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Killing Two Ostriches with One Stone: Will Barriers to SADC Trade be Reduced as a By-product of Exchange Control Liberalisation within the Region?*

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Abstract

This thesis investigates the effect of exchange controls on trade of the Southern African Development Community (SADC). Restrictions on foreign exchange should be adjusted (liberalised to an extent) in order to harmonise policies between members, as an important part of the regional integration plan, which aims at the creation of a Monetary Union by 2018. The first step taken to examine the collateral effect of this on trade involves the construction of a new index, measuring exchange control restrictiveness (ECRI) across SADC countries over the last 10 years, based on the IMF's Annual Report on Exchange Arrangements (AREAR). The index is disaggregated into 5 sub-categories to inform the subject further. A brief analysis of these indices precedes their insertion into an augmented gravity model of trade for 10 years, constituting the second part of the paper. Estimating the panel gravity model using Ordinary Least Squares (OLS) and Poisson pseudo-maximum likelihood (PPML) techniques, reveals that exchange controls effectively act as non-tariff trade barriers and, as such, the easing of overall exchange controls will not only facilitate policy coordination among member states, but should also liberalise SADC trade. This effect is especially pronounced when considering controls related to current account transactions.

1 Introduction

The desire to form an African Common Market and Economic Community (AEC) was introduced in the 1980 Lagos Plan of Action, reiterated in the 1991 African Economic Treaty, and again in the 2000 Constitutive Act of the African Union. The plan is proposed to come to fruition by 2023, and seeks to reverse the continent's historically poor growth performance given its vast natural resources and strategic geographic positioning (Collier and Gunning, 1999). The marginalisation of African trade within a global context has been viewed as a key explanation for the stagnant growth performance of the past, and underlies the motivation for the African regional integration since 1910. The promotion of intra-African trade is essential in achieving the goal of a continent-wide common market that requires each bloc to first and foremost establish itself as a Free Trade Area (FTA).

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The benefits of FTAs are especially appealing among groups of African countries, which are characteristically small, dispersed and diversified (Meyer *et al*, 2010). Broader groups of countries generate more domestic competition in larger markets, where economies of scale can be exploited. They enjoy a more attractive investment environment, benefit from diminished transportation costs, as well as coastal access for landlocked countries and increased bargaining power, to name but a few advantages (Yang and Gupta, 2008).

Currently, the continent is home to some 30 official Regional Trade Agreements (RTAs), with each country party to an average 4 trade protocols (Yang and Gupta, 2008). This web of RTAs is consolidated under the 8 Regional Economic Communities (RECs) of the AEC, one of which is the Southern African Development Community (SADC). Despite the disparities between the RECs in terms of their individual progress to FTA status, the participating countries soldier on towards the goal of continent-wide integration. One such recent goal was set in 2012, when the African Union Heads of State agreed to establish a continental FTA by 2017, open to review subject to progress made. Regardless of the feasibility (or lack thereof) of this plan, the process of regional integration within each REC remains beneficial to participating countries, and impediments to, and consequences of, this process provide extensive opportunities for research.

To this end, this analysis focuses on SADC regional integration and, in particular, how the process of liberalising exchange controls to create a common market affects the trade of member states. The SADC regional bloc comprises 15 countries: Angola, Botswana, the Democratic Republic of Congo (DRC), Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, the Seychelles, South Africa, Swaziland, United Republic of Tanzania, Zambia and Zimbabwe. The bloc represents a market of 273 million people with a GDP of \$575 billion.¹ The SADC regional integration program was set out in 1993 and includes the establishment of a FTA by 2008, a Customs Union by 2010, a Common Market by 2015 and, finally, a monetary union and a single currency by 2018. Thus far, the FTA was launched on time, with all member states (except the Seychelles, Angola and the DRC) removing intra-SADC tariffs on 85% of their products. The SADC boasts a relatively high share of intra-SADC trade at 11% of the region's total trade (UNCTAD, 2011) and despite fears in some quarters, the FTA is showing promising signs of integration with the rest of the world and within the region (Edwards and Behar, 2011).

The challenge of regional integration begins with the removal of tariff and non-tariff barriers to trade among REC members. These trade distortions serve as impediments to SADC trade with all of its trading partners, not just intra-regionally. This paper assesses the unique theories of Wei and Zhang (2007) and Tamarisa (1999), who propose that, in the global setting, various controls on foreign exchange act as non-tariff barriers to trade, with a detrimental effect on bilateral flows comparable to that of import tariffs. Recent research assessing SADC trade performance highlights the problems of under-development of African infrastructure (Portugal-Perez and Wilson, 2008), the institutional quality of a neighbouring country (Behar and Manners, 2010), South African domination of local industry (Chauvin and Gaullier, 2003; Jefferis, 2007) and the complexities and burden of preferential tariff barriers within SADC countries (Chauvin and Gaullier, 2003; Edwards and Behar, 2011). This list is not exhaustive, but highlights the range of obstacles to trade in the SADC. In this context, exchange controls are just one of the numerous barriers to trade, but must be harmonised to get to a monetary union and a common currency.

Unlike tariffs, there is little quantitative data on exchange controls by country, and the main source of data is an annual list of restrictions published by the IMF in their Annual Report on Exchange Arrangements and Exchange Restrictions (AREAR).

¹ See <http://sadc.int>.

There is a considerable amount of literature assessing the value and desirability of the liberalisation of exchange controls towards global financial liberalisation (Bicini, Hutchinson and Schindler, 2010), but quantitative data has been limited. In order to provide a tool to both compare countries' relative restrictiveness and to empirically test the effects of this restrictiveness, a number of papers, including Wei and Zhang (2007) and Tamarisa (1999), introduce an index based on data from the AREAR for a number of global countries. Owing to the shortcomings and inaccessibility of those indices, a new index of exchange control restrictiveness (ECRI) is created here for the SADC countries from 2000 to 2010. It includes scores for sub-categories that reflect the major factors affecting foreign exchange payments relating to current and capital external account transactions.

This paper follows the work of Wei and Zhang (2007) and Tamarisa (1999) by building a standard gravity model of trade and testing the newly-constructed ECRI. The methods applied in this paper focus solely on the SADC. The author updates past research by applying the extended gravity model of trade that controls for multilateral resistance (Anderson and Van Wincoop, 2003) to the Poisson pseudo-maximum likelihood (PPML) estimation technique popularised by Silva and Tenreyro (2006; 2009) for comparative purposes. This model has become ubiquitous in recent trade research, given its elimination of key biases inherent in traditional methods of gravity model estimation. By incorporating the insights of Silva and Tenreyro (2006; 2009), this investigation utilises a more robust and up-to-date methodology to examine the relationship between exchange controls and trade in order to test whether these restrictions should be added to the list of barriers to SADC trade, as is suggested by the two previous studies.

This study finds that elements of the index, though quantitatively small, are significant and negative in the gravity model, which implies that SADC exchange controls have, *ceteris paribus*, represented an impediment to average SADC trade over the last 10 years. Overall restrictiveness of exchange controls can be regarded as an additional obstacle to the current research on SADC trade barriers, especially the goods and services component of the index. Overall, there is evidence to suggest that the liberalisation of these restrictions will have a small but nevertheless promotional effect on trade going forward. This investigation contributes to the limited literature on the subject in two apparent ways. Firstly, the creation of the ECRI for SADC countries provides a useful tool for further research in assessing the extent of exchange and capital account restrictiveness in the SADC. Secondly, the application of the PPML gravity model is consistent with recent empirical practices and thereby updates the methodology presented in the mentioned literature on the subject of exchange controls acting as a barrier to trade.

The paper is presented as follows: Section 2 and 3 place the investigation into context, providing background on trade in the SADC and the relationship between trade and exchange controls respectively. Section 2 begins by outlining the progress towards a SADC monetary union through an overview of the regional institutional developments, recent trade history and prevalent trade barriers. Section 3 focuses on exchange controls and their progress to liberalisation in the SADC, followed by a review of theoretical and empirical literature on exchange controls and their effect on trade. Section 4 explains the construction of the ECRI, assesses its value in the context of existing indices, and thereafter provides a brief analysis of the movements of the index over time. Section 5 presents the empirical model and an analysis of the restrictiveness index on SADC trade in various settings, while noting the caveats associated with the empirical model introduced. Section 6 briefly reviews the results, suggests corresponding policy implications, and recommends avenues for future research.

2 Trade in the SADC Context

This section focuses on the dynamics of trade in the SADC regional group, firstly in the context of the regional integration agenda, secondly by overiewing recent trade flows of the SADC bloc and, thirdly, by a review of prominent impediments to trade. The establishment of a regional FTA and the promotion of trade among members is coupled with the pursuit of overall trade as part of the general African growth agenda. To this end, in assessing the trade trends of member countries over the last 10 years, this subsection assesses recent trade movements, signs of trade integration with the world and within the region, and prevalent obstacles to trade in the form of tariffs and non-tariff barriers (NTBs).

2.1 Regional Integration Agenda

Table 1 is an overview of the 15-year Regional Indicative Strategic Development Plan (RISDP), developed in 2003, that outlines the SADC regional integration agenda. The detailed plan contains numerous objectives and strategies for member countries to follow to achieve the MU by 2018. Over the first 5 years of its inception, the SADC has displayed favourable progress in attaining these goals. Out of 46 targets, 14% have been fully achieved, 68% partially achieved, and 18% not achieved. Indeed, the first milestone was the establishment of the SADC FTA in 2008 according to plan.

Table 1: Proposed Stages of a SADC Monetary Union

1	Free Trade Area	FTA	Removal of tariffs on intra-SADC trade	2008
2	Customs Union	CU	Uniform tariffs on imports from non-member states	2010
3	Common Market	CM	Free movement of factors of production between members	2012
4	Incomplete Monetary Union	IMU	Fixed exchange rates and monetary policy coordination	2016
5	Full Monetary Union	MU	Single currency under one regional central bank	2018

Source: RISDP (SADC, 2003a), and Tavlas (2008).

There is some debate, though, as to whether the due dates assigned to the subsequent steps are practical. For example, the adverse effects of the global crisis from 2009 slowed down progress towards total trade liberalisation and made the achievement of a customs union by 2010 unfeasible (Mashayekhi and Peters, 2012), in turn delaying the movement towards a common market, and so on. It should be noted that in the face of distinct divergences between member countries over macroeconomic indicators, fiscal policies, political agendas, wealth levels and institutional strength, it is generally considered highly impractical to encompass all countries under a full monetary integration arrangement by 2018 (Jefferis, 2007).² Neverthe-

² GDP per capita of member countries ranges from \$201 in DRC and \$408 in Mozambique to \$7255 in South Africa, \$7403 in Botswana and \$7488 in Mauritius. The general consensus is that the process should follow a more gradual path where countries that demonstrate desirable convergence in the areas of inflation, interest rates and exchange rate volatility (Madagascar, Mauritius, Mozambique, Seychelles, Tanzania and SACU members) create a "precursor Union". The remaining countries (Angola, Malawi, Zambia and Zimbabwe) will be excluded until the convergence criteria are acceptably met. See Jefferis (2007) and Mashayekhi and Peters (2012).

less, the regional integration process is in motion and the formation of a SADC FTA is itself a commendable achievement given the obviously desirable consequences for trade generation and the significance of its establishment as a step to creating the African Free Trade Area by 2017.

As of 2012, the region has finalised plans to launch the Tripartite FTA with the Common Market for Eastern and Southern Africa (COMESA) and the East African Community (EAC) by 2014. The combination of these 3 RECs contains just under 600 million people with a combined GDP of around \$1 trillion, covers more than half of Africa's population and accounts for more than half of its GDP.³ The tripartite arrangement is expected to remove intra-regional trade distortions between the three regional groups and to contribute significantly to the goal of the continental regional trade area. The SADC has emerged as Africa's flagship regional trade area, anchored by the robust South African economy and enjoying the stability of its member countries. By 2010, Most-Favoured Nation (MFN) rates have been reduced on 85% of member country products and are generally close to zero. Section 2.3 discusses this in further detail. The SADC's internal trade performance has exceeded that of other RECs, with 11% of total SADC trade attributable to intra-SADC trade, whereas it is just 6% in COMESA. This is, of course, a crude indication of regionalism, and cannot necessarily be attributed to the creation of the RTA.

2.2 Recent SADC Trade Trends

In terms of the SADC's overall trade performance, Edwards and Behar (2011) conclude that the bloc's trade is relatively well-integrated with the world by virtue of the fact that the growth in bilateral trade flows between 1990 and 2008 is reassuringly consistent with global trade movements. They argue that the decline in the region's world share of trade is indicative of poor economic growth rather than structural impediments to trade (Edwards and Behar, 2011).⁴ The SADC's progress towards trade openness is evident in the overall composition of exported products, which is notably diverse, as is their range of export partners (Edwards and Behar, 2011). As shown in Table 2, exports of SADC countries are concentrated on destinations in the European Union (EU) and other high income OECD markets (Mashayekhi and Peters, 2012). Between 2005 and 2010 this relationship is on a downward trend, while exports to Brazil, Russia, India and China (BRIC) have increased by more than double; to 30% of total SADC exports.⁵ SADC imports follow similar trends (Mashayekhi and Peters, 2012).

The optimistic outlook of overall trade patterns is echoed when looking only at trade between SADC members themselves. The recent trade history of the SADC presents a promising picture of intra-regional trade integration in a number of relevant areas (Edwards and Behar, 2011). Firstly, Table 2 displays the fact that SADC intra-regional to total trade ratio is 11%, which, when compared to other African RECs, is high (Mashayekhi and Peters, 2012). When controlling for income disparities (GDP), SADC countries are trading more with each other than the rest of the world as evidenced by the highly significant, positive intra-regional trade dummy in a panel gravity equation (Behar and Manners, 2011). Furthermore, intra-regional exports are found to be more diversified,

³ See <http://sadc.int>.

⁴ They substantiate their claim by examining SADC merchandise exports as a share of GDP compared to other regional groups and by using a gravity model of trade, in which GDP and geography are accounted for (Edwards and Behar, 2011).

⁵ It should be noted that export markets vary considerably between SADC members. For example, while more than 60% of Botswana's exports go to the EU, the comparable EU export shares are much lower for Swaziland, Tanzania and Zambia.

Table 2: Destination composition of SADC exports (percentages)

	2000	2005	2010
SADC	12.6	9.7	10.9
Rest of Africa	2.4	3.1	3.2
EU	37.9	34.0	23.0
Other high income OECD	27.9	29.2	26.4
BRICs	7.8	13.0	28.8
Rest of the World	11.3	11.0	7.7

Source: UNCTAD extracted by Mashayekhi and Peters (2012).

compared to exports to the rest of the world.⁶ Moreover, from 1999, high intra-regional trade dependence is evident, most notably Malawi, Mozambique, Zambia and Zimbabwe each rely on SADC for more than 50% of their total imports and 20% of total exports, with Zimbabwe leading at 90% (Chauvin and Gaullier, 2003). In 2008, the SACU, whose trade flows consist mostly of South African trade, was responsible for purchasing an astounding 65% of total intra-regional exports, and about 80% of total intra-SADC imports came from the customs union (Edwards and Behar, 2011).

Though these signs are indicative of encouraging trade integration both internally and externally, the intra-regional trade growth rate is not particularly attractive. As a proportion of total SADC imports, imports from other SADC countries has slowed since 1999, increasing from 10.2% to a mere 12.5% in 2008, whereas the previous decade saw this proportion double from 5.1% in 1990 to 10.2% in 1999 (Edwards and Behar, 2011). Regarding trade growth within the region, Table 2 shows that between 2000 and 2005 intra-SADC trade proportion of total SADC exports, relative to total exports, has declined to 9.6% from 12.6% and has only recovered by 1 percentage point over the subsequent 5 years. This is mostly due to China's recent dominance of trade to and from the region, which has overshadowed the relative growth of intra-SADC trade. However, this along with the fact that recent gravity models of trade also suggest the insignificance of being a member of SADC as a factor in boosting SADC trade in a substantial way (Chauvin and Gaullier, 2003; Edwards and Behar, 2011; Mashayekhi and Peters, 2012) suggests that, despite established FTA status, the persistence of barriers to regional trade is hindering the efficient implementation of the trade agreement. As such, their identification and alleviation of barriers to intra- and extra- SADC trade forms an important area of research.⁷

2.3 Obstacles to SADC Trade

Edwards and Behar (2011) identify 2 avenues through which tariffs have been reformed in recent years: regionally and uni- or multilaterally. In terms of unilateral and multilateral tariff reforms, tariff levels are far lower than in the past. As mentioned in Section 2.1, from 2000, leading up to the FTA establishment, MFN rates have been reduced to almost zero. Tariffs have been removed on 85% of SADC member products, with sensitive products consisting

⁶ This is somewhat corroborated by a PRODY index that measures that the sophistication of SADC exported goods is higher for SADC's intra-regional trade compared to external trade (Mashayekhi and Peters, 2012). A higher index is related to higher growth rates (Hausmann Hwang and Rodrick, 2007).

⁷ Lowering barriers to trade improve both the volume of aggregate exports and the extent of products exported (Edwards and Behar, 2011).

of the remaining 15%.⁸ These were scheduled to be liberalised by 2012, although it is not clear whether this timetable will be met. Among the member states, the liberalisation of tariffs has taken place at considerably different rates, as investigated by Mashayekhi and Peters (2012). For example, a sizeable discrepancy exists between MFN rates between South Africa and Mozambique, where South Africa removed most tariffs between 2000 and 2005, whereas Mozambique, like other least developed countries (LDCs), such as Zambia, generally only introduced tariff reductions during 2008 and 2009. Angola and the DRC are expected to join the FTA soon and follow suit. Other countries, such as Mauritius, have taken a more gradual approach in reducing their tariffs each year between 2000 and 2008. In general, the more developed countries have reduced tariffs at a faster rate. Each country has its own history of tariff rates, which makes it important to focus on more specific analyses of these effects.

While regional tariff rates are declining, under Preferential Trade Agreements (PTAs) member states maintain stringent Rules of Origin (ROO) requirements that have not been effectively consolidated and therefore inhibit trade. Preferential tariffs among SADC member states are both restrictive and complex.⁹ Preferential tariffs in the SADC case, particularly their ROO requirements, tend to overlap and undermine the efficiency of regional memberships. Essentially, trading partners apply different external tariffs because of their membership of different trade agreements. The complexities involved with various overlapping tariffs imposed by different regional memberships reduces the efficiency of the memberships (Edwards and Behar, 2011). The SADC is involved in PTAs with non-African countries, such as the EU, through the Everything But Arms (EBA), under which all imports to the EU from the LDCs are duty and quota free, with the exception of armaments and the US Africa Growth and Opportunity Act (AGOA) between South Africa and the United States, who are granted preferential market access to imports of relatively labour-intensive textile products from the SADC region.¹⁰ The single FTA of the Tripartite arrangement hopes to reduce the overlapping membership problems in the SSA and establish harmony in regional integration.

ROO provisions have been identified as a substantial barrier to SADC trade facilitation. In addition to their profound implications on the competitiveness of domestic producers, consumer welfare and investment, the ROO state that only goods originating from participating countries are subject to tariff preferences. They aim to prevent third country imports from entering a PTA through a lower tariff member of the trade pact so as to avoid the payment of duties. They have been found to be more harmful than helpful to African trade flows, restricting countries access to these preferential markets and limiting opportunities to diversify exports (de Melo and Portugal-Perez, 2009). In SADC, restrictive ROO have been found to limit the potential benefits of preferential market access by denying regional producers access to internationally competitive inputs and raw materials which are likely their best hope for becoming globally competitive. These restrictions have been singled out as the prime suspects for the low levels preferential access utilisation to the EU by LDCs (Brenton and Manchin, 2002).

⁸ Sensitive and excluded products include motor vehicles and vehicle components, and various specified clothing items (UNCTAD, 2008).

⁹ A PTA is a trade protocol that gives preferential access to certain products from the participating countries. To this end, countries become members of a trade pact under which tariffs are reduced but not abolished totally under a trade pact. The tariff preference schedules stipulated by these agreements contradict the normal trade relations principle of the World Trade Organization (WTO) that requires members to apply the same tariff to imports from other WTO members. The line between a PTA and a FTA is often blurred, as almost any PTA has the main goal of becoming a FTA in accordance with the General Agreement on Tariffs and Trade, forming the first step towards economic integration (Cheong *et al*, 2012).

¹⁰ The EBA is part of the EU Generalized System of Preferences (GSP), and aims to encourage the development of the world's poorest countries in particular.

Although the EBA program provides for duty free imports for these countries' ROO, especially those pertaining to apparel severely inhibit imports, mostly owing to the fact that members often out-source certain phases of production (Cheong and Takayama, 2012). The SADC has already benefitted from the relaxation of the ROO requirements in sourcing inputs for clothing exports to the US via AGOA, which generated a substantial increase in clothing exports to the region (de Melo and Portugal-Perez, 2009). Further efforts to alleviate these constraints will likely promote trade creation. It is necessary that the SADC reforms these regulations to coordinate the tariff schedules faced by SADC members and the restrictiveness of them. Moreover, the costs associated with ensuring that members of the PTAs conform to the ROO are burdensome for participating countries (Edwards and Behar, 2011).

Apart from tariff-related barriers to trade, "serious concern" has been expressed at the impact of non-tariff barriers (NTB) on intra-regional trade.¹¹ Indeed there exists an array of overall trade obstacles under the SADC NTB umbrella.

Edwards and Behar (2011) test the prevalence of SADC NTBs empirically by assessing the significance of being a SADC member on 14 indices, including institutional quality, logistics performance and administrative efficiency, while controlling for income and other baseline variables. Angola, Mauritius and Zambia appear to be constrained by *logistics costs*, and *costs of importing and exporting* are prevalent in Angola, Malawi, CLM and Zambia, while the remaining member countries do not demonstrate unusual prevalence of NTBs. The SADC, as a whole, is not found to perform particularly badly in comparison to the rest of the world, often boasting fewer obstacles to trade, with the regional dummy variable rarely significant otherwise. *Timeliness* and *transport and communications infrastructure* are, to some degree, seen as exceptions to this.¹² Ephraim (2007), on the other hand, argues that compared to other regions, NTBs are markedly prevalent and restrictive with high costs of doing business and excessive procedural constraints to engaging in trade in the region, as reported by the World Bank (WB) and Global Competitiveness Reports.

Infrastructure, in general, is seen as a primary hindrance to intra-regional and intra-African trade as a whole (Longo and Sekkat, 2004), with notable under-development of transport systems (Portugal-Perez and Wilson, 2008). Furthermore, impediments to SADC trade include neighbouring countries' logistical ineptitude (Behar *et al*, 2009) and the distortion created by South Africa's trade dominance in the region (Chauvin and Gaullier, 2003). A recent report by the World Bank (2012) highlights trade permits, export taxes, import licenses and bans as hampering trade within the SADC. Many countries continue to introduce new NTBs, such as restrictions on certain goods, import bans or surcharges, and additional levies in an often arbitrary and non-transparent manner, specifically in trade in agricultural goods. Those associated with agricultural goods are often cited as necessary for health and safety reasons, but relate in many cases to the protection of domestic producers, which result in distortions to trade. For example, Erasmus, Flatters and Kirk (2006) illuminate the restrictive NTBs on wheat flour trade in the SADC, such as in Mauritius, where all wheat flour imports are controlled through its State Trading Corporation, and in South Africa, where trade in wheat flour is limited under the mandate that all domestically sold wheat flour must be 'vitamin-enriched'. Indeed, the scope of NTBs in the SADC region seems to be extensive.

As part of the research for their study on SADC exchange control liberalisation, Ellyne and

¹¹ NTBs formed the focus of the SADC Ministerial meeting conducted in Windhoek on 4 March 2011.

¹² These results must be interpreted with caution, given the presence of endogeneity. Nevertheless they provide an interesting preliminary overview between potential barriers to SADC trade and, more importantly, highlight a need for country-specific approaches to the analysis of SADC trade barriers, as the general view can yield a distorted impression (Edwards and Behar, 2011).

Letete (2012) conducted extensive meetings with representatives of the SADC private sector, which revealed that price and tax distortions are viewed as persistent impediments to trade. In addition, business sector members in SADC expressed serious concern over the significance of governance-type factors in limiting trade, including corruption, government effectiveness, regulatory quality, and political instability (Ellyne and Letete, 2012). These factors act as a tax on cross-border trade and vary widely among the SADC countries, although empirical analysis on these effects has not yet been conducted.

Exchange controls are theoretically considered NTBs but are often excluded from this classification and NTB-related research. It is likely that the relative importance of exchange controls as a trade constraint has diminished in comparison to more fundamental constraints such as transportation costs, ROO, governance issues, and other selective protectionist restrictions. Nonetheless, there is no reason to doubt that exchange controls are trade-reducing, even if their effect cannot be readily isolated from other trade constraints.

3 Exchange Controls as Barriers to SADC Trade

Sections 2.2 and 2.3 discussed tariff and non-tariff barriers (NTBs) to SADC trade that have been covered extensively in the literature. Exchange controls can be included as a NTB to trade but the research on this subject is limited. The existing theoretical and empirical studies on the relationship between exchange controls and trade flows are explored below. Firstly, though, this section briefly outlines the process of liberalising existent exchange controls as an important part of the SADC monetary union agenda. Hitherto, no empirical information specific to how the adjustment of these controls in the SADC will influence the trade flows of member countries exists, a deficit which this paper aims to rectify.

3.1 Exchange Control Liberalisation in the SADC

The path to a full monetary union (MU) requires either the liberalisation of factors of production by 2012. There must be free movement of capital within the region, although there may be restrictions on capital leaving the region, much like a customs union. The free movement of capital requires capital account liberalisation among the SADC countries or the total removal of exchange controls. The liberalisation is to be coordinated across the SADC region and harmonised to the extent that respective currencies are at a fixed convertible rate.

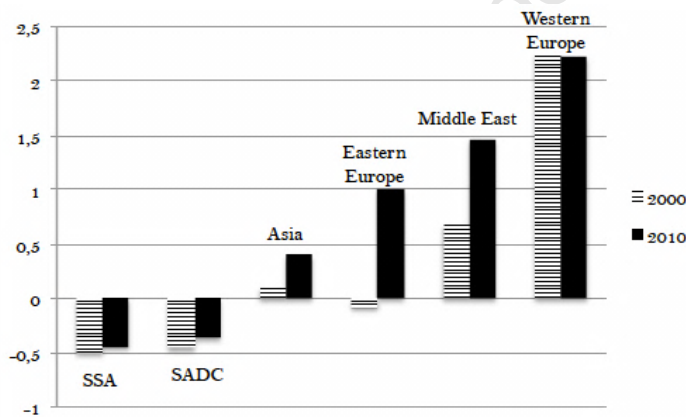
As a corollary, the presence of exchange controls is observed to exert an indirect impact on the effectiveness of monetary policy. In some cases, restrictive exchange controls help sustain parallel exchange markets which, along with the dollarisation of the economy, reduces the effectiveness of monetary policy. For example, as parallel markets grow and dollarisation of the economy rises, so the effectiveness of monetary policy is reduced, with full dollarisation representing a complete loss of monetary control (as in Zimbabwe). Furthermore, maintaining a closed capital account is not a feasible way of controlling both monetary policy and the exchange rate, as the various leakages in the BOP would undermine the coordination of these goals. Overall, each member state will need to make sure that their policies are harmonised with those of other member states, going forward to an MU.

Global trends are for the removal of exchange controls, and support financial liberalisation (liberalisation of the capital account) (Bincini *et al*, 2010), though SADC member states are thus far not as liberalised as expected (Ellyne and Letete, 2012). In order to assess the current restrictiveness of member countries quantitatively, we can turn to the Chinn-Ito (CI) index of capital account openness measure that decreases with increasing restrictiveness of

the capital account (Chinn and Ito, 2009).¹³ If we examine the average level of exchange restrictiveness over SADC members compared to other global groups in Figure 1, it is evident that, on average, the SADC region has one of the world's most closed financial systems, only slightly less restricted than that of Sub-Saharan Africa, with an average index value of -0.365. Western Europe is comparatively the most liberal region, with a CI index score of 2.22 in 2010. This is not altogether surprising, given that most national governments still impose restrictions on capital mobility and foreign exchange transactions in order to hinder (either temporarily or permanently) the process of financial integration (Orlov, 2005), especially in developing countries (Prasad *et al*, 2003).¹⁴

In terms of movements in financial openness over time, Figure 1 supports the notion that between 2000 and 2010, global regions including SADC are endorsing exchange control liberalisation, though, relative to other groups, SADC has not made very sizeable progress in this regard. Indeed, the study of SADC exchange control liberalisation, conducted in 2012, revealed that only Botswana, Mauritius, Zambia and the Seychelles, constituting a mere 4 out of the 15 member states, had fully liberalised their controls by that year.¹⁵ Given that the majority of SADC countries have not removed exchange controls, what are the consequences of their liberalisation as part of the MU agenda?

Figure 1: Financial Openness of SADC compared to their global groups for 2000 and 2010



Source: Chinn and Ito (2009).

3.2 Theoretical Links between Trade and Exchange Controls

Although there is a theoretical basis for doing so, little research has been performed on the impact of exchange controls on trade compared with other known NTBs, partly owing to the difficulty of measurement. Whereas trade restrictions in some way curtail exports or imports

¹³ This presents an aggregate view of the overall financial restrictiveness of SADC with the CI index being the only other readily available index relating to exchange controls that spans all SADC members over a number of years. It is discussed further in Section 3.2.

¹⁴ See Johnston and Tamarisa (1998) for a discussion of controls following the Asian currency crisis and Prasad *et al* (2003) for a more specific view on net bank lending during this period.

¹⁵ Out of these, Seychelles only achieved full liberalisation after 2007, according to the study on SADC exchange control liberalisation conducted in that year.

of goods and services, exchange controls have to do with the payment side of the Balance of Payments (BOP) and tend to ration and regulate the right to buy, sell, or use foreign currency (Ohlin, 1937). Limits on foreign exchange transactions corresponding to trade are captured by those on the current account restrictions (see Section 4.1). For example, there may be a limit on the amount of foreign exchange permitted to pay for a current import shipment or a process of licensing may exist. While these exchange controls do not directly restrict trade, they effectively act as NTBs by creating a generalised tax on exchange related to trade. The liberalisation of exchange controls should facilitate the ease of transactions and the processes through which trade linkages are established and exploited. This has the effect of increasing the relative price of imports and/or reducing the quantity of imported goods. The consequent constraint to trade would be substantially amplified in the scenario if partner countries restrict imports simultaneously through this mechanism.

The substantial barriers to engaging in trade that are associated with controls on foreign exchange in trade-related transactions represents the most direct and fundamental link between exchange controls and trade. There exist a number of more indirect, overlapping channels through which this relationship manifests. Tamarisa (1999) provides a detailed outline of the basic transmission mechanisms through which foreign exchange controls can affect trade. These are extended by other literature and discussed hereafter to include the effects of reduced competition, transaction costs, limits to financial intermediation and hedging of exchange rate volatility; the exchange rate and its volatility; FDI and domestic savings and investment. As is evident upon closer inspection of these mechanisms, exchange controls can have conflicting effects on trade. It is important to note that, ultimately, the effect on trade by adjustments to foreign exchange and capital restrictions is contingent on country-specific profiles, trade structures, and the level of financial integration and other factors, which makes it important to test the relationship empirically.

Exchange controls limit inter-industry competition, which can in turn reduce trade capacity and diversity of products. The “infant industry” argument is routinely cited as a justification for exchange controls, where trade barriers (the generalised tax on imports) are put in place to protect a new, vulnerable, or politically important industry from potentially damaging external competition (Neely, 1999). However, where the infant industry strategy protects a single industry with a tariff, exchange controls act as a more generalised import tax across all sectors. The lack of selectivity makes this argument for exchange controls less effective as it will reduce competition on a large scale, which is generally advantageous for the home country but potentially detrimental to industry as a whole. Reduced competition can conceivably constrict accessibility to production processes, which limits the diversity of producers and products to be traded.

The costs associated with exchange controls incurred by businesses and potential traders are substantial. Firms can incur transaction costs associated with the time and capital employed in complying with (or evading) restrictions, which could reduce their ability to engage in trade. Contrastingly, this, coupled with the presence of high tariffs, can have a promotional effect on intra-regional trade in common currency areas (Whitten, 2012). In such a scenario, importers may avoid the costs associated with foreign exchange transactions by engaging in intra-regional trade instead. Capital controls can decrease imports by restricting the array of financial instruments available as protection against fluctuations in exchange rates, which undermine the efficacy of financial intermediation (Edison *et al*, 2002). Given that exchange rate volatility is often viewed as a fundamental concern for importers and exporters alike, the limit on financial instruments available for hedging purposes can reduce the appeal of engaging in trade at all. Certain constraints to financial intermediation may also reduce financing options for investors, which may discourage trade participation.

The exchange rate itself is directly affected by exchange controls, which influences trade ambiguously. On the whole, the presence of exchange controls is indicative of an overvalued exchange, which acts as a deterrent to trade. The appreciation that often accompanies the import restriction makes exports less competitive, forcing exporters to compensate by increasing productivity or reducing labour costs. Through this mechanism, exchange controls can act as an indirect tax on the labour content of exports (Greenwood and Kimbrough, 1987). In terms of exchange rate volatility, certain controls on capital stabilise the exchange rate through the corresponding reduction of speculative short-term flows (Kose and Prasad, 2012). In turn, a stable exchange rate theoretically encourages trade by reducing exchange rate risk of foreign investors, notably in the financial sectors of developing countries that lack the financial instruments to hedge such risk.

By encouraging domestic saving, capital controls can lead to higher domestic investment in general (Binici *et al*, 2010), though the presence of controls does not affect the soundness of investment decisions. If domestic savings are improved as a by-product, trade can be enhanced in cases where domestic investment decisions extend to trade-related institutions and infrastructure. Concerning domestic revenue, these controls provide a mechanism through which income from foreign origins that enters a country can be taxed, thereby expanding the domestic tax base (Bjerkhund and Schjelderup, 1995). This associated revenue stream may be sufficient enough to prompt governments to reduce tariffs, in turn facilitating trade creation.

Capital controls can also have an ambiguous effect on trade through their limit of flows of Foreign Direct Investment (FDI). FDI is restricted when controls pertain to surrender requirements, repatriation of profits and dividends, and foreign investment. This can have far-reaching consequences on an economy as FDI is widely accepted as an essential means of transferring human capital, technology, and of promoting learning-by-doing across nations (Alfaro *et al*, 2004). Accordingly, FDI flows can act as a useful impetus to trade and, if limited, can impede trade enhancement considerably. On the other hand, discouraging FDI through restrictions can lead to increased export activity through the tradeoff between tariffs and controls. High tariffs on trade often steer investors towards engaging in FDI instead. Conversely, when FDI is heavily restricted by controls, international investors may choose to export as an alternative, despite the presence of tariffs.

3.3 Empirical Effect of Exchange Controls on Trade

The theoretical basis for a relationship to exist between exchange controls and trade is supported empirically in recent research by Wei and Zhang (2007) and Tamarisa (1999). Both papers find that foreign exchange controls and capital restrictions act as a hindrance to global trade flow, with a restrictive effect comparable to that of tariffs. Firstly, both papers create an index using the IMF's AREAR.¹⁶ Secondly, the index is inserted into a gravity model of trade as a regressor, and its effect on bilateral trade is compared to measures of tariffs and, in the analysis by Wei and Zhang (2007), NTBs. Though these steps are common to both papers, the methodological approach and results of each paper illuminates a different aspect of the research and helps to shape our present investigation.

Tamarisa (1999) faces data limitations and consequently performs a cross-sectional analysis for the year 1996 and only includes the index of controls for 40 countries. The index is constructed for the current and capital account respectively and then averaged over the two in order to create an 'overall' index. These indices are then introduced one-by-one into the

¹⁶ This AREAR comprises the compilation of 196 countries' exchange controls over the last 40 years.

basic gravity model measuring bilateral exports, along with a measure of average tariffs, which, combined with the restrictiveness indices, capture comparable measures of distortions to trade. This investigation was extended almost a decade later by Wei and Zhang (2007) by expanding the coverage of trading partners and years, the empirical model and the extensiveness of robustness checks. Tamarisa's (1999) gravity model is applied to a panel setting in which the exchange control restrictiveness index covers an extensive 149 countries. In addition, the authors include an NTB index constructed by the IMF.

Furthermore, the estimation process is updated by incorporating the insights of Anderson and van Wincoop (2003) and Helpman, Melitz and Rubinstein (HMR) (2005; 2008). Anderson and van Wincoop (2003) proposes that ordinary Ordinary Least Squares (OLS) models (such as that by Tamarisa (1999) should include fixed effects in order to account for multilateral resistance or relative trade costs of trade partners that are found to be key in determining trade flows through both the intensive and extensive margins of trade. In addition, the OLS model also ignores zero trade flows and the heterogeneity of firms participating in trade, which results in sample selection bias and inconsistent estimates respectively. The HMR model 2-step model overcomes these flaws (Helpman *et al.*, 2005; 2008) and is applied by Wei and Zhang (2007).¹⁷ This model has been disputed in recent years, especially in the panel setting, where a probit specification will generate incidental parameter problems (Greene, 2003).

The results of the baseline model point to the fact that exchange controls can significantly hinder the flow of trade between countries, especially in the case of capital controls in developing countries. It is argued that while industrial countries are more financially open, developing and transitional economies maintain more stringent exchange controls and their effect on trade is accordingly substantial. This is consistent with other empirical literature (Prasad *et al.*, 2003). Contrastingly, countries included in the sample seem to boast comparatively open current accounts as corresponding controls are not found to present a significant barrier to trade. The aggregate restrictiveness index is shown to embody a consistently significant barrier to bilateral trade over a number of model specifications. Overall, Tamarisa's (1999) paper provides a useful preliminary methodology to encapsulate the relationship between trade and exchange controls.

Overall Wei and Zhang (2007) corroborate the conclusion of Tamarisa (1999), to find that there is strong and significant evidence in support of exchange controls as a constraint to trade. Namely, an increase of one standard deviation in the exchange control index relating to trade payments and other forex transactions (not related to trade or capital) has a comparable trade effect to a hike in tariffs by 13.9% and 11.3% respectively. Contrary to Tamarisa (1999), Wei and Zhang (2007) stress the NTB effect of foreign exchange restrictions that do not pertain to the capital account transactions. The inhibiting effect on trade is most substantial in the case of controls on export receipts and import payments.¹⁸ Furthermore, trade flows in less developed and more corrupt countries tend to be constrained to a marginally greater extent than those in more developed and less corrupt countries.

These papers provide a solid foundation on which to build this investigation. Apart from these two analyses, there is no direct research on the effect of exchange controls on trade. Both Wei and Zhang (2007) and Tamarisa (1999) present results relating to an average relationship

¹⁷ The first step involves the inclusion of a selection variable that captures the likelihood of firms engaging in trade in a probit model. Thereafter, the fitted errors are included in a second gravity estimation in the form of an inverse-mills ratio thereby controlling for the endogenous decision to engage in trade (Helpman *et al.*, 2008).

¹⁸ Only when examining the case of emerging markets during the Asian-Latin-American financial crisis, when countries reacted by increasing controls, are capital controls presented as a statistically significant barrier to trade (Wei and Zhang, 2007).

over a number of global countries, whereas this paper identifies relationships specific to SADC countries. It is useful to examine this in the SADC context, given the focus on trade expansion goals. A notable methodological contribution to the literature discussed is the application of the increasingly popular Poisson pseudo-maximum likelihood (PPML) estimation method, popularised by Silva and Tenreyro (2006, 2009), as a robustness check to the OLS model estimates. The PPML model corrects zero-trade and sample selection problems that the HMR model aims to do, but in a way that is less problematic in the panel setting. In addition, the technique avoids the log-linearisation of the model and thereby presents unbiased and consistent results even when the error term depends on regressors.

4 Exchange Controls Index for SADC (ECRI)

In light of the comprehensive empirical measures detailing the exchange control restrictiveness of SADC members, part of this paper involved the creation of an up-to-date, standardised index (ECRI). This section begins by briefly stating the theory of exchange controls, the tradeoffs involved with creating indices to measure their restrictiveness, and measures that inform this paper. The ECRI created is then explained and illustrated by an examination of cross-country restrictiveness over the last 10 years. It appears to vary significantly across countries and time, and seems to accurately reflect exchange control policies pursued by SADC countries.

4.1 Measuring Exchange Controls

The current and capital account line items of the Balance of Payments (BOP) may be restricted by exchange controls that cover various aspects of each account. A country's BOP records all transactions between residents and non-residents. Current account transactions address payments related to trade, factor incomes and financial transfers for the country. The capital account on the other hand captures changes in the ownership of domestic and foreign assets. Movements in financial flows, such as foreign direct investment (FDI), portfolio investment, other investment (like bank borrowing or lending) and reserve account transactions are all recorded in this part of the BOP (Krugman and Obstfeld, 2009). While exchange controls affect both the current and capital accounts, capital controls restrict and regulate cross-border capital transactions only (Kose and Prasad, 2012).¹⁹

Controls on current and capital transactions can assume a number of different forms. These range from limits relating to timing or reporting to requirements of licensing or permission from relevant authorities. They can also denote limitations on quantities or even ban certain transactions altogether. Three characteristics are common to most controls. That is that 1) they are linked to a specific line item within the BOP, 2) they differentiate between residents and non-residents and finally, 3) they account for the direction of the flow into or out of the country. Since 1950, the IMF has compiled a database of controls for each of its 187 member countries, which is reported in the AREAR. In order to analyse the degree of restrictiveness imposed on foreign exchange transactions, authors have turned to the codification of indices that capture the prevalence of the controls and their relative restrictiveness.²⁰ There are 3 main issues that need to be considered when creating such an index: 1) the detail included in

¹⁹ Once again, it should be noted that, in this paper, the term exchange controls refers broadly to either current account or capital account restrictions.

²⁰ See Chater (2012) for a comprehensive consolidation of some of the existing measures and indices created over the years.

the codification, 2) the coverage of the index and 3) whether the index will capture *de facto* or *de jure* controls. Measures based on the AREAR reflect *de jure* measures.²¹

A downfall of these types of measures is their inability to assess the effectiveness of the enforcement of controls which motivates a deviation from AREAR-based restrictions to *de facto* measures that capture actual capital flows. These, however, do not account for actual policies. Nor do they reflect subtle aspects of exchange policy such as attitudes towards controls and future intentions. For advanced economies, the correlation is high between *de jure* and *de facto* indices, whereas the difference between these 2 types of restrictiveness measures is large for developing countries (Prasad *et al*, 2003). There is no consensus in the literature on which control is more accurate. Although *de jure* measures are more popular and reliable, *de facto* measures may prove to be more useful. Until 1995, restrictions were coded in the AREAR as binary variables. Thereafter, the report became far more extensive and included detailed information on each exchange restriction. Many indices generated subsequent to this adjustment have still opted to use a binary measure to account for the presence of a restriction without taking into account the additional information. However, though more tedious, increased disaggregation of the indices is more desirable as it combats the tendency of available aggregated indices to either over- or understate the underlying dynamics between the controls (Schindler, 2009).

Examples of these indices that inform this study are those created by Tamarisa (1999), Wei and Zhang (2007), mentioned in the previous subsection, and Chinn and Ito (2009) (see section 3.1 above). Both Tamarisa (1999) and Chinn and Ito (2009) follow the *de jure* trends of this nature, covering 40 countries over 1 year and 182 countries over 30 years respectively. Both Tamarisa (1999) and Wei and Zhang (2007) separate the indices into disaggregated components with equal weightings and also an aggregated index. For Tamarisa (1999) these components are controls related to i) current account and ii) capital account transactions. Wei and Zhang (2007) separate the exchange controls into i) trade payments and outflows ii) foreign exchange transactions and iii) capital transactions. Wei and Zhang (2007) do not provide the actual index values used in their paper, nor do they specify the period it spans.

The “new measure of financial openness”, or CI index, was made publically-available in 2009. It is based on the binary dummy variables that codify the tabulation of restrictions on cross-border financial transactions reported in the AREAR. The CI index is very useful, considering it has been created for all countries in the world, thereby facilitating comparison across nations for a number of years. The CI index puts particular emphasis on the restrictiveness of the latter in order to capture financial restrictiveness specifically. It is important to note that a zero value is assigned to the restricted components, meaning that higher index values correspond to higher levels of financial openness (Chinn and Ito, 2009). Furthermore, it does not provide a disaggregated version of the index so that the individual categories of controls can be analysed.²²

²¹ Share indicators that capture years of liberalisation as a proportion of unliberalised years have also been created for a similar purpose (Edison *et al*, 2002).

²² The index generated and provided by Schindler (2009) is very similar to the CI index in its construction, the fact that it captures financial restrictiveness and is also easily-accessible and spans an extensive number of countries (91) and is comparatively more disaggregated. However, the data does not extend past the year 2005 thus it is not included in this paper. See Chater (2012) for correlation information between this index and the ECRI.

4.2 SADC Exchange Control Restrictiveness Index (ECRI)

Building on the indices generated by Wei and Zhang (2007) and Tamarisa (1999), a new exchange control restrictiveness index (ECRI) is constructed to provide an accessible measure of comparative and overall restrictiveness across SADC member states, in order to assess the viability and consequences of the proposed regional integration plan being pursued within the regional bloc (outlined in Table 1). In terms of the compromises outlined above, the index is a *de jure* measure, based on the AREAR and uses an ordinal ranking for each line item evaluated.²³ This paper presents the ECRI for 11 of the 15 SADC member states for the years 2000 to 2010.²⁴

For each country, the same set of 75 key restrictions is coded to create an aggregate score. Those 75 restrictions can be grouped into 5 broad categories, each of which forms its own sub-index, namely restrictions on foreign exchange associated with goods, services, capital, the financial sector, and those applying to all categories, as outlined in Table 3. This paper codes each category by assigning scores ranging from 0 to 8, depending on the type of restriction, as opposed to following the binary coding system, which excludes important information and oversimplifies the extent and intensity of controls and the variation between divergent exchange control descriptions. Specifically, at their least restrictive, a limit is coded as 2 if it is just a matter of timing or reporting, and 8 for a quantitative restriction. As such, a *higher index score* denotes a *more restrictive policy*, opposite to the CI index. See a more detailed description of the index below.²⁵

As with all methods applied in generating indices, this new methodology is not without its caveats. Firstly, the index generates a downwards bias when line items are missing. This occurs when information on a particular category is not available, reported or applicable, and is removed from the overall count. This lowers the restrictiveness index count overall, which may provide a skewed vision of the exchange control openness of each country especially in 2000 when many fields of information are reported missing. Secondly, in the case of a quantitative restriction, the line item is coded as an '8' but does not account for the fact that the restriction may be binding but somewhat generous. Despite these weaknesses, this new index provides an ordinal view of the restrictiveness of exchange transactions in SADC countries and reflects each country's exchange control history quite closely as is investigated in the section 4.3.

4.3 Analysis of SADC Exchange Control Indices

Table 3 presents summary statistics of the created index and its 5 sub-indices for 2010. It shows the relative restrictiveness of each category, revealing that the current account is less restrictive than the capital account and financial institutions, as in accordance with expectations. Controls on the capital account represent the category with the highest average restrictiveness, with restrictions on foreign exchange transactions related to goods being the least restricted. Evidently, controls on the current account (captured predominantly by indices on goods and

²³ The decision to create a *de jure* measure requires a taxing codification process of the AREAR which was conducted in collaboration with Rachel Chater and Dr. Mark Ellyne. See Chater (2012) for greater detail on the motivation behind creating the new index, the construction thereof, and its comparison to other indices.

²⁴ See Appendix D for the summary statistics of each index category for each country. Note that South Africa is the only SACU country included in our analysis to correspond with the trade data used in the following section. Ultimately, the trade flows of the customs union is adequately represented by those of South Africa. For consistency, the exchange controls related to these countries are also excluded.

²⁵ See Appendix A for more detailed information on the construction of the index outlined by Chater (2012) and for a list of the types of transactions that are listed in the AREAR and subject to controls.

services), while boasting the lowest restrictiveness scores, are still prevalent in SADC. Restrictions on exchange relating to service transactions varies the most across SADC states out of all sub-indices. It is interesting to note that the cross correlation table between sub-indices (Table 7 in Appendix C) indicates that the more restrictive a country is with regard to one control, the more likely it is to be restrictive in other categories.²⁶

Table 3: Summary statistics for 2010

Control Index	Restrictions	Mean	Std. Dev.	Rank
Goods	12	0.337	0.113	4
Services	10	0.359	0.272	3
Capital Account	14	0.415	0.198	1
Financial Sector	12	0.363	0.204	2
Applying to all	27	0.318	0.134	5
Overall	75	0.352	0.155	

A number of countries have restrictions above average, and only fully liberalised countries have completely liberalised exchange controls on services transactions. A few fundamental restrictions remain on the current account and cut across all non-fully liberalised SADC countries. For example, the requirement restricting the repatriation of exports proceeds remains over all 10 non-liberalised countries. Authorities have justified the maintenance of this control as a method of deterring capital flight and maintaining foreign reserves (Ellyne and Letete, 2012). Some of these countries justify the maintenance of the surrender requirement on the basis of a lack of foreign exchange liquidity in the banks (Malawi and Mozambique). Furthermore, at least 4 countries in the SADC still have significant parallel exchange markets operating, which indicate some disequilibrium in their official foreign exchange market.

Figure 2 shows that since 2000, a majority of SADC member states decreased their restrictiveness, possibly as a result of pressure from the SADC regional integration scheme. Figure 4 in Appendix A presents the corresponding representation comparing 2005 to 2010. Indeed, the decline in average restrictiveness is far more prevalent after 2005, whereas only 2 countries had reduced overall controls between 2000 and 2005 (see Table 8 in the Appendix C). The DRC stands out as having reduced restrictiveness substantially between 2000 and 2005, compared to the subsequent 5 years. This trend reflects a commitment to the liberalisation effort that came about after the publication of a SADC report in 2007. The report calls for SADC countries to relax exchange controls as a step towards harmonising policies and promoting economic integration. It is evident, though, that progress towards exchange liberalisation since 2007 has been scattered (Figure 3). The more restrictive countries include the DRC, Malawi, Mozambique, South Africa and Zimbabwe, who have a higher mean score of restrictiveness than the average level over the 10 years (Figure 3a).²⁷ The remaining SADC countries fall into the less restrictive category (Figure 3b).

Substantial changes took place in countries that became less restrictive over the 10 year period, ranging from an approximate 10% decrease in South Africa to a 50% decrease in Zimbabwe (Figure 9 in Appendix C). The sharp drop in the ECRI for the Seychelles accurately

²⁶ See Appendix D for various representations of the ECRI values and movement over time for each SADC country.

²⁷ Angola is removed from this investigation as AREAR information is not available for 2007 and 2009. Angola is found to be one of the most restrictive countries, though, with an exchange control index of 0.56 in 2010, almost double that of Zimbabwe. See Appendix D.

Figure 2: SADC ECRI for 2000 vs. 2010

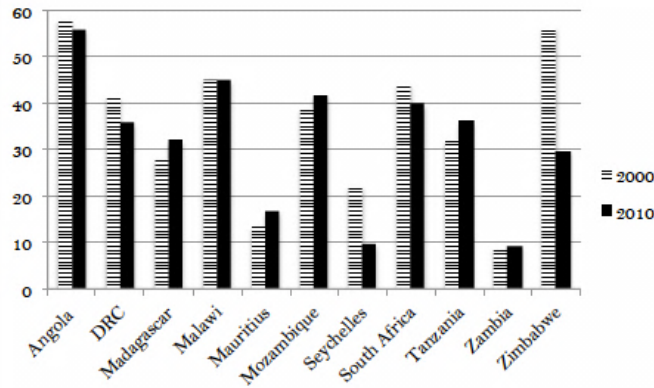
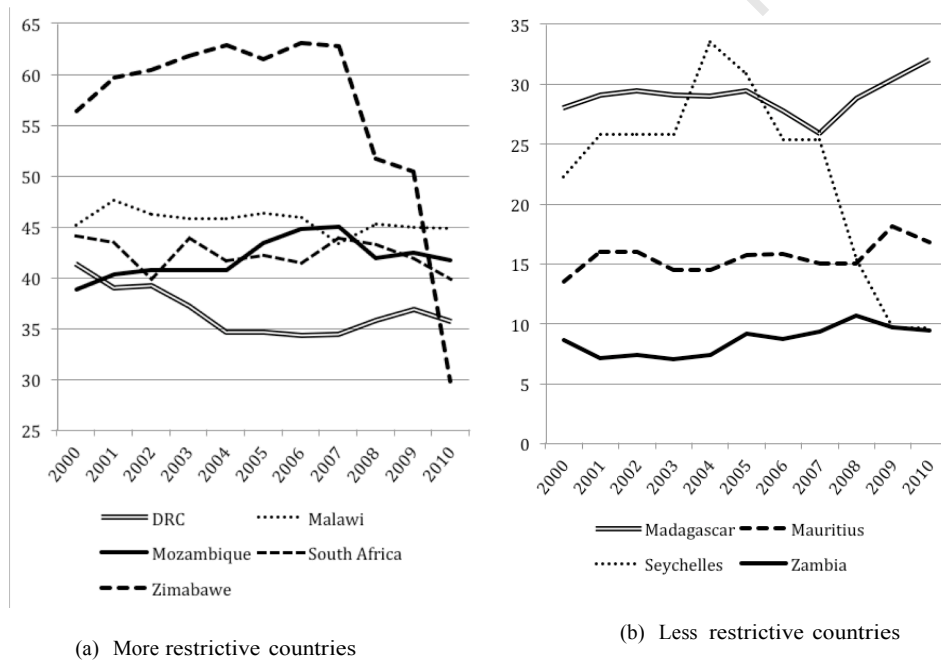


Figure 3: Movement in Overall Index across SADC States from 2000-2010



reflects their move to abolish controls on the current and capital accounts in November 2008, as part of a broader set of liberalisation measures undertaken in response to deepening macroeconomic problems. Similarly, Zimbabwe stands out markedly for undertaking a major liberalisation in 2009. The index captures Zimbabwe’s highly controlled exchange regime in 2005, before its official dollarisation and liberalisation in 2009. Other than Zimbabwe and Seychelles, Mozambique has made substantial initiative to liberalise recently, and Malawi has recently endeavoured to do so by floating its currency in May 2012.²⁸ On the other hand,

²⁸ See Ellyne and Letete (2012) for more detailed information on SADC liberalisation progress based on the ECRI. For example, prior to liberalization in 2008, Seychelles had experienced rising debt, fiscal problems, declining

Madagascar and Mauritius became slightly more restrictive over the last decade. However, they still maintain relatively lower scores and are accurately classified in Figure 3(b) as less restrictive. Overall, SADC countries still need to make substantial effort towards liberalizing exchange controls further and it is evident that contrary to popular opinion, exchange controls are still relatively binding in the region with member states facing varying average restrictiveness over time (Appendix D).

5 Empirical Analysis

In order to investigate the relationship between exchange controls and SADC trade flows, the author estimates an augmented version of the gravity model of trade that incorporates insights of Anderson and van Wincoop (2003) by Ordinary Least Squares (OLS) estimation in the panel setting. In addition, estimation of the model using Poisson pseudo-maximum likelihood (PPML), as popularised by Silva and Tenreyro (2006; 2009), is applied to check the consistency of the OLS results.

5.1 Empirical Model

Since its introduction by Tinbergen in 1962, the gravity model of trade has been widely applied to investigate the determinants of patterns of trade flows between trading partners. It essentially applies Newton's gravity theory to the trade setting, where the volume of trade between 2 countries is directly proportional to the "mass" of each, often captured by a wealth or population variable, and inversely related to the distance between the two. The most common practice in empirical applications has been to log-linearise the original multiplicative model in order to perform estimation by OLS. This model has been very successful empirically, due to its high explanatory power over various specifications and adaptations i.e. R^2 is almost always close to or above 60%.

A notable augmentation of the original model was popularized by Anderson and van Wincoop (2003), who propose that there exist underlying trade costs between two countries that manifest in a strong border effect or multilateral resistance that generates a substantial bias when ignored. Baldwin and Taglioni (2006) characterise such an omission as the "maxi-gold medal mistake" in panel gravity estimation.²⁹ Most trade research bypasses this error or reduces the corresponding bias by including fixed effects that capture, for example, separate country (Rose and Glick, 2001) and time effects, or pair effects (Rose and van Wincoop, 2001) or corresponding time-varying alternatives (Wei and Zhang, 2007). The choice of fixed effect to control for van Wincoop (2003)'s multilateral resistance terms depends on the topic being investigated. For the purposes of this paper, nation and time fixed effects are included as this combination has been shown to reduce the bias satisfactorily (Baldwin and Taglioni, 2006).³⁰ Our model incorporates these findings:

foreign exchange reserves and deteriorating international competitiveness, leading to BOP problems and other imbalances. Widespread liberalisation reforms were implemented, including the floating of the exchange rate and the removal of exchange controls. Currency depreciation and a surge in inflation followed the move. However, the situation has now settled with growth, inflation and exchange displaying relative stability and favourable rates, and BOP and fiscal deficits have reduced. Though premature, indications suggest that the economic reforms, one of which was exchange control liberalization, generated a foundation for sustainable future growth.

²⁹ "Silver" and "bronze" mistakes constitute the skewness caused by aggregating bilateral trade flows and the bias associated with using prices to deflate GDP respectively, whose corresponding biases can also be corrected largely by fixed effects estimation (Baldwin and Taglioni, 2006).

³⁰ Time-varying fixed effects would wipe out the time-varying aspect of the ECRI and its sub-indices, including country-pair dummies, capture unobservable trade costs that vary by country pair which is unlikely

$$\ln(M_{ijt}) = \beta_0 + \beta_1 \ln(Y_{it}) + \beta_2 \ln(Y_{jt}) + \beta_3 \ln(X_{it}) + \beta_4 \ln(X_{jt}) + \beta_5 \ln(D_{ij}) + \beta_6 \ln(d_{ij}) \\ + \beta_7 ECRI_{it} + \beta_8 T_{it} + \beta_9 N_{it} + \ln(\eta_{ijt}) \quad \text{--- (1)}$$

where M_{ijt} represent one way trade (annual imports) from countries j to countries i (SADC members) at time $t = 1, \dots, T$ and η_{ijt} captures the error term. GDP and GDP per capita of importing (Y_{it} and X_{it}) and exporting countries (Y_{jt} and X_{jt}) as well as the distance between them (D_{ij}) are included as baseline explanatory variables. To account for historical and cultural factors affecting SADC trade, 2 standard dummy variables (d_{ij}) are incorporated that capture whether trading partners share a border and common language respectively. As an extension, a SADC RTA dummy variable is included to capture the average trade effect of membership to SADC (1 when exporter is a SADC country and 0 otherwise) as an extension. In order to account for multilateral resistance, individual importer, exporter and time dummies are incorporated as fixed effects (θ_i , θ_j and λ_t) respectively). In addition to the baseline variables, the restrictiveness indices are introduced as the trade distortions of interest. Firstly, the ECRI and its sub-indices ($ECRI_{it}$) are introduced separately, along with an index measure of tariff restrictiveness (T_{it}) à la Tamarisa (1999). As per Wei and Zhang (2007), we chose a proxy for non-tariff barriers (N_{it}) that captures regulatory constraints to importing, discussed in the subsequent section.

Estimating trade relationships such as that specified by (1) using the OLS specification exclusively is certainly in line with extensive trade research. However, recent trade theory developments have raised several biases that arise through the least squares approach. Notably, estimation by OLS specifies a log-linearised specification which i) leads to inefficient and inconsistent results in the presence of heteroskedasticity and ii) truncates observations for which trade is zero by virtue of the logged dependent variable (Silva and Tenreyro, 2006; 2009).³¹ These issues are evaded by the PPML, which allows for the dependent variable to be in levels. This means that zero trade is dealt with and consistent estimates are generated by the model regardless of whether the error terms (η_{ijt}) depend on regressors. The latter correction follows, given that the OLS assumption on the independence of the error variances is relaxed to require only the proportionality between the mean and variance of the errors, though the model performs if this requirement does not hold (Silva and Tenreyro, 2009).

Apart from the PPML model, a range of alternative approaches have been proposed to deal with heteroskedasticity (e.g. Porojan, 2001) and zero values (e.g. Helpman *et al*, 2008). Each has been shown to accompany considerable problems and limitations over various specifications (Silva and Tenreyro, 2006). For example, this paper inflates zero-trade by $\ln(1 + M_{ij})$ in order to incorporate these observations, though this method is not necessarily supported by theory.³² The PPML stands out as a tractable way of dealing with both problems and is thus becoming increasingly popular in trade research. For the time being, though, it remains a useful comparative tool to confirm OLS results rather than as a stand-alone estimation method (Silva and Tenreyro, 2010). Furthermore, fixed effects can be applied to the PPML model with relative ease (Westerlund and Wilhelmsson, 2008).

The treatment of zero-trade is especially relevant in the African context, where countries in the case of SADC countries, where unobservable variables are less likely to vary by trading partners compared to SADC-specific factors over time. Nevertheless, country-pair effects are included as sensitivity checks, where results are broadly consistent with those reported in Section 5 and are available upon request.

³¹ Jensen's Inequality informs (i) i.e. $E(\ln[Y]) = \ln(E[Y])$, is overlooked when log-linearising for OLS, a process which makes the dependent variable $\ln(E[Y])$. The expected mean of a random variable is inherently dependent on its own mean and higher-order moments of the distribution thus the homoskedasticity assumption of the OLS model is undermined (Silva and Tenreyro, 2003; 2006).

³² The HMR selection model as described in the Wei and Zhang (2007) paper is likely to be biased by incidental parameter bias when the first stage probit is performed in a panel environment.

are particularly limited in trading partners compared to global groups. Zero-trade accounts for about a quarter of our dataset. Recent trade literature presents increasing applications of the PPML to the African environment (e.g. Behar and Manners, 2010; Qureshi, 2008; Sattayanuwat, 2011). If excluded from the model, as is the case when the dependent variable is logged, sample selection bias arises. As a cautionary note, the PPML assumes both zero and non-zero trade are drawn from the same distribution. The PPML version of the model is estimated from the multiplicative form and takes the exponential regression functional form:

$$M_{ijt} = \delta_0 Y_{it}^{\delta_1} Y_{jt}^{\delta_2} X_{it}^{\delta_3} X_{jt}^{\delta_4} D_{ij}^{\delta_5} d_{ij}^{\delta_6} e^{\delta_7 ECR_{it} + \delta_8 T_{it} + \delta_9 N_{it} + \varepsilon_{ijt}} \quad (2)$$

where the model's explanatory variables are analogous to those in the OLS specification (1) and importer, exporter and time dummies are included, as in the OLS model. The error term is now captured by ε_{ijt} . This being said, the focus of this paper is not to investigate and compare the econometric soundness of the 2 models as many papers have done (e.g. Martin and Pham, 2008; Martinez-Zarzoso *et al*, 2007) but rather to use this discussion to justify the use of the PPML model results as a comparative measure of the OLS results, given its ability to deal with potential biases.

5.2 Data

Annual trade data has been collected from the IMF Directions of Trade Services (DOTS) for imports flowing to 11 SADC members from 38 global trading partners from 2000 to 2010 (including most SADC members).³³ The explanatory dummies and the distances between countries are extracted from the CEPII database. Data on GDP and GDP per capita for each country are retrieved from the World Bank Development Indicators (WDI).

The variable of interest is the new SADC ECRI and its sub-indices created for 10 years. Measures of tariffs and NTBs are included to provide for comparison purposes à la Wei and Zhang (2007). Given the difficulty in attaining data on average tariff rates and the complexity of SADC tariffs barriers to trade, the tariff and NTB variables included in the model require some attention. In both cases we resort to indices of *openness* as reported in the Economic Freedom of the World database (EFW). For the purposes of this paper, the author focuses on a *mean tariff rate* over all applicable import tariffs captured by an index from the EFW, which is derived directly from individual countries' WTO Tariff Profiles.³⁴ This sub-component is based on the unweighted mean of tariff rates reported in various issues of the WTO World Tariff Profiles.

The formula allocates a rating of 10 to countries that do not impose tariffs and decline as the mean tariff rates approach 50% for most restrictive countries. Accordingly, as the "mean tariff rate" increases, countries are assigned lower ratings. The index is constructed via the following, where Ω_i represents the country's mean tariff rate while the values of Ω_{min} and Ω_{max} are set at 0% and 50% respectively.³⁵:

³³ See Appendix E for a list of exporter countries. These include most SADC countries to encapsulate extra- and intra-regional dynamics. It must be noted that trade data for SACU countries other than South Africa is not included i.e. Botswana, Namibia, Lesotho and Swaziland and as such are excluded from the ECRI analysis above for consistency sake. It is widely acknowledged that SACU trade consists primarily of South African trade (Edwards and Behar, 2010: 7) and it is thus reasonable to assume that the SACU trade flows are adequately captured by incorporating South African trade data, without reducing the credibility of our results.

³⁴ This was found to be the most extensive dataset of SADC tariff rates compared to other average tariff datasets available such as the WDI. Data from the WITS TRAINS database are too disaggregated for the purposes of this paper.

³⁵ The selection of 50% as the upper bound of the tariff rate is acceptable given that only 2 or 3 countries have tariff rates that exceed this range.

$$\frac{\Omega_{max} - \Omega_i}{\Omega_{max} - \Omega_{min}} \times 10 \quad \text{--- (3)}$$

A measure of NTBs captures *regulatory trade barriers* using a measure of the compliance time costs incurred when importing and exporting made available by the World Bank report on Doing Business.³⁶ This is captured by the “time cost of procedures taken to import a full 20 foot container of dry goods that contains no hazardous or military items” measured in the number of calendar days which averages the days taken to export a good and those taken to import a good. It combines these with survey results from the Global Competitiveness Report that asks whether tariff and NTBs are viewed as significant barriers to the ability of imported goods to compete in the domestic market.

Similar to the tariff index, the NTB index takes 0 to 10 ratings, where countries that take longer to import and export are given lower ratings. This index is also constructed using equation (3), where Ω_i now represents the cost value of time measured in days. Ω_{max} is set at 1.5 standard deviations above the average number of days and Ω_{min} is set at 1.5 standard deviations below the average at 62 and 80, and 2 and 0 days respectively. Ratings of zero or 10 are assigned to countries that are outside this specified range. In light of lack of data for tariffs and NTBs, these indices are seen as adequately useful, given that they are generated from reliable data sources and constructed in a transparent way.

This paper transforms the index data so that the tariff and NTB indices measure *restrictiveness rather than openness*, and thus increase with greater restrictiveness, in line with the ECRI. This is done by merely multiplying the index by -1 so that a *higher restrictiveness* corresponds to a *less negative* score and a lower restrictiveness generates a value closer to -10. There is a certain consistency in the fact that the regression model thereby compares 3 indices that each capture the restrictiveness of respective trade distortions i.e. these 2 EFW indices and the ECRI. Table 4 presents pairwise correlations between the 2 indices and imports. In accordance with expectations, higher mean tariffs and more burdensome time costs of engaging in trade are associated with lower imports. It is furthermore useful to note that there is not much correlation between the index variables themselves.

Table 4: Cross-correlations of EFW indices and Imports

Variables	Imports	Tariffs	Non-tariff barriers
Imports	1.000		
Tariffs	-0.149	1.000	
Non-Tariff Barriers	-0.191	0.310	1.000

Note: EFW indices have been adapted so that each index increases with increasing restrictiveness.

5.3 Results

In this section, the effect of the ECRI and its sub-indices on SADC imports is tested using the OLS and PPML models. All the output, barring the benchmark model, is included in Appendix F.

³⁶ For this database see <http://www.doingbusiness.org/> and the database used to create the tariff index is <http://www.weforum.org/en/initiatives/gcp/index.html>.

5.3.1 Benchmark Model

Table 5 shows that the results presented by this paper are generally consistent for the benchmark model, whether estimating the gravity model by OLS or PPML. Whether NTBs are included ([3] and [4]) or not ([1] and [2]), the baseline variables are highly significant and generally accord quite closely with a priori expectations that the income elasticity of trade is close to unitary elastic in the case of importer (SADC member) GDP (ranging between 0.9 and 1) and, likewise, that a 1% increase in the distance between trading partners reduces trade by around 1%. The results differ when the effect of exporter GDP is considered, where in the PPML case the effect of the exporter's GDP is bigger than expected with an estimate higher than 1.5% though OLS boasts an estimate close to that on importer GDP. This is a possible cause for concern and further analysis of the data should be conducted to illuminate the reasons for this singular divergence.

Nevertheless, the inflated effect is persistently significant across all models (Tables 5-14) and represents the only major deviation between the 2 estimation techniques and suggests an interesting dynamic that is indicative of the specific trade relationship of this paper. The exaggerated effect of the partner country GDP on SADC imports can be justified when considering the distortionary effect of smaller exporting countries in the total concentration of imports to the trade bloc. This estimate could be capturing the effect of increasing import dependence of SADC countries on each other, specifically on South Africa (see Section 2.2). Compared to other partner countries, like China, these countries have not boasted large changes in GDP over the last 10 years and are comparatively smaller than other exporting partners, which would magnify the effect of small changes in their GDP on average imports over the years.

Sharing a border and official language represent significant drivers of increases in average SADC trade growth between 2000 and 2010, with reasonable magnitudes over both models. For the OLS model (1), ceteris paribus, contiguity has increased trade by 0.86% ($e^{0.0086} - 1$) over the decade. Sharing an official language corresponds to a 0.5% ($e^{0.005} - 1$) increase in imports. The estimate on the common language is higher for PPML, which is not unreasonable. Sharing a border has a prominent effect, especially considering the increased dependence on other SADC members, specifically for imports over the past decade. OLS estimates on the dummy capturing shared language is logical given that a common language is likely less important to SADC imports as trade patterns are globally dominated by BRIC and EU countries that do not generally have the same official language. Indeed, discrepancies between the models are expected, given the corrections afforded by PPML estimation.

With regard to the variables of interest, there is significant evidence to suggest that, keeping all else constant, overall SADC exchange controls as measured by the ECRI have acted as non-tariff barriers over the 10 year period from 2000, with a constricting effect on average SADC imports over this 10 year period. The gravitas of this result is supported by the fact that the magnitude and direction of the effect is consistent and almost identical across OLS and PPML. The measurement of the actual effect is not straightforward, and, indeed, a drawback of using indices as regressors is the difficulty associated with interpreting their coefficients.

An examination of the change in restrictiveness from the 25th and 75th percentiles of the index can give us an idea of the magnitude of the effect on average imports, though, this is an imperfect calculation. We demonstrate this for the OLS case (1), which excludes the NTB index. On average, an increase in exchange control restrictiveness from 25 (given by the Seychelles in 2001) to 44 (given by Malawi in 2010) has led to a 14.13% ($e^{[19 \times -0.00802]} - 1 \times 100$) decrease in imports to the SADC. When the NTB index is included (3) this result increases marginally i.e. when the restrictiveness of exchange control index increases from 25th percentile (given by the Seychelles in 2001) to the 75th percentile (given by Malawi in 2010), average SADC imports is reduced by 19.09% ($e^{[19 \times -0.00101]} - 1 \times 100$). As mentioned, the

size effects on average trade generated by the PPML model barely differ from those of the OLS model and, as such, the quantified result will be similar.

The other trade distortions included are the indices capturing the restrictiveness of tariffs and time cost regulatory tariff barriers. While the persistent significant estimate of the former over both OLS and PPML models (indeed, this is the case for all specifications from Table 5-Table 14), there is weak evidence to support a similar consistent effect of regulatory trade barriers on average imports over the specified period. Higher time costs of importing present a significant deterrent to trade in the OLS model, even more than that of tariffs, which is not unlikely (Portugal-Perez and Wilson, 2008). However, the PPML model reports that there is no evidence to support this relationship. Consequently, we are inclined to question the significance of this determinant of SADC imports.

This is not unexpected considering the relatively widespread insignificance of similar NTB indices investigated in aggregate preliminary models for the SADC by Edwards and Behar (2011) and the fact that other NTBs such as infrastructural weakness are more relevant to the African case (Portugal-Perez and Wilson, 2008). Indeed, the variable also only captures a small aspect of the possible NTBs prevalent in the region. Nevertheless, Table 5 shows that the other estimates are practically analogous when the NTB index is included or not, and so we find it appropriate to incorporate the variable in the following regressions for the sake of consistency. It is the author's conclusion that more research needs to be conducted on other existing indices that capture the NTB effect.

5.3.2 Further Empirical Results

The additional models run are included in Appendix E. When disaggregating the ECRI into its 5 sub-indices over models (1) to (5) in Table 9 and 10, the OLS and PPML estimations both report the significance of foreign exchange transactions relating to services (3) as a restriction on imports with a bigger constraining effect in PPML estimation (-0.00734 as opposed to -0.00424 in Table 9) an increase in restrictiveness of service transactions from 11.11 (corresponds to Madagascar in 2005) to 57.5% (corresponding to Malawi in 2005). In addition, restrictions on exchange related to goods becomes significant in the PPML model whereas the OLS model reports the restrictions applying to all exchange transactions to be significant barriers to average SADC imports over the period. This result is indicative of the interplay of the sub-indices between goods, services and restrictions. The former 2 categories are specific to trade payments, and the latter involves exchange rate considerations (see Appendix B).

Indeed, Table 7 in Appendix C shows the exceptionally high pairwise correlations between the variables, especially goods and services. The implications of this is that the disaggregation of the indices into 5 categories (as opposed to just 3 à la Wei and Zhang, 2007) may be an overkill when estimating their individual effects, which end up covering an undesirably small number of exchange restrictions per category (see Table 3). It may be appropriate to lump services and goods together under current account restrictions as past literature has done. As such we find it satisfactory to interpret the significance of either goods or services restrictions or both as indicative of the overall current account control effect. Indeed, this current account restrictiveness effect seems to present a significant barrier to imports over the 2000-2010 period. The significance of the restrictions applying to all categories, (5) in Table 9, is in line with Wei and Zhang (2007), and also likely captures the overlapping effects of the other categories. Overall, the transaction costs generated by restrictions on the current account seem to dominate the ECRI effect on trade.

Contrastingly, there is no evidence to suggest that controls on the capital account or financial sector have had a significant effect on average trade flows to the region over the last

Table 5: ECRI across Both Models

	(1) OLS	(2) PPML	(3) OLS	(4) PPML
Log GDP SADC	0.900*** (0.154)	1.000*** (0.156)	0.939*** (0.176)	0.975*** (0.165)
Log GDP exporter	0.902*** (0.288)	2.043*** (0.205)	0.986*** (0.327)	2.051*** (0.210)
Log distance	-0.836*** (0.182)	-0.993*** (0.259)	-0.871*** (0.193)	-0.970*** (0.274)
Common border	0.618*** (0.139)	0.763*** (0.229)	0.644*** (0.149)	0.795*** (0.239)
Common language	0.418*** (0.0736)	0.739*** (0.135)	0.428*** (0.0782)	0.724*** (0.138)
Tariff index	-0.0699*** (0.0190)	-0.129*** (0.0236)	-0.0488*** (0.0179)	-0.123*** (0.0277)
NTB index			-0.0830*** (0.0277)	-0.0343 (0.0336)
ECRI	-0.00802*** (0.00303)	-0.0164*** (0.00482)	-0.0101*** (0.00291)	-0.0168*** (0.00469)
Observations	3434	3434	3144	3144
Adjusted R^2	0.592	0.952	0.594	0.955

The dependent variable takes the form of $\log(1 + imports)$ in models (1) and (3) and level $imports$ for (2) and (4). Robust standard-errors in parentheses are clustered by importer over time. Importer, exporter and year fixed effects are applied. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

10 years similar to the results of Wei and Zhang (2007). The robustness of this result over both PPML models is verified by the insignificance of the comparable Chinn-Ito (CI) index that measures financial liberalisation (as discussed in Section 3.1 and 4.1) in Table 8. As a side note, the direction of the CI index displays a constricting effect on trade only in (4) estimated by the PPML model.³⁷ Overall, all ECRI sub-indices have the same directional (reducing) effect on trade.

As an extension, a SADC RTA dummy (equal to 1 when exporter is also a member of the SADC) is included in the benchmark models in Table 12 and their corresponding coefficient estimates demonstrate that there is no evidence to support the claim that average SADC imports have been significantly improved by membership of the preferential (now free) trade area between 2000 and 2010.³⁸ This is in accordance with results discussed in Section 2.2.

Furthermore, as a preliminary extension to the benchmark models presented, we include

³⁷ The abovementioned notion, that the indices presented are too disaggregated and may not afford very useful coefficient estimates, does not apply to this result on capital. If we had undertaken less disaggregation, the categories would have captured capital account related transactions as a sub-index and, as such, this result is useful and reliable.

³⁸ As a stylistic note, the variable label "SADC RTA" as opposed to "SADC FTA" is more appropriate, given that the FTA was only established in 2008.

corruption indicators as measures of corruption, reported by the Global Competitiveness Report, to account for some institutional effect of SADC countries for interest sake. As such, Table 13 and Table 14 include the ECRI and a few of its sub-indices (goods, services and applying to all) respectively, in addition capturing governance and interaction terms between ECRIs and the corruption variable. Ellyne and Letete (2012) note that some large prominent private sector businesses in the SADC expressed serious concerns about the level of corruption in the region as a sizeable hindrance to do business in such places. Such factors are expected to dwarf the impact of exchange controls on trade.

Indeed, most exchange controls become insignificant in the presence of the institutional index. Restrictions on services stand out as a highly significant barrier to trade, even in the presence of governance variables, though the magnitude of the effect is unchanged without this variable. Corruption levels are likely to affect the prevalence of exchange controls and, indeed, the correlations between this index and various institutional indices are high (Chater, 2012). Interestingly, models (1), (2) and (7) demonstrate that the estimates on tariff and non-tariff barrier restrictiveness indices become closer in their effect on trade when the corruption index is included, decreasing the relative significance of the non-tariff index. This suggests that the costs of engaging in trade may capture an element of governance quality, which makes its inhibiting effect on trade larger when the corruption variable is excluded (Table 10). The corruption variable is generally a negative barrier to trade, significant in PPML models (3) and (8). These results should not be given undue importance though, but should rather be treated as an exploratory model to demonstrate the importance of considering institutional factors to inform the conclusions of the baseline results.

5.3.3 Caveats to Results

Though the results presented are interesting, we must examine the points of weakness on which future research can focus. Endogeneity is a persistent cause for concern in this regression model as countries that have more restrictive exchange control policies may tend to have lower trade (Tamarisa, 1999; Wei and Zhang, 2007). An example of this is the link between exchange controls and an overvalued exchange rate which could itself play a part in reducing trade. In order to incorporate this consideration in future explorations of the model, a continuous exchange rate variable could be included in the regression. Furthermore, the specifications do not account for a number of factors that are indicative of the SADC experience, especially given the lack of evidence supporting the regulatory trade barrier index as a viable proxy for NTBs in the region. Ideally, the relationship should be tested over other datasets, with aggregated tariff data. The database is also rather small, and although zero trade is included to reduce the corresponding sample selection bias, this bias associated with the small sample size may still lead to inconsistent results.

The fact that the *de jure* measures do not take into account the actual enforcement of controls could explain the general insignificance of sub-indices as barriers to trade. Making use of the *de jure* measures does not consider whether the controls are actually binding or not which is indicative of the index coding method, as discussed in Section 4.2. Indeed the 2012 Study on SADC Exchange Control Liberalisation revealed that private sector members did not identify exchange controls on merchandise flows as a concern when outlining perceived impediments to the promotion of a successful SADC FTA (Ellyne and Letete, 2012). This is likely due to the fact that these controls are not properly enforced by governing bodies. The effect of inept institutions that reduce the effective enforcement of these controls would be captured by an alternative *de facto* measure. A final consideration concerns the fact that the sub-indices capture less information than that of the overall index and may not vary enough over the years to generate reliable results as individual regressors in the panel model. These concerns should be taken into account, though the results can still be interpreted with confidence especially given their robustness over the OLS and PPML models.

6 Discussion

The paper's conclusions are two-fold. Firstly, it is evident that exchange controls persist in the SADC. Secondly, these restrictions to transactions related to foreign exchange have acted as a significant barrier to member countries' average imports between 2000 and 2010, a result that corroborates research by Tamarisa (1999) and Wei and Zhang (2007). The effect is driven particularly by the current account, which faces persistent restrictions, though their prevalence varies considerably across member states. In this way, exchange controls seem to be acting as non-tariff barriers, inhibiting trade to the region from SADC and non-SADC trading partners, by increasing the costs of engaging in foreign exchange transactions and related to trade activities. Capital constraints have not presented noticeable restrictions on trade, though their effect is likely too indirect to capture in the restrictiveness component alone.

Overall, these results are consistent over both the OLS and PPML estimations of the augmented gravity model, except for the insignificance of the chosen non-tariff barrier (NTB) index in the latter case. This suggests that the time costs involved with importing do not act as significant barriers to trade in the SADC case. Otherwise, only slight discrepancies are evident between the 2 models, which gives considerable weight to the results. The implication is that moving forward to the goal of currency regionalism in the SADC, the corresponding harmonisation and relaxation of the controls on foreign exchange transactions will likely have an encouraging effect on trade, specifically imports, to the region.

In this way, the liberalisation of these controls should reduce constraints to the implementation of the established FTA between SADC countries. As such, exchange controls should not be excluded from the list of empirically tested NTBs in the region, as has hitherto been the case. Though these results are informative, it is not easy to isolate the impact of exchange controls on trade when other non-economic factors such as political instability and regulatory quality are distorting the relationship (Ellyne and Letete, 2012). To this end, it is recommended that further research should test the robustness of the SADC trade effect of exchange control restrictiveness when relevant institutional factors are taken into account.

With regard to the construction of the exchange control restrictiveness index (ECRI), the paper provides an accessible and transparent measure the restrictiveness of exchange controls that is consistent across SADC member states. As such, it provides a useful tool in furthering research related to the dynamics of exchange controls with other economic factors for example the effect of the ECRI on FDI flows specific to the SADC region. Such research can inform the feasibility and consequences of the move to establish a regional monetary union in 2018, which constitutes an important part of the continent-wide integration goals.

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A Index Construction

Table 6: Number of Restrictions

0	No restrictions	Totally liberalised/open
2	Low restrictiveness	Reporting required or issue of timing
4	Medium restrictiveness	Permission or high level of reporting required, significant timing restriction, license
6	High restrictiveness	Quantity restriction, but limits may not be very binding
8	Maximum restrictiveness	Binding quantity restriction or total prohibition

Note: A higher value captures increasing exchange control restrictiveness.

The index indicates the percentage of total possible restrictiveness that a country's de jure policies suggests. In principle, scores may range from 0 to 100. The sub-index percentages are calculated by dividing the sum of the scores assigned to each individual restriction in the category by the total possible sum that could have been awarded (number of restrictions multiplied by 8):

$$\text{Sub-index} = \frac{\text{sum of field scores}}{8 \times \text{number of fields}} \times 100$$

The overall index score for a country is then calculated as the aggregation of the sub-indices:

$$\text{ECRI} = \frac{\text{sum of all scores}}{8 \times \text{number of all field categories}} \times 100$$

For all scores, the index indicates the percentage of total possible restrictiveness that a country policy suggests.

B Examples of AREAR Line Items

Figure 4: Goods, Services and Financial ECRI AREAR Line Items

Goods ECRI	Services ECRI	Financial Sector ECRI
VII. Imports and Import Payments	IX. Payments for Invisible Transactions and Current Transfers	XII. Provisions Specific to the Financial Sector
A. Foreign exchange budget	A. Controls on these transfers	A. Provisions specific to commercial banks and other credit institutions
B. Financing requirements for imports	1. Trade-related service payments	1. Borrowing abroad
1. Minimum financing requirements	a. Prior approval	2. Maintenance of accounts abroad
2. Advance payment requirements	b. Quantitative limits	3. Lending to nonresidents (financial or commercial credits)
3. Advance import deposits	c. Indicative limits/bona fide test	4. Lending locally in foreign exchange
C. Documentation requirements for release of foreign exchange for imports	2. Investment-related payments	5. Purchase of locally issued securities denominated in foreign exchange
1. Domiciliation requirements	a. Prior approval	6. Differential treatment of deposit accounts in foreign exchange
2. Preshipment inspection	b. Quantitative limits	a. Reserve requirements
3. Letters of credit	c. Indicative limits/bona fide test	b. Liquid asset requirements
4. Import licenses used as exchange licenses	3. Payments for travel	c. Interest rate controls
5. Other	a. Prior approval	d. Credit controls
D. Import licenses and other nontariff measures	b. Quantitative limits	7. Differential treatment of deposit accounts held by nonresidents
1. Positive list	c. Indicative limits/bona fide test	a. Reserve requirements
2. Negative list	4. Personal payments	b. Liquid asset requirements
3. Open general licenses	a. Prior approval	c. Interest rate controls
4. Licenses with quotas	b. Quantitative limits	d. Credit controls
5. Other nontariff measures	c. Indicative limits/bona fide test	8. Investment regulations
E. Import taxes and/or tariffs	5. Foreign workers' wages	a. Abroad by banks
1. Taxes collected through the exchange system	a. Prior approval	b. In banks by nonresidents
F. State import monopoly	b. Quantitative limits	9. Open foreign exchange position limits
G. References to legal instruments and hyperlinks	c. Indicative limits/bona fide test	a. On resident assets and liabilities
VIII. Exports and Export Proceeds	6. Credit card use abroad	b. On nonresident assets and liabilities
A. Repatriation requirements	a. Prior approval	B. Provisions specific to institutional investors
1. Surrender requirements	b. Quantitative limits	1. Insurance companies
a. Surrender to the central bank	c. Indicative limits/bona fide test	a. Limits (max.) on securities issued by nonresidents
b. Surrender to authorized dealers	7. Other payments	b. Limits (max.) on investment portfolio held abroad
B. Financing requirements	a. Prior approval	c. Limits (min.) on investment portfolio held locally
C. Documentation requirements	b. Quantitative limits	d. Currency-matching regulations on assets/liabilities composition
1. Letters of credit	c. Indicative limits/bona fide test	2. Pension funds
2. Guarantees	B. References to legal instruments and hyperlinks	a. Limits (max.) on securities issued by nonresidents
3. Domiciliation	X. Proceeds from Invisible Transactions and Current Transfers	b. Limits (max.) on investment portfolio held abroad
4. Preshipment inspection	A. Repatriation requirements	c. Limits (min.) on investment portfolio held locally
5. Other	1. Surrender requirements	d. Currency-matching regulations on assets/liabilities composition
D. Export licenses	a. Surrender to the central bank	3. Investment firms and collective investment funds
1. Without quotas	b. Surrender to authorized dealers	
2. With quotas	B. Restrictions on use of funds	
E. Export taxes	C. References to legal instruments and hyperlinks	
1. Collected through the exchange system		
2. Other export taxes		
F. References to legal instruments and hyperlinks		

Figure 5: AREAR Line Items for ECRI on Capital Account and Applying to all AREAR Line Items

Capital ECRI	ECRI applying to all
XI. Capital Transactions	III. Exchange Arrangement
A. Controls on capital transactions	A. Currency
1. Repatriation requirements	1. Other legal tender
a. Surrender requirements	B. Exchange rate structure
1. Surrender to the central bank	1. Unitary
2. Surrender to authorized dealers	2. Dual
2. Controls on capital & money market instruments	3. Multiple
a. On capital market securities	C. Classification
1. Shares or other securities of a participating nature	1. No separate legal tender
i. Purchase locally by nonresidents	2. Currency board
ii. Sale or issue locally by nonresidents	3. Conventional peg
iii. Purchase abroad by residents	4. Stabilized arrangement
iv. Sale or issue abroad by residents	5. Crawling peg
2. Bonds or other debt securities	6. Crawl-like arrangement
i. Purchase locally by nonresidents	7. Pegged exchange rate within horizontal bands
ii. Sale or issue locally by nonresidents	8. Other managed arrangement
iii. Purchase abroad by residents	9. Floating
iv. Sale or issue abroad by residents	10. Free floating b.
On money market instruments	D. Exchange tax
1. Purchase locally by nonresidents	E. Exchange subsidy
2. Sale or issue locally by nonresidents	F. Foreign exchange market
3. Purchase abroad by residents	1. Spot exchange market
4. Sale or issue abroad by residents	a. Operated by the central bank
c. On collective investment securities	1. Allocation
1. Purchase locally by nonresidents	2. Auction
2. Sale or issue locally by nonresidents	3. Fixing
3. Purchase abroad by residents	b. Interbank market
4. Sale or issue abroad by residents	2. Forward exchange market
3. Controls on derivatives and other instruments	a. Official cover of forward operations
a. Purchase locally by nonresidents	I. References to legal instruments and hyperlinks
b. Sale or issue locally by nonresidents	
c. Purchase abroad by residents	IV. Arrangements for Payments and Receipts
d. Sale or issue abroad by residents	A. Prescription of currency requirements
4. Controls on credit operations	1. Controls on the use of domestic currency
a. Commercial credits	a. For current transactions and payments
1. By residents to nonresidents	b. For capital transactions
2. To residents from nonresidents	1. Transactions in capital and money market instruments

Figure 6: AREAR Line Items for Capital ECRI and ECRI Applying to all continued...

<ul style="list-style-type: none"> b. Financial credits <ul style="list-style-type: none"> 1. By residents to nonresidents 2. To residents from nonresidents c. Guarantees, sureties, and financial backup facilities <ul style="list-style-type: none"> 1. By residents to nonresidents 2. To residents from nonresidents 5. Controls on direct investment <ul style="list-style-type: none"> a. Outward direct investment b. Inward direct investment 6. Controls on liquidation of direct investment 7. Controls on real estate transactions <ul style="list-style-type: none"> a. Purchase abroad by residents b. Purchase locally by nonresidents c. Sale locally by nonresidents 8. Controls on personal capital transactions <ul style="list-style-type: none"> a. Loans <ul style="list-style-type: none"> 1. By residents to nonresidents 2. To residents from nonresidents b. Gifts, endowments, inheritances, and legacies <ul style="list-style-type: none"> 1. By residents to nonresidents 2. To residents from nonresidents c. Settlement of debts abroad by immigrants d. Transfer of assets <ul style="list-style-type: none"> 1. Transfer abroad by emigrants 2. Transfer into the country by immigrants e. Transfer of gambling and prize earnings B. References to legal instruments and hyperlinks 	<ul style="list-style-type: none"> 2. Transactions in derivatives and other instruments 3. Credit operations 2. Controls on Use of foreign exchange among residents B. Payments arrangements <ul style="list-style-type: none"> 1. Bilateral payments arrangements <ul style="list-style-type: none"> a. Operative b. Inoperative 2. Regional arrangements 3. Clearing agreements 4. Barter agreements and open accounts C. Administration of control D. Payments arrears <ul style="list-style-type: none"> 1. Official 2. Private E. Controls on trade in gold (coins and/or bullion) <ul style="list-style-type: none"> 1. On domestic ownership and/or trade 2. On external trade F. Controls on exports and imports of banknotes <ul style="list-style-type: none"> 1. On exports <ul style="list-style-type: none"> a. Domestic currency b. Foreign currency 2. On imports <ul style="list-style-type: none"> a. Domestic currency b. Foreign currency G. References to legal instruments and hyperlinks
	V. Resident Accounts
	<ul style="list-style-type: none"> A. Foreign exchange accounts permitted <ul style="list-style-type: none"> 1. Held domestically <ul style="list-style-type: none"> a. Approval required 2. Held abroad <ul style="list-style-type: none"> a. Approval required B. Accounts in domestic currency held abroad C. Accounts in domestic currency convertible into foreign currency D. References to legal instruments and hyperlinks
	VI. Nonresident Accounts
	<ul style="list-style-type: none"> A. Foreign exchange accounts permitted <ul style="list-style-type: none"> 1. Approval required B. Domestic currency accounts <ul style="list-style-type: none"> 1. Convertible into foreign currency 2. Approval required C. Blocked accounts

C Index Analysis

Figure 7: SADC Overall Exchange Control Indices for 2005 vs. 2010

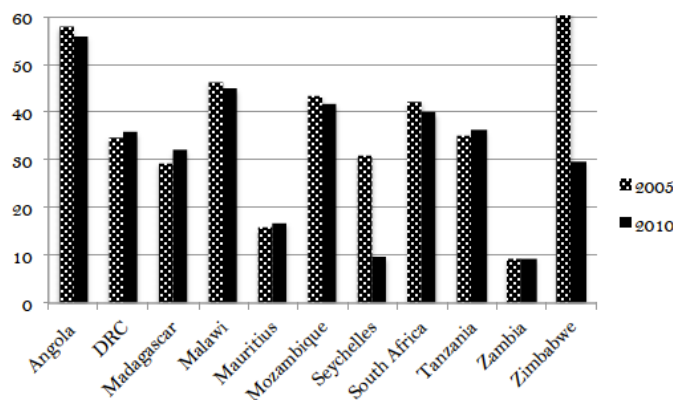


Table 7: Cross-correlations of indices

Control Index	Overall	Goods	Services	Capital	Financial account	Applying to all
Overall	1.000					
Goods	0.870	1.000				
Services	0.937	0.835	1.000			
Capital	0.863	0.646	0.712	1.000		
Financial account	0.888	0.793	0.866	0.726	1.000	
Applying to all	0.903	0.741	0.791	0.727	0.675	1.000

Figure 8: Disaggregated SADC ECRIs for 2010

Country	Goods	Services	Capital Account	Financial Sector	Applying to all	Overall	Rank
Angola DRC	47,9	69,4	61,4	41,7	57,7	56,0	1
Madagascar	41,7	27,5	48,2	41,7	26,9	35,7	6
Malawi	20,8	11,1	44,6	45,0	35,0	31,9	7
Mauritius	39,6	60,0	53,6	41,7	38,0	44,9	2
Mozambique	22,9	0,0	33,9	18,8	10,0	16,8	9
Seychelles	33,3	50,0	46,4	54,2	34,3	41,7	3
South Africa	14,6	0,0	7,1	12,5	11,1	9,7	10
Tanzania	39,6	55,0	55,4	52,1	20,2	39,9	4
Zambia	31,8	17,5	53,6	45,5	31,7	36,1	5
Zimbabwe	16,7	0,0	3,6	8,3	13,0	9,3	11
	20,8	10,0	57,1	27,1	27,9	29,7	8

Table 8: Changes in ECRI over time

2000 - 2005		2005 - 2010		2000 - 2010	
-	+	-	+	-	+
Angola	Madagascar	Angola	DRC	Angola	Madagascar
DRC	Malawi	Malawi	Madagascar	DRC	Mauritius
South Africa	Mozambique	Mozambique	Mauritius	Malawi	Mozambique
	Mauritius	Seychelles	Tanzania	Seychelles	Tanzania
	Mozambique	South Africa	Zambia	South Africa	Zambia
	Seychelles	Zimbabwe		Zimbabwe	
	Tanzania				
	Zambia				
	Zimbabwe				

Figure 9: SADC ECRIs from 2000 to 2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Angola	58,1	62,7	61,5	60,9	59,6	57,8	59,0	...	58,3	...	56,0
DRC	41,3	39,0	39,2	37,1	34,6	34,6	34,3	34,4	35,8	36,8	35,7
Madagascar	28,0	29,0	29,4	29,0	28,9	29,4	27,7	25,9	28,8	30,4	31,9
Malawi	45,2	47,5	46,2	45,8	45,8	46,3	45,9	43,3	45,3	44,9	44,9
Mauritius	13,5	16,0	16,0	14,6	14,6	15,8	15,8	15,1	15,1	18,2	16,8
Mozambique	38,8	40,2	40,7	40,7	40,7	43,4	44,7	44,9	41,9	42,3	41,7
Seychelles	22,2	25,8	25,8	25,8	33,5	30,9	25,4	25,4	15,3	9,7	9,7
South Africa	44,0	43,5	39,9	43,8	41,7	42,1	41,4	43,8	43,2	41,9	39,9
Tanzania	32,1	32,1	33,2	33,7	33,7	35,2	34,4	35,3	35,3	37,3	36,1
Zambia	8,6	7,1	7,4	7,0	7,4	9,1	8,7	9,3	10,6	9,7	9,3
Zimbabwe	56,3	59,6	60,4	61,8	62,9	61,4	63,0	62,7	51,7	50,3	29,7

D Disaggregated ECRI summary statistics

Figure 10: Angola ECRI Summary Statistics

	Goods	Services	Capital Account	Financial Sector	Applies to all	Overall
Mean	50,3	66,0	67,9	61,3	56,4	59,3
Median	50,0	65,0	70,5	61,1	56,5	59,0
Std. Dev.	2,6	1,9	4,8	13,2	1,8	2,1
Min	47,9	63,9	58,3	41,7	53,9	56,0
Max	54,5	69,4	72,7	78,1	59,6	62,7

Figure 11: DRC ECRI Summary Statistics

	Goods	Services	Capital Account	Financial Sector	Applies to all	Overall
Mean	41,1	35,9	44,7	43,0	27,3	36,6
Median	37,5	30,0	51,8	41,7	26,9	35,8
Std. Dev.	7,2	9,8	11,3	3,4	5,8	2,3
Min	35,4	27,5	29,2	39,6	20,8	34,3
Max	54,5	50,0	54,2	50,0	38,2	41,3

Figure 12: Madagascar ECRI Summary Statistics

	Goods	Services	Capital Account	Financial Sector	Applies to all	Overall
Mean	21,4	11,1	46,8	17,6	34,0	28,9
Median	20,8	11,1	50,0	16,7	35,0	29,0
Std. Dev.	1,9	0,0	4,9	19,6	3,9	1,5
Min	20,8	11,1	38,9	0,0	26,3	25,9
Max	27,1	11,1	53,6	45,0	38,1	31,9

Figure 13: Malawi ECRI Summary Statistics

	Goods	Services	Capital Account	Financial Sector	Applies to all	Overall
Mean	40,0	59,7	47,8	45,8	41,2	45,6
Median	39,6	60,0	45,8	50,0	41,3	45,8
Std. Dev.	2,0	3,6	4,1	5,9	2,7	1,1
Min	37,5	55,0	43,8	37,5	35,5	43,3
Max	43,8	68,8	53,6	50,0	44,8	47,5

Figure 14: Mauritius ECRI Summary Statistics

	Goods	Services	Capital Account	Financial Sector	Applies to all	Overall
Mean	25,9	0,0	19,3	14,5	15,8	15,6
Median	25,0	0,0	16,7	15,0	16,3	15,8
Std. Dev.	3,9	0,0	7,0	3,4	2,6	1,3
Min	22,7	0,0	12,5	10,4	10,0	13,5
Max	31,8	0,0	33,9	18,8	18,5	18,2

Figure 15: Mozambique ECRI Summary Statistics

	Goods	Services	Capital Account	Financial Sector	Applies to all	Overall
Mean	30,5	58,4	50,6	48,5	33,0	41,8
Median	29,2	55,0	54,2	47,2	33,0	41,7
Std. Dev.	2,8	9,3	4,0	3,4	4,3	1,9
Min	27,1	50,0	46,4	45,8	23,8	38,8
Max	35,4	72,5	54,2	55,0	38,9	44,9

Figure 16: Seychelles ECRI Summary Statistics

	Goods	Services	Capital Account	Financial Sector	Applies to all	Overall
Mean	28,4	18,6	17,1	15,0	27,6	22,7
Median	33,3	25,0	16,7	15,0	31,8	25,4
Std. Dev.	9,2	12,2	14,4	2,0	8,6	7,9
Min	14,6	0,0	5,4	12,5	11,1	9,7
Max	39,6	32,5	58,3	18,8	37,5	33,5

Figure 17: South Africa ECRI Summary Statistics

	Goods	Services	Capital Account	Financial Sector	Applies to all	Overall
Mean	41,1	53,9	52,2	52,6	27,8	42,3
Median	39,6	52,5	50,0	52,1	28,1	42,1
Std. Dev.	1,9	4,9	3,0	2,8	4,7	1,5
Min	39,6	47,5	47,9	47,9	20,2	39,9
Max	43,8	62,5	55,4	57,5	34,8	44,0

Figure 18: Tanzania ECRI Summary Statistics

	Goods	Services	Capital Account	Financial Sector	Applies to all	Overall
Mean	32,8	24,5	52,7	33,6	30,3	34,4
Median	32,5	25,0	53,6	35,0	29,3	34,4
Std. Dev.	2,4	3,7	5,2	10,1	1,3	1,6
Min	29,5	17,5	39,3	20,5	29,0	32,1
Max	35,0	27,5	56,3	52,3	32,3	37,3

Figure 19: Zambia ECRI Summary Statistics

	Goods	Services	Capital Account	Financial Sector	Applies to all	Overall
Mean	15,7	0,0	3,9	9,8	10,5	8,6
Median	14,6	0,0	4,2	8,3	12,0	8,7
Std. Dev.	1,4	0,0	0,3	3,0	2,9	1,2
Min	14,6	0,0	3,6	8,3	6,8	7,0
Max	18,8	0,0	4,2	18,2	13,5	10,6

Figure 20: Zimbabwe ECRI Summary Statistics

	Goods	Services	Capital Account	Financial Sector	Applies to all	Overall
Mean	46,0	72,5	58,5	61,9	50,5	56,3
Median	52,1	85,0	57,1	63,9	53,7	60,4
Std. Dev.	11,0	24,4	3,4	13,0	9,2	9,9
Min	20,8	10,0	56,3	27,1	27,9	29,7
Max	52,1	90,0	64,3	70,8	58,3	63,0

E Data

Figure 21: List of Exporters

Argentina	Hong Kong	Malaysia	Switzerland
Australia	India	Mauritius	Singapore
Brazil	Indonesia	Mexico	South Africa
China	Israel	Mozambique	Sweden
Cote d'Ivoire	Italy	Nigeria	Tanzania
DRC	Japan	Norway	Thailand
Finland	Kenya	Philippines	United Kingdom
France	Madagascar	Russia	United States
Germany	Malawi	Seychelles	Zambia
			Zimbabwe

F Further Empirical Results

Table 9: Disaggregated Indices using OLS

	(1)	(2)	(3)	(4)	(5)
Log GDP SADC	0.901*** (0.187)	1.011*** (0.182)	0.832*** (0.182)	0.864*** (0.183)	0.819*** (0.156)
Log GDP exporter	0.993*** (0.326)	0.995*** (0.327)	0.997*** (0.327)	1.000*** (0.327)	0.985*** (0.326)
Log distance	-0.871*** (0.193)	-0.871*** (0.193)	-0.871*** (0.193)	-0.871*** (0.193)	-0.871*** (0.193)
Common border	0.644*** (0.149)	0.644*** (0.149)	0.645*** (0.150)	0.645*** (0.149)	0.643*** (0.149)
Common language	0.428*** (0.0782)	0.428*** (0.0782)	0.428*** (0.0782)	0.428*** (0.0782)	0.429*** (0.0782)
Tariff index	-0.0565*** (0.0190)	-0.0520*** (0.0184)	-0.0531** (0.0204)	-0.0618*** (0.0194)	-0.0499*** (0.0176)
NTB index	-0.0784*** (0.0274)	-0.0873*** (0.0280)	-0.0838*** (0.0274)	-0.0684** (0.0307)	-0.0924*** (0.0279)
Goods ECRI	-0.00446 (0.00359)				
Services ECRI		-0.00475*** (0.00135)			
Capital ECRI			-0.00323 (0.00246)		
Financial ECRI				-0.00133 (0.00193)	
ECRI applying to all					-0.00862** (0.00344)
Observations	3144	3144	3144	3144	3144
Adjusted R ²	0.594	0.594	0.594	0.594	0.594

The dependent variable takes the form $\log(1+imports)$. Robust standard-errors in parentheses are clustered by importer overtime. Importer, exporter and year fixed effects are applied.
 * p < 0.10, ** p < 0.05, *** p < 0.01

Table 10: Disaggregated Indices using PPML

	(1)	(2)	(3)	(4)	(5)
Log GDP SADC	1.022*** (0.184)	1.087*** (0.163)	0.755*** (0.203)	0.795*** (0.172)	0.778*** (0.175)
Log GDP exporter	2.052*** (0.210)	2.047*** (0.209)	2.037*** (0.213)	2.041*** (0.208)	2.038*** (0.213)
Log distance	-0.969*** (0.273)	-0.968*** (0.274)	-0.971*** (0.274)	-0.971*** (0.274)	-0.970*** (0.274)
Common border	0.796*** (0.239)	0.794*** (0.239)	0.793*** (0.240)	0.793*** (0.240)	0.795*** (0.240)
Common language	0.725*** (0.138)	0.722*** (0.137)	0.724*** (0.138)	0.724*** (0.138)	0.725*** (0.138)
Tariff index	-0.133*** (0.0296)	-0.122*** (0.0248)	-0.140*** (0.0301)	-0.142*** (0.0288)	-0.141*** (0.0298)
NTB index	-0.0281 (0.0354)	-0.0499 (0.0312)	-0.0259 (0.0353)	-0.0191 (0.0425)	-0.0248 (0.0360)
Goods ECRI	-0.0137** (0.00590)				
Services ECRI		-0.00906*** (0.00152)			
Capital ECRI			-0.00117 (0.00610)		
Financial ECRI				-0.00177 (0.00546)	
ECRI applying to all					-0.00385 (0.00582)
Observations	3144	3144	3144	3144	3144
Adjusted R ²	0.955	0.956	0.954	0.955	0.954

The dependent variable is *imports* measured in levels. Robust standard-errors in parentheses are clustered by importer over time. Importer, exporter and year fixed effects are applied. * p < 0.10, ** p < 0.05, *** p < 0.01

Table 11: Comparing CI Index and Capital ECRI across Both Models

	(1)	(2)	(3)	(4)
	OLS	PPML	OLS	PPML
Log GDP SADC	0.832*** (0.182)	0.755*** (0.203)	0.814*** (0.182)	0.778*** (0.201)
Log GDP exporter	0.997*** (0.327)	2.037*** (0.213)	1.178*** (0.349)	2.099*** (0.203)
Log distance	-0.871*** (0.193)	-0.971*** (0.274)	-1.444*** (0.139)	-1.259*** (0.283)
Common border	0.645*** (0.150)	0.793*** (0.240)	0.518*** (0.164)	1.003*** (0.231)
Common language	0.428*** (0.0782)	0.724*** (0.138)	0.224*** (0.0836)	0.911*** (0.155)
Tariff index	-0.0531** (0.0204)	-0.140*** (0.0301)	-0.0588*** (0.0194)	-0.144*** (0.0294)
NTB index	-0.0838*** (0.0274)	-0.0259 (0.0353)	-0.0811*** (0.0264)	-0.0357 (0.0371)
Controls on capital	-0.00323 (0.00246)	-0.00117 (0.00610)		
Chinn-Ito index			-0.0229 (0.0346)	0.0215 (0.0539)
Observations	3144	3144	2955	2955
Adjusted R ²	0.594	0.954	0.653	0.959

The dependent variable takes the form of $\log(1 + imports)$ in models (1) and (3) and level $imports$ for (2) and (4). Robust standard-errors in parentheses are clustered by importer over time. Importer, exporter and year fixed effects are applied. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 12: SADC RTA over Both Models

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	PPML	OLS	PPML	OLS	PPML
Log GDP SADC	0.900*** (0.154)	1.000*** (0.156)	0.939*** (0.176)	0.975*** (0.165)	0.952*** (0.178)	0.820*** (0.182)
Log GDP exporter	0.902*** (0.288)	2.043*** (0.205)	0.986*** (0.327)	2.051*** (0.210)	0.807*** (0.271)	2.561*** (0.376)
Log distance	-0.836*** (0.182)	-0.993*** (0.259)	-0.871*** (0.193)	-0.970*** (0.274)	-0.921*** (0.203)	-1.051*** (0.268)
Common border	0.618*** (0.139)	0.763*** (0.229)	0.644*** (0.149)	0.795*** (0.239)	0.663*** (0.152)	0.719*** (0.227)
Common language	0.418*** (0.0736)	0.739*** (0.135)	0.428*** (0.0782)	0.724*** (0.138)	0.416*** (0.0840)	0.672*** (0.124)
Tariff index	-0.0699*** (0.0190)	-0.129*** (0.0236)	-0.0488*** (0.0179)	-0.123*** (0.0277)	-0.0465*** (0.0173)	-0.123*** (0.0278)
NTB index			-0.0830*** (0.0277)	-0.0343 (0.0336)	-0.0783*** (0.0272)	0.00352 (0.0382)
SADC RTA					15.20 (14.05)	7.184 (8.391)
ECRI	-0.00802*** (0.00303)	-0.0164*** (0.00482)	-0.0101*** (0.00291)	-0.0168*** (0.00469)	-0.00912*** (0.00296)	-0.0123*** (0.00477)
Observations	3434	3434	3144	3144	3048	3048
Adjusted R ²	0.592	0.952	0.594	0.955	0.594	0.949

The dependent variable takes the form of $\log(1 + imports)$ in models (1), (3) and (5) and is level *imports* for (2), (4) and (6). Robust standard-errors in parentheses are clustered by importer over time. Importer, exporter and year fixed effects are applied. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 13: Interaction between ECRI and Corruption Measure

	(1) OLS	(2) PPML
Log GDP SADC	0.966*** (0.207)	0.897*** (0.248)
Log GDP exporter	1.016*** (0.352)	2.034*** (0.223)
Log distance	-0.857*** (0.197)	-0.949*** (0.276)
Common border	0.651*** (0.154)	0.802*** (0.244)
Common language	0.423*** (0.0782)	0.718*** (0.139)
Tariff index	-0.0602*** (0.0181)	-0.130*** (0.0272)
NTB index	-0.0654** (0.0290)	-0.0494 (0.0367)
Corruption	-0.0806 (0.196)	-0.192 (0.236)
Corruption*ECRI	0.00307 (0.00380)	0.00770 (0.00612)
ECRI	-0.00622 (0.00501)	-0.00488 (0.0104)
Observations	3029	3029
Adjusted R ²	0.588	0.955

The dependent variable takes the form of $\log(1 + imports)$ in model (1) and level *imports* for (2). Robust standard-errors in parentheses are clustered by importer over time. Importer, exporter and year fixed effects are applied. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$