56
			d/ 1.30	1.85
			e/ 1.31	1.99
Population	1.12	2.69		
Tariff			a/ -0.38	-0.30
			b/ -0.65	-0.50
			d/ -0.74	-0.57
			d/ -0.16	-0.12
Exchange Rate	1.15	5.88	a/ 0.07	0.91
			c/ 0.06	0.84
			d/ 0.03	0.37
			e/ 0.03	0.42
Distance	1.37	7.75		
Trade Documents			-0.03	-2.06
Trade Time			-0.01	-1.93
Domestic Infrastructure			0.62	2.02
Entry and Exit Infrastructure	7.12	6.35	0.90	1.73
Regulatory Environment			0.69	1.07
English Language	0.73	0.59		
SADC Membership	-2.15	-1.43		
ECOWAS Membership	0.58	0.41		
CEMAC	-0.06	-0.03		

Notes:

a/ represents estimate from models involving only time for trade

b/ represents estimate from models involving only domestic infrastructure

c/ represents estimate from models involving only number of documents required for trade

d/ represents estimate from models involving only domestic regulatory framework

e/ represents estimate from models involving only entry and exit infrastructure

Besides, the traditional gravity model has just two major explanatory variables – output and distance. Since distance is not incorporated here, it then makes sense to evaluate our facilitation variables with only output – at least as a first step in understanding their impacts. The two results are shown in panels A and B of each table. Appendix Table 2 on the other hand summarizes the individual country fixed effects obtained from panels B of Table 2. All variables with the exception of time for trade and documents for trade are log-linearized.

Consistent with our hypothesis, we could not confirm positive impact of output for most of the modelling without country fixed effects. In fact, in many of the estimates, the coefficient of output was negative signalling that the weak output base of African countries impacted negatively on trade. This seems to indicate that on account of relatively low GDP, trade in this region is driven more by some other variables. For example, the population variable is one of the most potent. For many versions of the estimation, population was consistently more significant (and positively signed) than output. This may imply recognition of the potential impact of population in market exploration even in the face of low income of some African countries. This might be the case in trade with a country like Nigeria where income level is low but high population may reflect potentially large market that can be explored for the future.

The exchange rate variable also has a very significant positive coefficient in the model without country fixed effects implying that depreciation helps improve trade – expectedly so! However, introducing country fixed effects reduces the overall impact of exchange rate. While the coefficient retains a positive sign, it is no longer significant. The impact of tariff in the model without country fixed effects was so insignificant and sometimes wrongly signed that it had to be dropped. However, turning to the model with country fixed effects, the coefficient assumed the right sign. But it still remained largely insignificant relative to other broad macroeconomic variables in the model. In our view, this is partly a reflection of the decreasing role of tariffs in overall trade – an issue that formed the basis of assessment of extra-tariff constraints to trade as in this study. As rightly noted by Baldwin, the WTO has succeeded in drastically reducing tariffs across nations over the last half century.

For most of the modeling, it was not possible to confirm a coefficient for distance aligned to theory – our estimate has a positive sign. The positive sign remained consistent throughout the different sub sample and cross section selections and with different combinations of the explanatory variables. This, in our view, is not exactly as counterintuitive as it may appear at first. In fact, it seems to be consistent with our hypothesis that theoretical postulation of negative impact of distance for trade may not hold in all cases. Primarily, given its geographical position, elite status in Africa and unique history, South Africa's primary trade and economic relations seem to be more with Europe and the rest of the World than with neighbouring countries. The country is one of very few African countries that export manufactures and so trade intensively with faraway countries. While many African countries trade with South Africa; the relative share of such trade is miniscule compared to that from the rest of the world as we earlier showed in Figure 1. In effect, the estimation results reflect the fact that most of South Africa's big trading partners are distant nations. This result calls into question the standard proposition of the gravity model with a possible exception to the rule worth further investigating. Interestingly other studies in the past have also found similar trends (see Pitigala, 2005 for example). More as if to

further buttress the distance indicator, adjacency equally showed up negative indicating that relative to the rest of the world, South Africa trades less with its immediate neighbours. Like the distance indicator, the coefficient of adjacency in the estimation results is quite significant. Of course, as has been severally admitted, there might be quite a sizable proportion of across-the-border trade that might not be captured by official data. Estimates from the available official data though seem to suggest that sharing borders does not necessarily place any of SA's immediate neighbours at an advantage relative to other trading partners. This may be partly on account of technological advancements in both transport and communication that have greatly shrank the importance of proximity or it may be on account of the relative size of output of the neighbouring countries. Again, as in the distance variable, we had to drop adjacency. We could not confirm the significance of some other 'augmented' variables in the model like English language.

An interesting result arises with the coefficient of the SADC membership dummy. Taken alongside other standard determinants of trade, it consistently showed up negative. Even though the coefficient is not very significant, the natural tendency would be to infer that SADC as a group has negative impact on SA's trade with its neighbours. However, given that the sample is shorter than would have allowed an explicit inference of this sort, it may be too early to come to this conclusion. A better approach is to again point it out as an issue worth further investigating. Interestingly, far-away ECOWAS has a positive impact on exports from South Africa, probably because of Nigeria, but it was not significant enough to merit attention. The coefficient of CEMAC membership was negative but largely insignificant.

Among the trade facilitation measures, entry and exit infrastructure seems to be the most significant factor that affects trade. This result is consistent for both estimations with and without country fixed effects. The data for construction of the index include airport and seaport infrastructure and irregular payments for imports and exports. To a large extent, these summarize the logistic challenges that directly face trade (Clark et al, 2004). The results seem to indicate that while such factors as domestic regulatory environment, which deal with regulation at home may be important for overall productivity and possibly for exports, their impact on imports at the global level may be marginal. The same goes for domestic infrastructure which does not seem to have very direct interface with goods from other countries at the time of exchange. The results show both variables are marginal for determining imports from South Africa by other countries. Being quite encompassing and reflexive of trends in the other variables, the results on entry and exit infrastructure is not surprising. About 14 of the 22 countries in the sample (excluding South Africa) have positive influence on South Africa's exports (data for Namibia and Botswana were a bit problematic though and this could have accounted for the outcome for those countries). These positive impacts reflect (ostensibly unexploited) potential for increasing trade.

Thereafter, we bring in the individual trade facilitation variables one at a time to evaluate their impacts given country specific effects. This set of equations was estimated with only the GDP and/or population as principal accompanying variable². The results are shown in panel B of Table 2. While GDP entered most of the variables (as opposed to population used in the model

² Limited degrees of freedom make it difficult to estimate with the whole array of basic and augmented gravity variables alongside the trade facilitation variables when fixed effects of the many countries included in the sample are taken into account.

without fixed effects), it is significant at 5 percent probability levels in 3 out of the five equations – retaining only marginal (10 percent and above) significance in the others. Tariff entered four out of the five equations, but while it was correctly signed, it was not significant in any. The same goes for exchange rate. Among the trade facilitation measures, domestic infrastructure, the number of documents required for import and export and time (in days) taken for export and import have clearly significant effects when country fixed effects are accounted for. The first positively and the last two negatively; all according to specification. The indication then is that within Africa, domestic infrastructure, documentary requirements for trading and time taken for berthing and cargo clearance assume added significance. This result is consistent with findings in Limao and Venables (2001), Kurz et al (2008) among others that show that African countries significantly lag behind in customs reforms that reduce documentation and enhance turn around time for cargo at ports. Ditto for domestic infrastructure; a lot has been said on this and much more can still be said with respect to trade within Africa. Entry and exit infrastructure was again moderately significant (this time at 10 percent) while the significance of the regulatory environment could not be directly confirmed. All variables remain rightly signed though.

VI. Some Implications for Policy and Research

This work set out to evaluate the impact of trade facilitation measures on trade within Africa, using exports from South Africa. The study is undertaken within the context of conclusions by Aldaz-Carroll (2006) that developing countries face an increasing need to upgrade the standards of their domestic markets and of their exports. To do so, the work examined exports from South Africa to 23 countries in Africa, 10 of which are in the SADC. We constructed five measures from a total of 13 indicators from the Global Competitiveness Report of the World Economic Forum and the Doing Business Index of the World Bank. Using an augmented gravity model, we obtained estimates from data covering the period 2005 through 2007.

The estimation results seem to support the kick-off hypotheses that there are exceptions to the provisions of theory on the import of distance, output and tariff on trade among contiguous countries. For exports from South Africa, population seems to be more important than output, indicating attention to market potentials rather than current purchasing power when country fixed effects are not taken into consideration. When it is, output becomes important, and is regularly more important than population. With the dismantling of tariff barriers, exchange rate influences have become critical in determining trends in trade. The coefficient of the distance indicator is particularly atheoretical. While theory provides for a negative impact, estimates indicate positive impact showing that South Africa exports more to distant nations than to ones that are nearer it. In this same direction, the coefficient of adjacency was negative implying that being close endows no greater advantage to any of the countries in the sample relative to others.

A most compelling result, though not as significant as other ‘relevant’ variables, is that of the coefficient of SADC, which showed up to impact negatively on exports. While the outcome of including other regional groupings in the model could be ignored for the time being, the implications of a negative sign for SADC regional grouping for South Africa’s exports are not miniscule. Importantly, the signal being sent is that the high investment into the formation of the regional grouping currently have had net negative impacts on exports from South Africa to the rest of the countries in the region, consistent with indications from Figure 1. Certainly, there are dynamic gains from regional integration (Neary, 2001; Coe et al, 2005, Velde and Meyn 2008,

etc), but these are mostly indirect and even more difficult to measure. When the most direct impact of regional agreements and proximity are not realized, there are really no guarantees for the less direct and more difficult to measure expected benefits.

In contrast, nearly all the measures of trade facilitation constructed for the purpose of this study matter at some point – with entry and exit infrastructure impeding trade the most when country fixed effects are not taken into consideration and time and documents for trade and domestic infrastructure being very important when they are. Simply put, distance could become an advantage (disadvantage) when these trade facilitation measures are (not) in place. Equally, investments in regional trade agreements matter little when these variables are not put in place. In fact, for such regional groupings with the diversity and attendant complexities of forming an RTA as exist in SADC, regional trade agreements can work against trade within the region if not well complemented by other factors.

Within this context, it becomes easy to see what these imply both for national/regional policies pursuing trade agreements and for research on implications of alternative scenario for regional economic groupings. The argument can be made that South Africa is unique being sandwiched within relatively low income countries with weak infrastructure. But so are many relatively large developing economies in Africa to some extent – Kenya within the EAC, Nigeria within ECOWAS and Cameroon within CEMAC. First, the blind pursuit of regional economic agreements simply based on expectations of positive impact borne out of theoretical postulations simply does not help. Worse still, when countries do not regularly evaluate impact using available data on measurable indicators of welfare improvement, trade creation and increased integration among participating countries, the potential negative impacts could escalate. It is usually taken for granted by most countries that proximity qualifies them for regional integration without complementary evaluation of the level of integration on the ground at the point of integrating or even potentials for such integration over time. The result is the frustration that has come to characterize most regional integration efforts in Africa as divergent economic bases and intentions and weak assessment of the costs of such integration ultimately may mean a demise of the efforts and loss of investments with overall negative impact on welfare. However, it makes sense for countries, even while understanding that the minimum conditions for integration are not on the ground, to proceed with integration if they evaluate that the cost of putting the requisite facilities that will improve overall conditions and lead to effective integration could be borne by the countries with the aim of gains over the long run. But this has to be a decision that is made with appropriate evaluation of both potential costs and benefits. Country characteristics differ highly and evaluation of such potential costs and benefits has to take into consideration these characteristics, as is the case in SADC and many African regions.

For research, it clearly does seem that generalizations on impact of regional integration on trade are exaggerated. With technological improvements in transport and communication leading to reduced costs, the part of distance for trade agreements, regional groupings and effectively bilateral trade in standard model formulation may need to be re-evaluated – at least in the case of some countries with defined peculiarities. In particular, it seems that there is need for case by case assessment of the direction of impacts. Definitely, it is not expected that the impact of costs would be positive, but as has come to be widely acknowledged by now, distance does not always equate to higher transport costs.

References

Aldaz-Carroll, Enrique (2006) "Regional Approaches to Better Standards Systems" World Bank Policy Research Working Paper 3948, June 2006, the World Bank Group

Anderson, J.E. (1979) "A Theoretical Foundation for the Gravity Equation." *American Economic Review*, Vol. 69 (1): 106-116.

Arce, Daniel G., and Todd Sandler (2002) "Regional Public Goods: Typologies, Provision, Financing, and Development Assistance" Stockholm: Almqvist and Wiksell International for Exert Group on Development Issues, Swedish Ministry of Foreign Affairs.

Asia Pacific Economic Cooperation (APEC) (1999) "Assessing APEC Trade Liberalization and Facilitation: 1999 Update" Economic Committee, September 1999. APEC: Singapore.

Baller, Silja (2007) "Trade Effects of Regional Standards Liberalization: A Heterogeneous Firms Approach" World Bank Policy Research Working Paper No 4124, February 2007

Carrere, C. (2004), "African Regional Agreements: Impact on Trade with or without Currency Union." *Journal of African Economies*, 13(2): 199-239.

Chaisrisawatsuk, S. and W. Chaisrisawatsuk (2007) "Imports, exports and foreign direct investment interactions and their effects", pp.97-115, Chapter IV in ESCAP, *Towards coherent policy frameworks: understanding trade and investment linkages – A study by the Asia-Pacific Research and Training Network on Trade*, (United Nations, New York).

Clark, Ximena, Dollar, David and Micco, Alejandro (2004) "Port Efficiency, Marine Transport Costs and Bilateral Trade" National Bureau of Economic Research (NBER), Working Papers, No. 10353

Cernat, L. (2001) "Assessing Regional trade Arrangements: Are South-South RTAs More Trade Diverting?" *Global Economy Quarterly*, 2 (3): 235-59.

Coe, D. T., E. Helpman and A.W. Hoffmeister (1997) "North-South R&D Spillovers", *Economic Journal* 107, 134-49

Dennis, Allen (2006) "The Impact of Regional Trade Agreements and Trade Facilitation in the Middle East North Africa Region" World Bank Policy Research Working Paper 3837, February 2006

Frankel, J.A and A.K. Rose (2002) "An Estimate of the Effect of Common Currencies on Trade and Income" *Quarterly Journal of Economic*, 117(2): 437-66.

Fox, A., J. François, and P. Londono-Kent (2003) "Measuring Border Crossing Costs and their Impact on Trade Flows: The United-States-Mexico Trucking Car." GTAP Resources No. 1282, Purdue University

Glick, R. and A.K. Rose (2002) "Does A Currency Union Affect Trade? The Time Series Evidence" *European Economic Review*, 46: 1125-1151

Head, Keith (2003) "Gravity for Beginners" Work-in-Progress paper prepared for University of British Columbia Students, UBC 2053 Main Mall, Vancouver, BC. V6T1Z2 Canada, January 2003

Hertel, W.T., Walmsley, T. and K. Itakura (2001) "Dynamic Effects of the 'New Age' Free Trade Agreement between Japan and Singapore," *Journal of Economic Integration*, 16, pp.446-484

Hertel, T. and R. Keeney (2005) "What's at stake: the relative importance of import barriers, export subsidies and domestic support", in Anderson, K. and T. Hertel (eds), *Agricultural Trade Reform and the Doha Development Agenda*

Hummels, D. (2001) "Time as a Trade Barrier" Department of Economics, Indiana: Purdue University, Mimeo

Kurz, Sonja, Thomas Otter and Felix Povel (2008) "SADC Trade Integration – The Effect of Trade Facilitation on Sectoral Trade: A Quantitative Analysis" Chapter 3 of the Book *Project Monitoring Regional Integration in Southern Africa Yearbook 2008*; Written with support of the GTZ/GFA Programme to strengthen the SADC Secretariat.

Limao, N. and A.J. Venables (2001) "Infrastructure, Geographical Disadvantage, Transport Costs, and Trade" *World Bank Economic Review*, 15, 3: 451-479

Maur, Jean-Christophe (2008) "Regionalism and Trade Facilitation: A Primer" Policy Research Working Paper 4464, the World Bank Development Research Group Trade Team January 2008

Melitz, Marc (2003) "The impact of trade on intra-industry reallocations and aggregate industry productivity", *Econometrica*

Neary, J.P. (2001) "Foreign Direct Investment and the Single Market" Draft paper CEPR and University College Dublin

Njinkeu, Dominique, John S. Wilson and Bruno Powo Fosso (2008) "Expanding Trade within Africa: The Impact of Trade Facilitation" Policy Research Working Paper 4790

Organization for Economic Cooperation and Development (OECD) (2003) "Quantitative Assessment of Benefits of Trade Facilitation" OECD Document TD/TC/WP(2003)31/Final

Pitigala, Nihal (2005) "What Does Regional Trade in South Asia Reveal about Future Trade Integration? Some Empirical Evidence" World Bank Policy Research Working Paper 3497, February 2005

Rose, Andrew K. (2001) "Currency Unions and Trade: The Effect is Large." *Economic Policy*, Vol. 16 No 33: 433-62

Rose, Andrew K. and C. Engel (2002) "Currency Unions and International Integration", *Journal of Money, Credit, and Banking*, 34(4): 1067-1089.

Sauve, Pierre and Americo B. Zampetti (2000) "Subsidiarity Perspectives on the New Trade Agenda", *Journal of International Economic Law*, 3, 1: 83-114

Soderstrom, Jannice (2008) "Cultural Distance – An Assessment of Cultural Effects on Trade Flows" Master Thesis in Economics, Jonkoping International Business School, Jonkoping University, May 2008

Velde, Dirk Willem and Mareike Meyn (2008) "Regional Integration In African, Caribbean and Pacific countries: A review of the literature" Report Prepared for the Overseas Development Institute (ODI) with Support from the European Commission, DG Development, September, 2008

Wilson, John S. (2002) "Standards, regulation, and trade: WTO rules and developing country concerns" in Hoekman, Mattoo and English (Eds) Development, Trade and the WTO: A Handbook

Wilson, John S. (2003) "Trade Facilitation and Economic Development: Measuring the Impact." World Bank Working Paper 2988, Washington, D.C.

Wilson, J.S., C.L. Mann and T. Otsuki (2004) "Assessing the Potential Benefit of Trade Facilitation: A Global Perspective" World Bank Working Paper 3224, Washington, D.C.

World Bank (2005) "Trade, Regionalism, and Development, Global Economic Prospects", 34437, 2005

Yeats, A. (1998) "What Can Be Expected from African Regional Trade Arrangements? Some Empirical Evidence," Policy Research Working Paper, No. 2004, World Bank

Zaki, Chahir (2008) "Does Trade Facilitation Matter in Bilateral Trade?" Centre d'Economie de la Sorbonne, UMR8174, POLE Team, Universite Paris I Pantheon Sorbonne, Paris School of Economics, November, 2008

Zarrouk, J. (2003) "A Survey of Barriers to Trade and Investment in Arab Countries", in Gala, A. and B. Hoekman (eds), *Arab Economic Integration.*, Brookings Institution Press, Washington DC.

Appendix

Table 1: Correlation among the Trade Facilitation Measures

Pair	Correlation Coefficient
Entry and Exit Infrastructure and Regulatory Environment	0.77
Entry and Exit Infrastructure and Domestic Infrastructure	0.94
Entry and Exit Infrastructure and Documents for Trade	-0.31
Entry and Exit Infrastructure and Time for Trade	-0.53
Regulatory Environment and Domestic Infrastructure	0.75
Regulatory Environment and Documents for Trade	-0.21
Regulatory Environment and Time for Trade	-0.39
Domestic Infrastructure and Documents for Trade	-0.29
Domestic Infrastructure and Time for Trade	-0.49
Documents for Trade and Time for Trade	0.83

Source: Estimation Results

Table 2: Country Fixed Effects

Country	Fixed Effects
Algeria	0.634564
Benin	1.174596
Botswana	-9.929186
Cameroon	-0.250837
Chad	-0.269564
Egypt	-3.642842
Ethiopia	-0.146549
Gambia	5.053459
Ghana	2.582234
Kenya	1.679918
Madagascar	2.618330
Malawi	5.775506
Mali	2.139022
Mauritius	3.044918
Morocco	-1.229765
Mozambique	4.794500
Namibia	-9.402611
Nigeria	-1.542846
South Africa	-15.33811
Tanzania	2.361939
Tunisia	-2.438114
Uganda	1.295909
Zambia	4.008750
Zimbabwe	7.661344

Source: Estimation Results