TRADE & INDUSTRIAL POLICY STRATEGIES

CROSS-CUTTING LOGISTICS ISSUES UNDERMINING REGIONAL INTEGRATION ACROSS SADC

Sandy Lowitt

December 2017

Trade & Industrial Policy Strategies (TIPS) is a research organisation that facilitates policy development and dialogue across three focus areas: trade and industrial policy, inequality and economic inclusion, and sustainable growth

Sandy Lowitt
is a TIPS
Research Fellow

info@tips.org.za
+27 12 433 9340
www.tips.org.za

CONTENTS

ABBREVIATIONS

AEO	Authorised Economic Operator
CBRTA	Cross Border Road Transport Agency
CCRED	Centre for Competition, Regulation and Economic Development
COMESA	Common Market for Eastern and Southern Africa
ECA	East African Community
ETI	Enabling Trade Index
EU	European Union
GDP	Gross Domestic Product
ICT	Information and Communications Technology
LPI	Logistics Performance Indicator
NTBs	Non-Tariff Barriers
SADC	Southern African Development Community
SPS	Sanitary and Phytosanitary Standards

1. INTRODUCTION

The logistics industry is about planning, implementing and controlling the efficient, cost-effective flow and storage of raw materials, in-process inventory, finished goods and related information from point of origin to point of consumption. Logistics performance is thus generally rated and assessed in terms of the quality of infrastructure, the competence of private and public logistics service providers, the efficiency and effectiveness of customs and border agencies, corruption and transparency, and the reliability and predictability of trading systems and supply chains (World Bank 2007). Better logistics performance is strongly associated with trade expansion, export diversification, ability to attract foreign direct investment and growth. Trade logistics matter. Although the logistics industry includes a large, dynamic private sector component – it must be appreciated that cross border logistics is a crucial sub set of trade facilitation, which is a pivotal public good as a key business environment enabler and core activity underpinning regional and global trade.

Logistics in developed nations is not limited to transportation and trade facilitation but includes a rapidly evolving agenda focused on increased client service offerings, development of smarter facilities (warehousing and distribution centres), new delivery mechanisms (drones), and new cutting-edge infrastructure and spatial planning (hub and spoke break bulk facilities in special economic zones). Amazon, the on-line retail store, for example, no longer considers its market differentiator to be its e-commerce platform but rather its logistics and distribution services (Dacher 2015). In developing countries, however, the logistics agenda remains dominated by the most basic transport and trade facilitation issues – with even basic value-added services such as track and trace and digitised warehousing failing to make it onto the list of constraints facing regional importers and exporters. This appears to be the case in most Southern African Development Community (SADC) Member States except South Africa.

Sub Saharan Africa ranks as the overall worst performing region globally according to the World Bank's Logistics Performance Indicator (LPI). In the six sub categories of customs, infrastructure, international shipments, logistics competence, tracking and tracing, and timeliness the region achieves the lowest global scores in every category by some margin. Transport and logistics performance is so poor that, when all border crossing and transit delays are taken into account, the average speed of a truck traversing the North South Corridor (South Africa to Zambia) is calculated to be just six kilometres an hour – a speed lower than a horse and carriage. The equivalent rail speed is calculated at four kilometres an hour (UKAid, 2014). In addition, transport costs in the region are high (Teravaninthorn and Raballand, 2009), transport prices are high and often uncompetitive (Vilakazi and Paelo 2017), and firms face high induced costs due to the need to hold substantial inventories in the face of unpredictable delivery schedules (World Bank). This poor and expensive performance undermines company level competitiveness, regional trade, and access to opportunities to diversify into higher value-added production and global value chains. It is often said that a chain is as strong as its weakest link. In Sub Saharan Africa intra-regional value chain growth and development is, and will continue to be, constrained by the weakest link in the chain – transport and logistics. As transport and logistics is a cross-cutting issue which impacts all value chains in all sectors it is a topic which requires the utmost attention from a regional growth perspective.

Unfortunately, what emerges from the research is that the issues characterising the region's poor transport and logistics performance are well documented and have been well known for some time. This has resulted in numerous detailed plans, strategies, policies, instruments, interventions and protocols being developed throughout SADC, the Common Market for Eastern and Southern Africa (COMESA), the Tripartite Community – comprising COMESA, the East African Community (ECA) and SADC – and Member States. However, as argued by Hartzenberg and Katenga (2015), while trade liberalisation in SADC has been largely successful and made substantial progress, it has not been matched by a reduction in non-tariff barriers (NTBs). Indeed, it appears from this research that SADC Member States are likely using logistics and transport issues, especially those at border posts and related to customs, as non-tariff barriers to protect local markets. While these NTBs are visible and in effect throughout SADC, they are particularly noticeable with South Africa, and can be seen as a device to counter South Africa's perceived mercantilist expansion into the region (Roberts, 2017). The lack of political will to implement SADC protocols and plans related to transport and logistics, and no meaningful desire on the part of Member States to dismantle these NTBs – the options for dealing with the transport and logistics agenda and improving performance and reducing costs looks challenging at best and elusive at worst.

This paper follows the highly informative work of Vilakazi and Paelo (2017) on intra-regional transport. While attempts were made to broaden the research parameters to include all modes of transport and particularly intermodal issues, the fact that 80% of intra-SADC trade uses roads and trucks meant that literature reviews and interviews to identify cross-cutting issues continuously returned to roads, commercial inland border posts and issues related to road haulage. In addition, all the value chain reports completed to date within the Regional Value Chain Project[1] report on transport and logistics constraints related to road transport specifically[2]. The identification of road transport as the key form of transport and important contributor to the competitiveness of value chains such as the fertiliser, poultry, soya and agricultural inputs was an important determining factor in the focus of the research. The importance attached, and the reason to focus exclusively[3] on road transport and logistics arises in light of the forthcoming work of Hartzenberg (2017) and the work of Arndt and Roberts (2017). This suggests that future progress in several SADC areas may lie not in the linear integration approach currently adopted by SADC and based on a governance model which transcends member states sovereignty, but in the new discourse which considers the avoidance of supranational institutions and focuses more on a bottom-up approach. This paper does not go so far as to suggest that solutions to transport and logistics issues in SADC can be dealt with in a bottom-up manner, but it does not exclude the possibility given the demonstrable lack of political will to deal with the issues from the top.

The paper begins with a broad contextual overview of SADC's transport and logistics performance in terms of the Logistics Performance Index and tracks the performance of individual member states in the decade from 2007. Two interesting findings emerge in Section 2. First that the better performing SADC member states have been improving their logistics performance over time while the worst

[1] For more about this project and copies of the research go to www.competition.org.za/regional-value-chains/
[2] One exception is the fertiliser value chain where dwell times at sea ports is raised as an issue.
[3] Vilakazi and Paelo (2017) argue that road transportation in SADC has increased in importance as rail networks in several Member States has declined due to low maintenance investment.

performing states have seen their performance decrease and deteriorate since 2007. The second interesting (and controversial) finding is that improved logistics service and operations is viewed as more important than additional investments in infrastructure in the region.

Section 3 identifies the cross-cutting logistics issues collated from a literature review, a small sample of interviews with logistics firms operating in the region, completed value chain reports, SADC documentation, and finally the tradebarriers.org website, a Tripartite Community initiative to report, monitor and eliminate NTB complaints. As will be shown, 78% of all received complaints are directly related to logistics issues. The section confirms that issues on the ground are understood and captured in the compendium of work available to decision-makers at a member state and community level. There appears to be no asymmetry of information or lack of appreciation of what is required. This is borne out by Section 4, which provides a brief consideration of the underlying difficulties for member states to make logistics improvements and a brief overview of the SADC logistics agenda and action plans. SADC's multiple activities related to logistics, transport and trade facilitation confirm that no asymmetry of information exists between what needs to be addressed and plans for addressing these, although there is space to reconsider implementation priorities. This view is supported in a 2013 African Development Bank analysis.

In an attempt to be useful to policy thinkers, Section 5 concludes by suggesting some ideas connected to making existing policy initiatives more effective (e.g. expanding the constituency of stakeholders and bundling initiatives to achieve synergy); a few more abstract ideas regarding how changing the discourse, language and positioning of the logistics issue may yield some renewed impetus in an otherwise moribund area of regional integration; and finally, specific and practical simple interventions which would constitute quick wins and be uncontroversial.

2. SADC TRANSPORT AND LOGISTICS PERFORMANCE

There is a well-established link between trade and economic development (World Bank 2007). SADC Member States are committed to increasing the volume and value of intra-regional trade as one of the pillars for growing the community and its member states. At present intra-regional SADC trade accounts for only 13% to 15% of total SADC trade. This is low compared to 40% in North America and 60% across the European Union (EU). One of the key impediments to improved and increased intra-regional trade is the prohibitively high cost of transport (Teravaninthorn and Raballand (2009); Vilikazi and Paelo 2017; CBRTA 2015, 2016; World Bank 2007, 2012, 2016; Havenga 2011), which Mac Kellar et al (2002) argues is three to four times greater in landlocked Southern African countries than developed countries. Teravaninthorn and Raballand (2009) comparing transport costs in seven African countries and seven equivalent South-East Asian countries find that per unit costs for road transport in Africa is 40% to 100% more expensive than in equivalent South-East Asian costs; while Vilakazi and Paelo (2017) show that road haulage costs from Zambia to South Africa are double the cost they could be, and that cutting transport prices by half would improve regional cost competitiveness by 10%. Limoa and Venables (2008) calculate that a 10% decrease in transport costs leads to a 25% increase in trade.

Looking more specifically at the role of logistics and the competitiveness of trade, Korinek and Sourdin (2011) using the World Economic Forum's Enabling Trade Index (ETI) and the World Bank's LPI find that a 10% improvement in a country's ETI and LPI is associated with, on average, a 19% increase in trade for imports and 36% for exports. Wilson, Mann and Otsuki (2003) in a study of Asia-Pacific Economic Cooperation (APEC) members, conclude that if members with below average scores on the LPI improve performance halfway to the average for all members, intra-APEC trade flows could grow by 21%, which would result in a 4.3% increase in average APEC per capita GDP. At an even more disaggregated level, Teravaninthorn and Raballand (2009) show that rehabilitating the condition of a road from fair to good along an individual transport corridor will decrease transport prices in Africa by 2% to 3% while a 20% reduction in time delays at border posts will decrease transport prices by 10% to 15% on average. Indeed, of all the potential strategies considered by Teravaninthorn and Raballand to decrease transport prices in Africa (including reductions in the price of fuel and decreases in bribery), decreasing logistics inefficiencies provided the single biggest impact.

Measuring logistics performance

Comparative data on SADC logistics performance is hard to find at a Member State level. The most expansive and comparable data set available is the World Bank's LPI, which is based on a survey of industry players[4]. Global industry players' survey results are used to compile the overall index, country rankings and some broad insights into SADC logistics performance. The LPI surveys completed by domestic participants in the logistics sector are used to populate country specific measures at a more disaggregated level and reveal some early indicators of cross-cutting issues at a macro level. This dual approach provides both an overview of country and regional performance, as well as a more fine-grained depiction of perceptions and measurements of key logistics indicators.

As noted, Sub Saharan Africa as a region has the lowest LPI score of any region in the world. The survey contends that any LPI score under 3 negatively impacts a country's ability to meet international value chain logistics requirements. The fact that the region scores poorly on each of the index's six sub categories suggests that logistics performance problems are broad-based and that no individual element is letting down an otherwise better performing sector.

Table 1: Regional LPI overall performance 2016

Region	LPI Score*	Customs	Infrastructure	International Shipments	Logistics Competence	Tracking and Tracing	Timeliness
Sub Saharan Africa	**2.47**	**2.36**	**2.29**	**2.49**	**2.42**	**2.39**	**2.84**
Europe and Central Asia	3.03	3.16	3.14	3.17	3.24	3.62	3.75
East Asia and Pacific	3.14	2.98	3.02	3.08	3.07	3.12	3.54
Middle East and North Africa	2.89	2.6	2.78	2.96	2.81	2.86	3.29
Latin America and Caribbean	2.66	2.48	2.46	2.69	2.6	2.67	3.05
South Asia	2.62	2.42	2.45	2.68	2.56	2.56	3.03

**Measured on a scale of 1-5 with 5 being a perfect score; Source: World Bank Logistics Performance Indicators, 2016 (World Bank, 2016)*

[4] An analysis of the World Banks LPI is favoured over the World Economic Forum's ETI simply because survey participants in the former are 100% in the logistics industry whereas the latter covers a broader survey population.

Variations across SADC member states is substantial. South Africa is the best performer with a ranking of 20th in the world in 2016 while Zimbabwe is one of the worst performers languishing in 51st place. The World Bank regards South Africa as an overperformer and Zimbabwe as an underperformer when compared to countries with equivalent income levels. The gap between good and poor performers is substantial. For example, if the scores of South Africa and Zimbabwe are compared to Germany – the global LPI top performer with a score of 4.23 – South Africa's logistics industry is only 12% worse than Germany's whereas Zimbabwe's is 108% worse. Of greater interest than absolute country variations is ranking – Table 2 illustrates ranking performance over time and reveals an important and disturbing trend.

Table 2: SADC Member LPI performance 2010-2016

	Rank 2010	Rank 2012	Rank 2014	Rank 2016	
South Africa	28	23	34	20	↑
Botswana	134	68	120	57	↑
Tanzania	95	88	138	61	↑
Namibia	152	89	93	79	↑
Mozambique	136		147	84	↑
Zambia	138		123	114	↑
Democratic Republic of Congo (DRC)	85		159	125	↑
Angola	142	138	112	139	↓
Madagascar	88	84	132	147	↓
Zimbabwe		103	137	151	↓
Lesotho		142	133	154	↓

Source: World Bank Logistics Performance Indicators, 2016 (World Bank, 2016)

The World Bank (2016) survey finds across all countries a persistence of logistics gaps in poor performers over time, while in top performers performance continues to improve off an already strong base. This has led to the identification of a widening gap between the best and the poorest performers. This trend is also evident in SADC where the worst performers in 2007 – Angola, Madagascar, Zimbabwe and Lesotho – have consistently performed worse in subsequent years 2012 and 2014. This contrasts with the top seven SADC performers whose LPI scores have increased over the same period. This suggests that some sort of virtuous circle of logistics exists and that a strong logistics base gives rise to continuing improvements and vice versa. As will be argued in Section 4, the existence of an increasing divergence may be a basis for some additional prioritisation measures to be applied in relevant SADC planning cycles, particularly for Zimbabwe, which is pivotal in the volume intensive North South SADC corridor.

At a member state level, South Africa meets the cut off 3 out of 5 score to qualify as meeting the requirements for global value chain entry. Botswana and Tanzania are knocking on the door, but the remaining SADC countries face a substantial deficit to address before they meet global value chain requirements. The scores in Table 3 reflect the international logistics community's view of individual country capacities and capabilities and would, for example, be part of the due diligence of a foreign

company seeking to invest in the region, or a global value chain deciding whether to include intermediate inputs from a member state supplier or not.

Table 3: SADC Members Sub Category Average scores, 2016

	Customs	Infrastructure	International shipments	Logistics competence	Tracking and Tracing	Timeliness	Total LPI score
South Africa	3.6	3.78	3.62	3.75	3.92	4.02	3.78
Botswana	3.05	2.96	2.91	2.74	2.89	3.72	3.05
Tanzania	2.78	2.81	2.98	2.92	2.98	3.44	2.99
Namibia	2.65	2.76	2.69	2.63	2.52	3.19	2.74
Mozambique	2.49	2.24	3.06	2.44	2.75	3.04	2.68
Zambia	2.25	2.26	2.51	2.42	2.36	2.74	2.43
DRC	2.22	2.01	2.33	2.33	2.37	2.94	2.38
Angola	1.8	2.13	2.37	2.31	2.21	2.59	2.24
Madagascar	2.33	2.12	2.17	1.93	2.01	2.35	2.15
Zimbabwe	2	2.21	2.08	2.13	1.95	2.13	2.08
Lesotho	1.91	1.96	1.84	2.16	1.92	2.35	2.03

Source: World Bank Logistics Performance Indicators, 2016 (World Bank, 2016)

South Africa, Tanzania, Namibia, Zambia, Angola, Zimbabwe and Lesotho all enjoy a higher LPI score on infrastructure then customs. This implies that relatively the efficiency of customs and border management clearance is more of a constraint in these countries than the amount and quality of physical infrastructure. In a similar vein Tanzania, Mozambique, Zambia DRC, Angola and Lesotho all enjoy logistics competence (the services of tucking companies, freight forwarders, clearing agents, brokerage) in excess of their infrastructure scores. This suggests that the sophistication and extent of their logistics industries, and hence their logistic potential exceeds their physical infrastructure which becomes a constraint. In the domestic portion of the survey, which is analysed next, the issue of infrastructure and operations on existing infrastructure is considered in more detail, leading to a contentious argument that it may be more beneficial to invest in improvements in logistical services and customs performance than in underlying physical infrastructure.

Answers to key questions in the domestic portion of the LPI are shown in Tables 4, 5 and 6. Analysing the questions in aggregate provides a better overview of the relative issues in the responding member states than considering in detail each of the questions and responses individually. It should be highlighted that some of the response percentages appear suspiciously extreme and often run contrary to much of the academic literature surveyed, the findings of the regional value chain projects completed to date, and some of the interviews conducted. At best the responses should be viewed as expressing an overall domestic perception of the relative strengths and weaknesses of individual member states.

Scorecards and survey responses are available for 10 SADC Member States. Responses from Angola, Lesotho and Madagascar have been excluded because they are highly incomplete.

Table 4: Quality of Infrastructure, SADC, 2016

Quality of Infrastructure

Evaluate the quality of trade and transport related infrastructure (e.g. ports, roads, airports, information technology) in your country of work	SA	Tanzania	Namibia	Zambia	DRC	Zimbabwe
Ports	21.43%	38.46%	0%	0%	0%	50%
Airports	0%	23.08%	0%	60%	0%	14.29%
Roads	0%	34.62%	28.57%	60%	0%	14.29%
Rail	50%	87.50%	100%	80%	50%	57.14%
Warehousing	0%	19.23%	0%	0%	50%	0%
Telecommunications and IT	14.29%	11.54%	0%	40%	50%	28.57%

Source: World Bank Logistics Performance Indicators, 2016 (World Bank, 2106)

Table 5: Quality of Transport and Logistics Services, SADC, 2016

Competence and Quality of Services

Evaluate the competence and quality of service delivered by the following in your country of work	SA	Tanzania	Namibia	Zambia	DRC	Zimbabwe
Road	41.67%	16%	42.86%	0%	0%	57.14%
Rail	25%	4%	0%	20%	0%	0%
Air transport	58.33%	20%	28.57%	0%	50%	42.86%
Maritime transport	41.67%	41.67%	57.14%	0%	100%	28.57%
Warehousing and distribution	41.67%	28%	57.14%	16.67%	0%	28.57%
Freight forwarders	50%	44%	57.14%	20%	50%	71.43%
Customs agencies	41.67%	44%	28.57%	0%	50%	71.43%
Quality/standards inspection agencies	50%	36%	42.86%	0%	0%	14.29%
Health/SPS agencies	22.22%	28%	16.67%	0%	0%	50%
Trade and transport associations	60%	28%	28.57%	0%	0%	57.14%

Source: World Bank Logistics Performance Indicators, 2016 (World Bank, 2016)

Table 6: Miscellaneous Questions, SADC, 2016

	SA	**Tanzania**	**Namibia**	**Zambia**	**DRC**	**Zimbabwe**
Clearance time without physical inspection (days)	1 day	2 days	2 days	3 days	5 days	1 day
Clearance time with physical inspection (days)	4 days	4 days	4 days	4 days	6 days	3 days
physical inspection (%)	4.00%	61.00%	7.00%	21%	75%	35.00%
multiple inspections (%)	2.00%	15.00%	2.00%	2%	61%	5.00%
Transparency of customs clearance is always efficient	83.33%	50%	57.14%	33.33%	0%	71.43%

Transparency of other border agencies is always efficient	41.67%	43.48%	28.57%	33.33%	0%	42.86%
Provision of adequate and timely information on regulatory changes is always efficient	50%	41.67%	42.86%	33.33%	0%	71.43%
declarations submitted and processed electronically and on line (%)	100%	100.00%	66.00%	100.00%	100%	100.00%
Expedited customs clearance for traders with high compliance levels is always efficient	66.67%	41.67%	42.86%	50%	0%	28.57%

Source: World Bank Logistics Performance Indicators, 2016 (World Bank, 2016)

Responses on the quality of infrastructure question clearly demonstrates that rail transport infrastructure is viewed as being of the lowest quality of all types of transport infrastructure across all seven surveyed SADC countries. This is no surprise, given historically low investment levels in railroad maintenance since independence. Under-investment has continued and accelerated under the road transportation plans of SADC and its member states in the recent past. While rail has the potential to provide an efficient and more cost-effective solution to intra-regional trade than the current road transport agenda, it is conceded by all researchers that, given the current state of rail infrastructure in the region, rail as an alternative to road can only ever be considered as a long-term option (Teravaninthorn and Raballand, 2009; UKAid 2014). Dissatisfaction with road infrastructure follows that of rail but appears suspiciously low (except in Zambia where a 60% dissatisfaction rating is recorded). Considering various assessments of the region's roads undertaken by USAID 2011, 2013 and the Cross Border Road Transport Agency (CBRAT) 2015, 2016, 2017 and academic work, such as Byers and Vanheukelom 2014, Vilakazi and Paelo 2017, and Teravaninthorn and Raballand, 2009, the reported World Bank scores on dissatisfaction with domestic road extent and quality seems surprisingly low. Marine ports and airports score relatively more favourably, and dissatisfaction with warehousing appears surprisingly low given a lack of investment in warehousing in the region over the past 20 years (Kerney, 2016).

Infrastructure

Table 5 records how member states rate the quality of competence and services rendered on their country's existing infrastructure stock. Read in conjunction with Table 4, a surprising picture emerges. Taking Zambia as an example – only 60% of respondents felt that road infrastructure was of low or very low quality while 100% of respondents believe that none of their road services qualify as being rated high or very high. In this case, despite infrastructure being identified as a grave concern, even greater concern is shown for the quality of road services and the competence of road haulage and logistics operators in utilising the infrastructure. Looking down Zambia's response column it is fair to argue that it is the SADC country least satisfied with its domestic service competence. Equally in Namibia, the response rates show that Namibians believe that none of their road infrastructure is of a low or very low standard but that 58% of the services offered on road infrastructure failed to qualify as high or very high. This is illustrative of a general view across Member States that services rendered on infrastructure are on average more of a constraint on logistics performance than the actual quality of infrastructure. In a different but related point, the World Bank's 2009 study of transport corridors in Africa concluded that the Bank's approach to

focused investment on physical road infrastructure in Africa from the 1970s to the 1990s had failed to deliver lower transport prices and that the end users of road transport services did not seem to fully benefit from such investments. The report posits that going forward the Bank would be well served to concentrate more effort on services employed on infrastructure rather than a continuation of a narrow physical infrastructure bias, as in the past. This coincided with the 2007 World Bank's inaugural publication of the LPI which described seven categories of constraints underpinning a poorly performing national logistics system – of which infrastructure was only one. Table 7 shows that even 2nd, 3rd, 4th quintile performers (designated as comprehensive and partial reformers) need to pay attention to issues other than merely infrastructure.

Table 7: Typology of countries based on constraining factors

	Logistics Friendly	Comprehensive Reformers	Partial Reformers	Logistics Unfriendly
Physical Infrastructure	x	Xx	xx	xxx
ICT related infrastructure		X	xx	xxx
Customs		X	xx	xxx
Other border procedures	xx	Xxx	xxx	xxx
Reliability of support services		X	xx	xxx
other government related constraints	x	Xx	xxx	xxx
Constituency for reform	x	X	xx	xxx

x=mild constraint; xx= moderate constraint; xxx= severe constraint

The research does not suggest that physical infrastructure in SADC is not an important constraint for lower transport costs and better performing logistics systems – but it does emphasise that even with the best infrastructure in the world, poor services, operations and practices can, and do, undermine the net benefit of such infrastructure investments. This is a recurring theme throughout the literature (Vilakasi and Paelo 2017; Byres and Vanheukeom 2014; Teravaninthorn and Raballand 2009) and will be expanded on in the next section where logistics inefficiencies related to operations are described in detail. Further in reviewing the way forward, the argument provides scope and possibly a new lens through which to consider current SADC and Member State problem prioritisation and the need for complementary activities in the field of transport and logistics.

Returning to Table 5, the question provides some interesting and important insights into the competence of key logistics service providers and stakeholders at a more disaggregated level. Private sector service providers and stakeholders as a group achieve higher competency scores than public sector stakeholders. One of the issues that arises is the large number of public sector parties with differing mandates that need to be accommodated and co-ordinated at a single national border. In South Africa, for example, 10 different national government departments are involved in border post operations (CBRTA, 2014). A study undertaken in Zimbabwe in 1997 and quoted in a 2015 CBRTA input on the difficulties of one stop border posts, found that 82% of the transporters surveyed believed that border delays arose from the actual management of border posts, border staff and resources; and that 95% believed that these management inefficiencies arose because of the un-coordinated way in which different functions at the border post were co-ordinated. The World Bank's 2007 survey suggested that 70% of customs delays were due to agencies operating at a border post other than the customs agency itself (World Bank, 2007). Table 5 shows that in Namibia and South Africa the competence and quality of inspection agencies are rated more highly than

customs agencies – while in all other SADC responding countries customs agencies achieve the highest competency rating compared to quality and standards inspection agencies and Health and Sanitary and Phytosanitary Standards (SPS) agencies. The problems associated with the myriad of players at a single border post is also highlighted in Table 6 where in all countries the transparency of customs clearance is viewed as nearly always more efficient compared to the transparency of other border agencies. Across all SADC members, SPS and health agencies receive the lowest competency scores by quite some margin. Zambia again stands out as assessing none of its agencies operating at border posts as high or very highly competent. As will be argued later in this paper, improving agency co-ordination at border posts and providing training to all agencies at the border in a co-ordinated manner may provide some low hanging policy win opportunities to improve logistics performance in the region. Such efficiency gains can be achieved at a member state level with little or no national sovereignty or integration issues arising[5].

All logistics and transporters operating across national borders highlight inspections as a key constraint which seriously adds to transit delays. As seen in Table 6, clearance times with physical inspections are often double or four times as long as clearance times when no physical inspection is undertaken. With a day delay at a border post costing on average US$350 per truck[6] per day, a physical inspection at a SADC border post comes at a high financial and opportunity cost for logistics operators and transporters. DRC and Tanzania undertake the highest percentage of physical inspections at 75% and 61% respectively. South Africa and Namibia inspect less than 7% of consignments, while the remaining member states inspect between 30% and 40% of loads. In Germany, the top LPI performer for the past six years, less than 3% of loads are physically inspected. Over and above higher physical inspection levels in SADC, several countries also undertake multiple inspections. Interviewees operating in the region suggest that the incidence of multiple inspections is higher than indicated in the World Bank Survey (2013, 2015 and 2016) . Logistics operators and literature review sources all strongly disagree with Table 6's characterisation of high levels of electronic and online processing of declarations. CBRTA 2016 cites that drivers require some 1 600 physical documents to meet the reporting requirements necessary to complete the route from Johannesburg to Zambia along the North-South Corridor, and all CBRTA reports from 2014 to 2017 list non-electronic submission of paperwork as a key constraint.

Table 6 also shows low levels of efficiency in expedited customs clearance for traders with high compliance levels or what are known as Authorised Economic Operators (AEOs). Most logistics companies fall into this category and ensure that goods are all pre-cleared at the point of origin. Expedited clearance is rated as 95% effective in top performing nations such as Germany and other EU trading partners (World Bank, 2016), while in SADC expedited clearance is effective on average less than 50% of the time. This is particularly problematic for SADC exporters utilising (more expensive) but more reliable and dependable big-name logistics suppliers and these company's reputations to better ensure that loads meet delivery schedules. The existence of AEOs in SADC

[5] The argument here is one of procedural efficiency gains and not any suggested intervention related to standardisation or harmonisation.

[6] For an 8 axel truck calculated by Ranganathan and Foster, 2011

should act as an enabler to accessing global supply chains, yet existing processes and border management are such that this potential advantage is not harnessed[7].

Finally, it is important to look at telecommunications and ICT. In the modern era the physical movement of goods now entails the efficient and timely exchange of information making the quality of ICT infrastructure a significant determinant of logistics performance (World Bank 2007, 2016). ICT, telecommunications and advanced track and trace services are bed rocks of the logistics and distribution industry in developed countries. Consistently in this research the topic appears to be less of a focus in the SADC agenda and member state approaches to dealing with high transport costs and low logistics performance levels. In developed countries less than 5% of countries cited ICT and telecoms infrastructure as being of low quality. Across SADC states an average of 25% of respondents found ICT and telecommunications infrastructure to be of a low or very low quality – a far higher percentage than in developed nations but a far lower rate than expected. Operators in the region suggest that emailing documentation and computerisation is a major stumbling block in all member states (including South Africa but to a far lesser degree); that ICT usage is hampered by a lack of electricity at border posts; and that even when documents have been submitted online, hard copies are still required and examined.

In the totality of the research undertaken, it appears that the domestic response portion of the World Bank's LPI related to SADC Member States paints a rosier, more sophisticated portrait of the regions logistics infrastructure, capabilities and performance than operators experience when servicing the importers and exporters of the region. At a broad brushstrokes level, what the survey does illustrate is that infrastructure is not always the most constraining logistics performance factor but that processes and operation on infrastructure are crucially important. Border post activity is highlighted as the major site of constraints – which includes: border post processes and capabilities, co-ordination of multiple parties and agencies, and physical inspections. These all contribute to an overall performance level for the community that is below what is necessary to access global value chains, or operate competitive regional value chains.

The next section turns to a more detailed analysis of the cross-cutting logistics issues identified: i) in a review of the literature; ii) interviews with South African firms operating throughout the region; iii) regional value chain reports completed to date, and iv) the tradebarriers.org complaints website established by the Tripartite Community.

3. CROSS-CUTTING LOGISTICS ISSUES FACING REGIONAL VALUE CHAINS

Logistics firms (as opposed to transporters) offer clients end-to-end solutions. At its most extensive, for example in the case of a big five South African retailer and one of the top three logistics providers in the country – the logistics company is responsible for ordering product for its client from overseas, clearing the shipment at the port, offloading the shipment and placing it on an appropriate transport mode to deliver it to the client's warehouse (which is run by the logistics firm and not the client). From there the logistics company, which has an integrated IT system with the clients and its network of stores, will distribute product from the warehouse to local (South African) and SADC

[7] One of the reasons cited for low expedited clearances is the lack of a dedicated lane at border posts to accommodate such operators. This is a physical infrastructure limitation on top of an operational limitation.

stores by road, taking responsibility for all clearance processes along the way. In the example cited, deliveries to individual stores are completed on time between 90% and 100% of the time. At any minute, the client can track and trace where a shipment is. Seventy percent of the cost of the service relates to transport costs; 30% of the costs are pure logistics costs (and margin). The logistics costs cover all the value-added services, co-ordination, and optimisation of the client's supply chain. Firms are happy to use the services of a logistics provider so as to concentrate on their core business, to outsource activities in which they are not specialists – but most importantly to optimise their supply chains and ultimately save money and increase profitability. Almost all large, blue chip and transport intensive firms use logistics companies in preference to using straight transporters. The key drivers are costs and predictability.

From the client's perspective the firm's competitiveness is crucially influenced by the cost and performance of its supply chain and thus overall logistics environment in which it operates. Firms bear the direct costs associated with moving goods, for example: road haulage costs, port and handling charges, bond fees, agent fees (and logistics charges if applicable) – but importantly, they also absorb induced or indirect costs. These induced costs arise when their supply chain lacks reliability and predictability. In the face of this uncertainty, adaptive behaviours, such as holding higher levels of inventory, switching to more expensive modes of transport or hedging activities, are undertaken (Arvis et al 2007, Gausch 2003). These induced costs are inversely related to predictability and tend to rise steeply with declining logistics performance. Arvis 2007 and the World Bank Survey (2007, 2016) argue that direct logistics costs tend to be similar across countries in a given region and are thus less of a factor in determining competitiveness than induced costs. They conclude that the high induced costs due to unpredictability along a supply chain is the major constraint faced by developing world firms and regions in successfully diversifying into high value-added production and accessing global value chains. The 2007 World Bank Survey cites an example of two suppliers to the same automobile manufacturer. The Italy based supplier holds seven days inventory. The Moroccan based supplier holds 35 days inventory (World Bank 2007).

While the induced cost element of poor logistics performance is important in a SADC context, none of the value chain studies completed in the broader programme of work raised this specific aspect in relation to firm level competitiveness. No previous studies were found on the topic. As such the general point is noted[8] but focus is limited to the direct cost component as it relates to competitiveness.

Costs and standing time

A series of seminal papers by the Centre for Competition, Regulation and Economic Development (CCRED) (2016, 2017), various World Bank LPI analyses (World Bank, 2007, 2012, 2014, 2016), technical reports from donor agencies (USAid 2011, UKAid 2014), a myriad of academic working papers (Byers and Vanheukelom 2014, Teravaninthorn and Raballand 2009, Ward and Baretto 2011) and agency annual reports (CBRTA 2014, 2015, 2016) have focused on understanding why SADC road transport costs are as high and uncompetitive as they are. Given that 70% of the cost of logistics is directly related to transportation - the cost drivers established in the completed transport

[8] Given the literature and international examples it may be worthwhile to undertake a quantitative and qualitative study to determine the impact of holding larger inventories on the competitiveness of firms in SADC.

sector research apply equally to the logistics sector. Indeed, logistics is essentially about optimising transportation to minimise costs to logistics company clients.

The most important variable in understanding logistics company behaviour and identifying the cross-cutting issues which plague the industry and create the basis for uncompetitive transport costs in the region – is fixed costs.

As with any firm, logistics operators face fixed and variable costs. Variable costs vary with fleet utilisation and include: fuel, drivers' wages, drivers' night allowances, and vehicle crossing fees at border posts. Fixed costs include overheads and most importantly the financing costs and depreciation of fleet vehicles. The costs of fleet financing and depreciation are incurred whether a truck is moving and earning revenue or whether it is stationary in a queue at a border post. In the industry this cost is known as the standing cost based on the term "standing time", which is used to describe the time a truck is not moving. In the transport sector research noted above, this cost is often described as induced costs for the logistics or transport provider or an opportunity cost. Essentially it is revenue forgone and is estimated in Vilakasi and Paelo (2017) at between US$400 and US$600 dollars a day. These figures are confirmed in the current study with firms identifying that standing costs for brand new, high spec trucks and equivalent costs for older lower spec trucks vary by as much as 50%. This is relevant as it affects the relative impact of standing times on differently constituted fleets and contributes to the overall competitiveness of the logistics provider. For example, the penalty for a Zambian transport operator using a low spec, second-hand up truck sitting at Beit Bridge for four days will be considerably lower than the equivalent delay for a South African transporter operating a brand new high spec truck. Standing time is the single most important variable in the operations and costs of logistics in SADC. It impacts all aspects of logistics decision making including backhaul decisions.

In the literature, four factors are identified as driving high transport costs in SADC: 1) border delays; 2) lack of backhaul and return loads; 3) direct fleet costs, and 4) border and administrative logistics costs e.g. road user charges, parking fees. Much of the literature (and particularly the individual value chain projects completed within the broad regional value chain research effort) suggest that the lack of backhaul opportunities may be the most important driver of uncompetitive transport pricing in the region. The logic is faultless in the conclusion that if a full truck departs Johannesburg for Lusaka and returns empty then all the charges for the complete roundtrip must be borne by the goods being conveyed on the outbound leg alone – thus increasing the transport cost per unit substantially.

All logistics operators interviewed fundamentally disagree that a lack of backhaul opportunities in SADC is the most important driver of high transport costs. They contend that the most important explanatory variable is border delays and standing time. Table 8 shows the relative importance of various cost drivers for different sizes and levels of sophistication of logistics companies based on interviews. For both large and smaller logistics providers standing time is rated as the most important determinant.

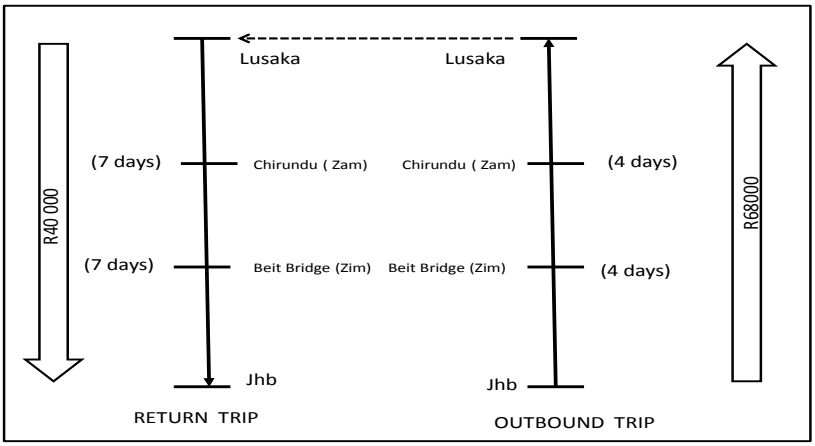
Table 8: Drivers of high transport costs in SADC: interview results (average %)

	Large Logistics Companies	Small Logistics Companies (small transporters)
Border Delays (standing time)	60%	45%
Direct Costs (fuel, wages)	7%	10%
Border charges and fees (road user charges, carbon taxes)	3%	5%
Lack of backhaul opportunities	30%	40%

Source: Interview findings

A numerical example is used to explain how a typical logistics company makes operational decisions and demonstrates the centrality of standing time in all decisions – and hence industry outcomes. What the example in Diagram 1 illustrates is the linkage between standing time and return load composition and volumes.

Diagram 1: Illustrative example of round trip options and costs



Source: own design, data from interviews, illustrative prices only

A logistics company leaves Johannesburg with a cargo of groceries destined for Lusaka. The negotiated price for the delivery to Lusaka is R68 000. In line with the wishes of the client a new truck is used and based on depreciation and financing costs standing time costs related to the vehicle are R5 400 a day. On the outbound leg an average four days delay at Beit Bridge and a further four days delay at Chirundu (despite pre-clearance having been obtained) amounts to R43 200 of standing costs which are included in the price quoted and accepted by the client. This is 64% of the transport cost charged to the client and hence ultimately borne by the unit cost of the transported products. Once the truck has unloaded in Lusaka a decision is taken whether to bring the truck back on the return leg with a load on board or whether to run the truck back empty. Prices for return legs from Zambia to South Africa are cheaper than outbound legs because there is so much more competition for return leg loads that clients can bid prices down. In this example the firm's best available load option is to earn R40 000 for a return load making total revenue for the round trip R108 000.

Different return loads face different experiences at border posts. Bringing back copper from Zambia to South Africa is known to be the most time intensive haul due to considerably more complex customs and duties being applied because of historic criminal activity related to copper. Copper is viewed as the "worst" load to clear customs; and it is the norm for border delays to be 75% longer

than loads of agricultural or manufactured products. Assuming the return load takes 14 days[9] to reach Johannesburg for offloading at City Deep – the 14 days standing time amounts to a cost of R75 600, a sum more than the revenue earned for the trip even before fuel and wages and road charges have been taken into account. Faced with this situation the profit maximising decision of the logistics operator is to return the truck empty and rather make it available sooner for another outbound trip. It was found that standing time delays at border post halved optimal fleet utilisation in terms of outbound trips per month; and that it is the key reason behind trucks returning empty on the North South Corridor. In the example above, even if the truck returns with an agricultural load and encounters four days delays at two border posts, the logistics firm would still maximise profits by returning empty instead of incurring R43 200 of opportunity costs for aR40 000 contract price.

The numerical example illustrates the percentages attached to logistics cost drivers in Table 8. What it emphasises is that border delays dwarf all other cost drivers in determining transport costs to clients and hence value chain firm competitiveness. It also illustrates that return load decision-making is not only constrained by load availability but the composition of the load and the consequence this has for anticipated standing times during the return leg.

It is necessary to understand an additional aspect of logistics firm behaviour before identifying the sources of border post delays. It is a point which seeks to further unpack an understanding of the relative importance of backhaul as a constraining factor in improving SADC intra-regional logistics.

The existing literature on SADC value chains, and the work completed on the transport sector referred to above, contends that return load availability is a substantial issue especially for South African trucks returning from countries along the North South Corridor – especially Zimbabwe and Zambia. This contention makes sense given intra-regional trade imbalances and the composition of imports and exports along the route. Interviewed firms contend that return load availability is an issue only about 20% of the time but that in most cases (80% of the time) loads can be sourced. This is achieved in two ways – both of which are crucial to understanding the operations of the industry.

First, logistics operators invest substantial time and human resources into developing and maintaining a broad array of contacts across all sectors in all member states and especially along routes they take most often. All the companies interviewed had contracts with firms in multiple sectors including: mining, a broad array of agricultural sectors and, some, with firms operating in the production of final or intermediate manufactured goods[10]. This means that in principal the chances of identifying a return load for a large sophisticated logistics operator is relatively high anywhere in SADC. Smaller logistics companies and pure transport companies do not enjoy this luxury. Identifying backhaul opportunities for smaller operators is thus more of a constraining issue than for their larger competitors, as indicated in Table 8. However, smaller logistics companies and transporters can find backhaul opportunities through the actions and business model of the large logistics operators.

The top logistics operators working throughout SADC all operate by accepting transport contracts substantially in excess of what their fleets can actually haul. This is done to ensure that a fleet truck

[9] Seven days in Zambia for inspection and paper work before being able to leave plus seven days at the Zimbabwean border.

[10] The client base is heavily skewed towards agricultural and mining clients as anticipated from the trade composition data.

is never not in use due to a lack of demand. Excess demand for logistics and transport services is taken up by the large logistics firms through subcontracting deliveries to approved sub-contractors.

In an example given, a large, sophisticated logistics company operated a fleet of 800 trucks, which it owned, but on any given day required 1 400 trucks to meet its commercial contracted obligations. As such 600 sub-contracted transporters moved SADC loads on behalf of the company daily. An approved transporter moving a product from Botswana to Zimbabwe for its own customer, could thus seek a return load from a third party big logistics company in Zimbabwe, if that logistics company has excess demand for loads from Zimbabwe to Botswana (due to it over-committing), it will sub contract to the Botswanan transport company. In this way, smaller logistics companies and transporters can leverage off the large logistics providers' broader client base. As such it is the smallest and least professional transporters and logistics companies that fail to meet the accreditation criteria of the large logistics companies – that are most constrained by an inability to find return loads.

Hard and soft cross-cutting issues

To recap the key point being made: out of the four factors identified as driving high transport costs in SADC: 1) border delays, 2) lack of backhaul and return loads, 3) direct fleet costs, and 4) border and administrative logistics costs – border delays are the most important issue across all value chains and all member states. All industry players are unanimous that if authorities can improve the efficiency of border post crossing in a way to meaningfully cut standing time – transport costs will substantially decrease. Backhaul opportunities are rated as the second most important driver of high SADC transport costs but often the decision to undertake a return leg empty is more commercially viable given the induced costs connected to standing times because of border delays. As such backhaul *availability* is not always the issue – sometimes it is the commercial viability of that backhaul leg which is the issue. This issue can also be addressed by decreasing delays at border posts. Direct costs and fees and expenses incurred at border posts are relatively minor drivers of higher transport costs in the region, but they do impact final prices and importantly route determination. Direct costs and border costs and fees are more of an issue for smaller operators than the large logistics firms.

The collective findings of: i) the literature review, ii) the review of completed value chain projects, iii) the tradebarriers website complaints analysis, and iv) the interviews conducted are shown in Tables 9 and 10. Despite the centrality of identifying these cross-cutting issues to the focus of the research, a simple list is provided because the issues are well known and documented, self-explanatory and mostly self-evident. A few issues are expanded on.

Table 9: Soft cross-cutting issues

Border post delays	non-standardised system for import declarations
	non-standardised system for payment of import duties
	non-acceptance of certificates and trade documentation
	incorrect tariff classifications
	Pre-clearance ineffective as still need to wait in line to reach front of the queue
	time taken to complete and approve documentation
	lack of integration of internet based clearing system

	lack of a single window leading to duplication of processes even at so called one stop border posts. Limited cooperation between border post personnel
	high rate and totally random physical inspections
	delays in waiting to be scanned (equipment often out of order)
	multiple inspections
	delays in non-customs agency inspections and processes
	limited and uncoordinated customs operating hours for commercial vehicles. Bad work ethic among border stakeholders
	lack of bond guarantee schemes
	lack of harmonisation of road weight limits
	lack of harmonisation of driving licence requirements
	lack of harmonisation of driving hours and compulsory affixing of recording devices
	lack of harmonisation of visa and work permits for drivers
	lack of harmonisation axle load limits
	lack of harmonisation road worthiness certificates
	lack of harmonisation on categorisation of classes of vehicles
	Lack of sufficiently skilled people at border posts and training in silo's
Uncommunicated Changes	Changes in border post processes and regulations which are not communicated to logistics and transport companies
Cost issues	fuel levies designated as road charges
	vehicle licence fees
	road tolls
	abnormal and awkward load charges
	weight distance charges
	cross border user charges
	entry fees payable by foreign registered vehicles
	parking fees
	congestion charges
	charges for scanning
	weight bridge lack of calibration leads to overload fines
	insurance requirements and lack of harmonisation on liability limits
Corruption	unofficial and illegal road blocks
	official road blocks where vehicles are stopped despite no evidence of suspicious cargo
	theft from trucks parked overnight waiting for customs to open
	bribery at border posts
	bribery at weight bridges
	bribery at posts to be allocated loads

Table 10: Hard infrastructure cross-cutting issues

Road infrastructure quality
Road infrastructure quantity and quality of feeder road system
border post precinct expansion to deal with increased transit volumes
feeder road system into border posts and the need for separate lanes for commercial and passenger traffic and pre-cleared and not pre-cleared traffic and for empty trucks
lack of truck queuing space within border precinct
lack of parking within border precinct
lack of inspection bays

lack of queuing space at weighbridges
expanded administrative buildings
unpredictable electricity supply
generators insufficient in size to maintain normal operation if power failures
unpredictable LAN, WAN, internet connectivity
uneven distribution of weighbridges along routes

Seventy-eight percent of all tradebarriers.org complaints captured on the portal are accounted for by border delay issues, clearing issues and other procedural border post problems. Interviewees describe SADC border posts as repositories of "disorganised chaos". They all claim that such chaos is partly by design (this argument and possible motivations are unpacked in the next section) and that as soon as transporters and logistics firms get a handle on processes and procedures at a border post (such that the disorganised chaos becomes organised chaos), the border authorities change the processes and procedures to re-establish the disorganised chaos. This "conspiracy" view would be easier to dismiss were it not for the fact that every large- and medium-sized logistics and transport operator interviewed hire "runners" at every border post. Runners have the simple task of ensuring that they are up to date (on a daily basis) with changes in how a border post operates – ranging from which window a driver needs to queue at to which form needs to be filled out. Operators claim weekly and sometimes daily changes are not formally communicated. It is worth the while of the operator to incur the cost of a runner to decrease avoidable standing time at the border. Border officials are said to make such changes and create chaos to maximize opportunities for corruption.

SADC border post efficiency was rated from best to worst as follows: South Africa, Botswana, Namibia, Lesotho and Swaziland, Zambia, Malawi, Mozambique and Zimbabwe. The inefficiency of Zimbabwean border posts relative to Botswana border posts is such that many interviewees admitted that on the 1 600km trip from Johannesburg to Lusaka, it was more commercially viable to add the direct costs of an additional 600km to the trip to route freight through Botswana to avoid the Beit Bridge border. Given the centrality of Zimbabwe in the region, its low performance rating on the LPI, its decreasing rating from the period 2007 to 2016, and the views of industry players about avoiding the country in routing decisions, it is apparent that in prioritising intervention across SADC member states, initiatives to resolve Zimbabwean border post issues need to receive the utmost time and prioritisation.

While all the issues in Tables 9 and 10 are relevant to a list of cross-cutting aspects that impede the cost-effective transportation of intra-regional trade, response to their relative importance is mixed and often quite muted. There is consensus that among hard infrastructure issues the two most important issues are the creation (and usage) of a dedicated lane at the border for pre-cleared shipments. Logistics providers spend considerable time and effort in pre-clearing shipments at their point of origin. They find that when they get to the front of the queue this fast-tracked clearance is usually (but not always) honoured and crossing times are reduced. However, at all border posts pre-

cleared trucks need to queue with non-pre-cleared trucks, thus incurring substantial standing time waiting to get to the front of the queue before expedited activities can be activated[11].

A second consensus view on hard infrastructure is that all steps possible should be taken to ensure that border posts have sufficient electricity to operate at full capacity (all functions) and that internet access reliability is substantially upgraded. Power outages (for up to 12 hours) are experienced at most border posts (except South African) about once every seven to eight weeks. The issue appears not to be the actual day of the outage but the fact that the backlog of trucks unable to be processed becomes a major standing time issue. A 12-hour power outage at Beit Bridge results in a 16 to 20 kilometre queue of trucks which takes seven to eight days to clear.

Turning to soft issues, industry players appear to be more understanding of certain areas of non-standardisation than potential implementing agencies (CBRTA) or SADC itself. It was generally found that the industry has no problem with non-standardisation as long as they understand the reason for it. For example, in some literature it was raised that Tanzanian officials categorise super linked vehicles as abnormal load vehicles while they are accepted as regular vehicles in all other SADC countries. Industry players had no problem with this deviation given the curving nature and quality of roads in Tanzania which they believed would never be suitable for a super linked truck to navigate safely. Similarly, the industry is not fazed by variations in axle load limits across the region despite CBRTA, UKAid and others raising it as an issue. The industry accepts that the quality of roads across the region differs substantially and that inferior construction of roads has a negative impact on the axle weight that can be driven without damaging the road. While they wish that the quality of all SADC roads was superior to what they currently are, they understand current constraints and operate around the constraint.

Issues that are more concerning to the industry, and which have gained attention in recent years are the issues of insurance and bond guarantee schemes (Vilikazi and Paeto 2017, CBRTA 2015, 2016). Bond guarantee schemes would simply allow duty payments to the relevant fiscal body (e.g. South African Revenue Service or Zambian Revenue Authority) to be made on account, electronically rather than physically at the border post if there has been no pre-clearance. Logistics operators see such a scheme, if it were honoured by all member states as possibly being an avenue to reducing standing times and improving border post efficiency. Similarly, a unified insurance system would also decrease border delays and required documentation. At present South Africa and its SACU partners utilise a fuel levy system whereby third-party insurance is factored into the fuel price. In other member states the Yellow Card System is utilised which offers transporters insurance against any accident in a foreign participating country. SACU-based logistics and transporting companies thus have to purchase additional insurance from a South African insurance company to cover them when they travel in the region. Physical inspections are highlighted as a major gripe and major contributor to standing times and the industry agrees with the broader point made in the World Bank LPI survey that other agencies such as Bureau Veritas responsible for clearing agricultural loads through Zimbabwe tend to perform less well on average than pure customs agencies.

[11] The logic applies equally to empty trucks. A dedicated lane for empty trucks (or empty trucks using the pre-clearance lane) would reduce standing time for empty trucks and increase fleet utilisation rates thereby driving down costs.

There is also consensus that route charges are high and could be reduced which would assist in bringing down transport prices charged to customers. As shown in Table 11 it can cost around US$3 000 dollars to pay for all costs between Johannesburg and DRC. While these costs are dwarfed by standing costs they nevertheless are substantial in absolute terms.

Table 11: Charges along North-South Corridor via Botswana (US$)

South Africa	**(Martins Drift Border Post)**		
	Transport permit	258	
	Permit Application Fee	74	
	Tolls	142	479
Botswana	(Groblersburg B/P)		
	TS Transport permit SACU	98	
	Permit Application Fee	11	
	Road Safety Tax	4	
	MVA Accident Fund (valid 3 months)	6	119
Zambia	(Kazungula B/P)		
	Carriers Licence (valid 12 months)	113	
	Yellow Card	67	
	Municipality Fee	20	
	Carbon Tax	38	
	Parking Fee	5	
	Road User Charge	200	
	Crossing Fee	250	693
DRC	(Kasumbalesa B/P)		
	Entry per person (2 weeks)	55	
	Border crossing fee	200	
	Parking Fee	10	
	Government Tax	65	
	Carbon tax	35	
	Card Entry	15	
	Insurance	465	
	Road User Charge	79	
	Tourism yellow fever vaccination	35	
	Photocopies	10	
	No yellow card	8	
	Fumigation (each entry)	50	
	Kasumbalesa to Kolwezi	900	
	Break-bulk cargo	20	1 947
TOTAL COST			**US$3 238**

What is frustrating for policymakers in this field is that the collective set of cross-cutting issues related to inefficient logistics and transport operations in the region and across member states are well known and extensive. The frustration lies in the impossibility of identifying a reduced list of narrowly identified specific items which most negatively impact border efficiency and hence should be prioritised. Even industry players are unable to apportion blame and identify very specific

challenges past the general state of chaos at border posts and the substantial standing time which they are faced with. In the next section, several views are offered as to why the nature of the problems appears so difficult to pinpoint and how solution seeking is highly constrained.

4. PLANS AND IMPLEMENTATION PROBLEMS

Logistics, border posts, intra-regional transport and specifically intra-regional road transport and road transport development corridors feature in virtually every SADC integration document since 1996. The topics are to be found in the: Regional Infrastructure Development Master Plan, the Industrial Upgrading and Modernisation programme, the Regional Agricultural Plan, the Industrial Policy Development Framework, the Regional Action Plan on Investment, the protocol on Transport, Communications and Meteorology, and the protocols on Trade and Trade in Services. Harmonisation, standardisation and improved efficiency at border posts are scattered outcomes sought throughout the documents, but in their most detailed form in the 1998 Protocol on Transport, Communications and Metrology where for example in Chapter 3 member states commit themselves to endeavour to enhance efficiency of the processing of cargos at transhipment points, frontiers and destination points by all means including: the development of simplified and harmonised documentation (3.4b); the implementation of state of the art rapid communication, information and data processing and exchange facilities (3.4c); improved clearance and pre clearance procedures at border posts (3.5a); simplified requirements for imports, exports and transit movement of goods and road vehicles (3.5b); and the promotion of harmonised national road user charging systems (4.5.2).

Most recently, the 2017 SADC Industrialisation Action Plan cites improved logistics to support growth and competitiveness of priority sectors as a key expected outcome of its Improved Trade, Transport and Transit Facilitation Measures to Support Industrialisation (SADC II.3.7). The targeted outputs are: 1) to align hard and soft trade infrastructure improvements to reduce trade costs and facilitate production in priority sectors; and 2) simplify the trade regime within SADC. Three key performance indicators follow: i) improved performance on the World Bank LPI; ii) performance on customs border efficiency; and iii) improvements in time releases for imports and exports. This current positioning of the logistics issue suggests that the SADC authors have understood the importance of customs border efficiency and LPI performance as key cross-cutting logistics constraints in the drive towards increased regional integration and regional value chain competitiveness. It shows that there is no asymmetry of information or lack of awareness of what the issues are. Second the positioning is also interesting in that it places the logistics issue in the space of industrialisation and priority sectors whereas previously it has traditionally fallen within the spatial development corridor agenda. As will be argued below, changing the paradigm within which cross-cutting logistics constraints are debated and discussed may be a potential step in re-invigorating a moribund area of regional integration implementation.

The literature contains some interesting views on why SADC plans, protocols and instruments to date have failed to deliver on improvements in member state border post efficiency and transport

logistics inefficiencies. Consensus exists that there has been a lack of implementation regionally and at a member state level. Authors diverge as to what is driving this lack of implementation.

Erasmus et al (2015), in their analysis of the commitments, institutional structures, mechanisms and support needed to eliminate policies and procedures that economic operators report on non-tariff barriers in SADC, show that SADC agreements do not contain a binding obligation to domesticate agreed on instruments. This means that regional policies are not necessarily aligned with national policies, and as highlighted in CBRTA 2017 national and regional policy goals often differ or contradict each other. Hartzenberg and Katenga (2015) and Erasmus et al (2015) go on to argue that generally the failure of member states to comply with regional obligations does not appear to have any consequence, which leads them to conclude that SADC protocols may be interpreted by member states as best endeavour instruments and not rules based instruments with consequences for non-compliance. If non-adherence does not matter, then best endeavours will only be sought when there is substantial member state political will.

Raballand, Relas, Beuran and Isil (2012) looking at dwell times of containers at sea ports argue that political will can only be understood by looking at economic rents, an argument that Byers and Vanheukelom (2014) find equally compelling in the context of one stop border posts.

Raballand et al argue that binding constraints in Africa are the result of an equilibrium in which certain actors benefit from the existence of the constraint. In this context they argue that dealing with the proximate cause of the problem is unlikely to trigger a solution. Rather they argue that it is necessary to understand the interests of the parties involved and to look for ways to overcome those interests in favour of the public interest. They conclude that market incentives are too low for supply side measures alone to bring about radical improvement in trade logistics inefficiency. Transparency is not welcome in these contexts because it is synonymous with the suppression of rents and the promotion of competitive environments. On a positive note, they argue that the potential number of actors who may be drivers of change in the logistics sector is much lower than generally anticipated. They use Durban Port as an example, showing how the presence and determination of the strong automotive sector was able to bring the public authorities on side to deal with the necessary inefficiencies at the port.

Havenga (2010) disagrees with Raballand et al's idea that there are a lower number of actors involved in logistics than anticipated. Havenga looking at the South African government's failure to improve logistics performance since 1994 suggests that improving logistics performance in any country is constrained due to high levels of fragmentation in accountability, strategic process, infrastructure investment and public private interaction. This approach is more practical and less political economy in its take on poor implementation of logistics improvement schemes and initiatives in SADC.

Havenga claims that in all member states there are multiple government departments and agencies responsible for the country's logistics. In South Africa the count is 10 departments and agencies excluding the two new co-ordinating agencies which have been established to counter the issue of high levels of fragmentation. This engenders an environment in which no single stakeholder is accountable for improving the ease with which intra-regional trade is undertaken – a fragmentation of accountability. Adding to this, it is noted that skills shortages in public sector logistics sector

management and policy exacerbate the problem as a small pool of skills needs to be divided across a large number of public sector authorities and needs. If a smaller number of divisions were responsible for the logistics agenda, these skills would be more able to achieve critical mass.

Related to this, Havenga continues his fragmentation argument by showing how the large number of public sector logistics players results in many policies which are not co-ordinated, integrated or even consistent with one another. This creates a policy vortex of competing outcomes nationally which creates a poor base for any potential co-ordination with regional policy. The point being made about member state policy fragmentation is that even if there is a political will to co-ordinate national and regional policy – the lack of a singular national policy approach will undermine any regional alignment best endeavours. Havenga rounds off his fragmentation argument by explaining that just as logistics policy fails to be co-ordinated at a national level so too are logistics investment decisions. Finally, he suggests that different accounting authorities, different departments and agencies, and different policies are all inconsistent in how they interact with private sector stakeholders. For example, initiatives around the Maputo development corridor were a fine example of public private partnership yet there is no organised role or voice for private sector logistics providers in the country's approach to improving border post efficiency (Havenga, 2010, CBRTA 2017).

Byers and Vanheukelom (2014) bring some of these strands of argument together looking at drivers and lessons learned from the Maputo Corridor. First, they raise the point that top down linear regional integration (the SADC model to date) creates active resistance in so far as it is interpreted as limiting member state sovereignty. More importantly, however, they argue that there is substantial passive resistance to inter agency co-ordination on the ground. Looking at the one stop border post between South Africa and Mozambique they found that resistance to the one stop border post on the ground was not about the technical agreement to simplify procedures and agreeing a common framework. Instead they found that the issue was that a co-ordinated approach diminishes the discretion of individual agencies and may result in redistributional shifts in resources and responsibilities. As such co-ordination directly (and negatively) affects the variety of opportunities for rent seeking of a range of service providers and hence may create obstacles. In this environment the centralised political will of the member state is paramount and often insufficient.

With logistics being such a rich and fertile area for rent seeking, and for a variety of national sovereignty, agency sovereignty and fragmentation reasons suggested in the literature, there is little surprise that implementation of instruments and initiatives to decrease border post inefficiency and delays has been ineffective to date. Hartzenberg and Katenga contend that there is a tension between the linear integration approach adopted to date by SADC, which requires governance that transcends sovereign member states, and a new emerging regional discourse that emphasises the need to avoid supranational mechanisms as a way to promote integration. This tension needs to be explicitly factored into the SADC logistics debate going forward. Hartzenberg is a believer in practical integration from the bottom up. This is tentatively explored in the next section.

5. SOME IDEAS GOING FORWARD

Reducing the standing time of trucks at border posts is the most important single cross-cutting logistics issue facing all value chains in all SADC member states. It is crucial to reduce transport costs to increase producer level competitiveness and intra-regional trade, and the most important way to drive costs down is by reduce standing times. Reducing standing times at border posts requires improvements in process and procedural shortcomings and inconsistencies. These are well known to all parties. The disorganised chaos which characterises SADC border posts needs to be replaced with streamlined, predictable, deliberate, harmonised and co-ordinated activities which – at a minimum – halve current standing time norms. Just as trade has been liberalised and tariffs across SADC borders eliminated – so the current non-tariff barriers of ineffective logistics and transport need to be eliminated.

It is evident in relation to progress to date that SADC integration efforts in the field have enjoyed some success but that much work remains to be done. Recent lack of implementation of corrective actions may be explained partly by the fragmented nature of the subject matter, partly by a lack of member state political will, and partly by rent seeking by various agents and parties on the ground at border posts. Against this background it is hard to discern potential avenues of investigation and practical suggestions which might inject some renewed impetus into a stagnating agenda.

One recommendation is to take the logistics, and particularly the border post delay issue, out of the politically charged trade and infrastructure agendas, and place it in the industrial integration agenda. The individual value chain projects completed to date create a strong foundation and argument for such an approach. For example, in a note on the poultry industry, CCRED (2017) research shows that Zambia produces soya that can be used as animal feed in the South African poultry industry at US$390 a ton. Land transport for the soya from Zambia to Johannesburg amounts to US$110 per ton resulting in a landed price of soya in Johannesburg at US$500 a ton. Argentinean soya is sold at US$380 a ton but arrives in Johannesburg at a landed cost of $490 a ton. As such, even though Zambia can produce and sell soya at a competitive price, the excessive transport costs across the region undermine the competitiveness of the product and deep-water products end up being substituted for regional products. If transport costs across SADC were reduced to competitive rates (around US$50 or US$60 a ton), as they could be if standing times were reduced substantially, then landed Zambian soya in Johannesburg would be more competitive than Argentinean imports. This would be a win-win-win solution for Zambian soya producers, South African poultry producers and the transport and logistics industry.

In a similar vein Ledger's (2017) value chain report on agricultural inputs is even more insistent at stressing the importance of the need to improve transport and logistics performance. The report shows that close to 50% of the cost of agricultural inputs is attributable to transport costs and that farm gate prices for fertiliser in Sub Saharan Africa (excluding South Africa) are double European farm gate prices. The report argues that there can be no meaningful growth in regional value chains in any part of the agricultural sector until the issues around the cost and reliability of transport services in the region have been addressed. The report continues that transport and logistics is such a serious constraint that it may be necessary to adopt an approach within SADC that ensures the

bulk of all money to be spent on the Regional Agricultural Investment Plan must be allocated to transport infrastructure and efficiency improvements.

Moving logistics performance improvements onto the industrialisation and particularly the value chain integration agenda potentially allows for new breath to be blown into an old topic from a bottom up perspective that it is easy for politicians to get behind and support. Whereas it may be difficult, for a national government to harness its political will on an issue that is perceived as diminishing sovereign power and reducing opportunities for rent seeking by vested agencies and groupings for the sake of an abstract increased trade agenda; it should be easier to garner such political will around a collaboration across a distinct value chain with quantifiable and short term realisable outcomes. It is probably therefore worth considering raising logistics issues as a crosscutting value chain issue which needs to be handled within the ambit of the regional industrialisation set of initiatives. Just as Raballand et at (2012) argue that the automotive industry in South Africa organised itself and lobbied national government authorities to improve Durban port performance to support sectoral growth – so too is there the possibility that the soya – animal feed – poultry cross-country value chain can start putting pressure on member states. If several value chains took up the call it is possible that lobbying pressure might elicit some change driven from the bottom up.

In addition to breathing new life into old issues through a new industrialisation champion for logistics issues, the industrialisation angle could also support an effort to upgrade logistics and transport industry players and their interaction with the public sector. This would dovetail with the increased role of exporting and importing firms envisaged above, but would necessitate improved organisation and involvement from private sector logistics and transport players. The World Bank LPI Survey (World Bank, 2007) analysis suggest that logistics reforms should allow for an integrated approach focusing not only on the interaction of infrastructure and public/private services, but importantly to also focus on addressing co-ordination failures and identifying constituencies for reform (truckers, clearing agents, public agencies, exporters). The survey stresses that reforms need to be comprehensive and that correcting only one process will not result in tangible benefits. For example, it suggests that facilitation initiatives along a particular transport corridor such as a one stop border post will not help logistics performance unless the behaviour of the public sector agencies and private sector users of the border facility also change.

Improving industry association depth is an obvious suggestion with stronger logistics and transport associations being able to support value chain firm efforts in removing cross-cutting logistics issues especially at border posts. It would also offer an additional source of lobbying as the industry itself could lobby member states for improvements both on their own behalf and on behalf of their clients.

An additional reason to look at strengthening logistics providers associations and the interface between such association and value chain producers is that problem solving is one of the key value-added services of large, sophisticated logistics operators. For example, in discussing return loads of South African trucks from Zambia after dropping off grocery deliveries for retail shopping companies, all the big logistics companies interviewed suggested easy options to deal with the mismatch between the returning flatbed trucks with only curtains on the side and the need to move

bulk soya oilcake to South Africa. One company said they could negotiate and assist Zambian soya growers to access affordable bulk bags for packing their oilcakes, such that they could be transported to South Africa on flatbeds. Another company suggested that it could operate a bulk bag packing and storage facility on behalf of Zambian soya farmers which could be used by anyone wishing to take advantage of backhaul opportunities on flatbeds. The point being raised is that the value add of logistics firms and logistics associations can be maximised and harnessed in conjunction with the needs of particular value chains if institutional depth, co-ordination and inter-sectoral discourse are synergistically and systemically supported.

To conclude, the tasks and sub-activities listed under logistics in the current SADC Industrialisation Action Plan (2017) call for the identification of soft and hard infrastructure projects which will result in quick and tangible improvements. Ideas for such projects which could be the basis for additional research and thinking include:

- Setting up (and/or deepening) member state private sector logistics service providers associations.
- Setting up a regional private sector logistics service providers association (made up of the member state associations).
- Setting up value chain representative lobbying groups.

The purpose of these three intervention would be to: i) support the co-ordination of value chain representatives needs and the supply possibilities that can be provided by logistics players – bringing the two sectors together; ii) create a single voice and single argument for relevant member states on border post improvements required and the payoff for such improvements; and iii) enable politicians to be able to counter rent-seeking behaviour at the coal face because of the tangible payoff of improving border post performance.

A second possible practical project would be to resuscitate the (now defunct) Transzam information system – but to do it at a regional scale for all member states. Tranzam was a web-based transport information system which allowed interested parties to submit their loads to be transported. It operated as a portal for backhaul supply and demand showing both transporters with empty trucks and producers with loads that required moving. Registered users were notified via email of opportunities. The system was created using EU technical support and funding and was trademarked by the Zambian National Farmers' Union, which as the operators bore no legal liability or responsibility for the accuracy, adequacy or completeness of any information posted on the portal (Imakando 2017).

As mentioned in Section 3, all large logistics companies operating in the region overcommit to loads to ensure their trucks are always full (or at least always have the *opportunity* to be full) on return legs. To deal with these overcommitments, they subcontract to approved transporters. The approval process is lengthy and detailed – as even if the logistics company has sub-contracted a load it is the parent logistics firms that will ultimately be held accountable by the client. Each big logistics company runs portals in each member state which advertise return loads to approved subcontractors, thus operating along similar lines to the Transzam portal but on a private basis.

A SADC run portal would probably only be used by smaller producers who do not have contracts with the large logistics firms or larger transport and haulage companies. Similarly, on the supply side,

most of the transporters who would use such a platform would be smaller, less formal transporters who do not qualify for large logistics firm subcontracting opportunities. The portal would thus service the smaller, less formal, lower end of the market both for producers needing to transport goods and transport suppliers. This nevertheless remains a viable and large market and a portal of this type would assist with backhaul problems faced by smaller transport companies. The portal would also be a useful resource to meet seasonal variations in demand such as when the tobacco crop from Zimbabwe needs to be delivered to port or when supplies of fertiliser to Zambia need to be delivered just before the planting season.

Finally, to reduce standing times at border posts – prioritised interventions could include:

- The construction and *utilisation* of more dedicated lanes entering in to and exiting from a border post. Dedicated lanes for empty trucks, trucks with pre-cleared loads and maybe trucks with specific value chain products would make a serious dent in reducing standing times. Interviewees point out that at some of the newer one stop border facilities such lanes were initially dedicated for specific use but have now been closed and non-differentiated commercial lanes are now in use, leading to increased queuing times.
- Better and sufficiently sized and maintained generators at every border post to ensure that posts have the necessary electricity to use their internet and computer systems at all times. Upgrading telecoms infrastructure and LAN (local area) and WAN (wide area) networks is a priority to avoid backlogs which take weeks to clear when these systems go down.
- Better and more co-ordinated training of border officials so that each individual step of the border process is more efficiently and effectively performed and so that multiple agency functions and processes are streamlined and synchronised to minimise time delays. Once a streamlined and optimised modus operandi is established, officials should be supported in not changing the said process. Training must include risk factors for physical inspections as the current random approach to physical inspections is viewed as a major issue at all border posts.

REFERENCES

African Development Bank, 2013. Understanding the Barriers to regional Integration in Africa.

Arndt, C., and Roberts, S., 2017. Key Issues in Regional growth and Integration in Southern Africa, Forthcoming.

Arvis, J.P., 2007 in Connecting to Compete: Trade Logistics in the Global Economy 2007, Washington.

Arvis, J.P, Raballand and Marteau, 2007. Assessing Regional Integration in Africa IV: Enhancing intra African trade, United Nations Economic Commission for Africa.

Byers B., and Vanheukelom J., 2014. What drives regional economic integration: Lessons from the Maputo Corridor, European centre for development Policy management, Discussion paper No. 157, February.

CCRED (Centre for Competition, Regulation and Economic Development), Das Nair, R., and Chisoro, S., 2016. The Expansion of regional supermarket chains and implications for local suppliers, UNU Wider Working Paper 2016/169.

CCRED, 2016. Reducing transport costs to spur regional growth in Southern Africa, UNU Wider Research Brief 7/16.

CCRED, 2017. Note on the Poultry Industry.

CBRTA (Cross Border Road Transport Agency), 2014. Annual Report 2014.

CBRTA, 2015. Annual State of Cross Border Operations Report 2015.

CBRTA, 2016. Annual Report 2016.

CBRTA, 2017. Annual State of Cross Border Operations Report 2017.

Dacher, 2015. Insight into Logistics in Africa and Cross Border Trade in 2016. Dachser Intellegent Logistics newsletter.

Erasmus, G. (2015). The New Protocol for the SADC Tribunal: Jurisdictional Changes and Implications for SADC Community Law. Stellenbosch: tralac.

Fessehaie, J., 2015. Regional Industrial research project: Case study on mining capital equipment value Chain in South Africa and Zambia, CCRED Working Paper 1/2015.

Gausch, J.L., 2003. Logistics as a Driver for Competitiveness, Americas Competitiveness Forum 5.

Hartzenberg T., Katenga P., 2015. National Policies and Regional Integration in SADC, UNU Wider Working Paper 2015/056.

Hartzenberg T., Katenga P., 2015. National Policies and Regional Integration in SADC, *Under Review*, Development Southern Africa.

Havenga J.H, 2011. Trade facilitation through logistics performance, University of Stellenbosch.

Imakando, M., 2017. Initiatives to Increase Trade and Regional Industrialisation.

Korinek, J., and Sourdin, P., 2011. To what extent are high quality logistics services trade facilitating? OECD Trade Policy Working Paper No. 108.

Kerney, A.T., 2016. Price Waterhouse Coopers, 4 Scenario's Emerge out of Major Transport and Logistics Industry Shifts, slide presentation.

Ledger, T.M., 2017. Agricultural Input regional value chains in Southern Africa: South Africa, Mozambique, Tanzania and Zambia, Forthcoming.

Limoa A.J, and Venables, P., 2008. Infrastructure, Geographic Disadvantage, Transport costs and Trade, London School of Economics and CEPR working paper.

MacKellar L., Wörgötter A., Wörz J. (2002) Economic Growth of Landlocked Countries. In: Chaloupek G., Guger A., Nowotny E., Schwödiauer G. (eds) Ökonomie in Theorie und Praxis. Springer, Berlin, Heidelberg.

Mutambara, T., 2008. Regional Transport Challenges, tralac.

Ncube, P., Roberts, S., and Zengeni, T., 2016. Development of the animal feed to poultry value chain across Botswana, South Africa and Zambia, UNU Wider Working paper 2016/2.

Raballand, G., Relas, S., Beuran, M., Isik, G., 2012. Why Does cargo spend weeks in SSA Ports, Lessons from 6 countries, World bank, Washington.

Rantanathan, R., and Foster, V., 2011. ECCAS's Infrastructure: A regional Perspective, Policy research Working Paper, World Bank, Washington.

Roberts, S., 2017. Note on the Poultry Industry, CCRED.

SADC, 2013. Desk Assessment of the Regional Indicative Strategic Development Plan'. SADC Secretariat: Gaborone.

SADC, 2017. Industrialisation Action Plan. SADC Secretariat: Gaborone.

SADC, 1998. Protocol on Transport, Communications and Meteorology. SADC Secretariat: Gaborone.

Teravaninthorn S., and Raballand G., 2009. Transport Prices and Costs in Africa: A review of the main international corridors; World bank, Washington.

UKAid, 2014. Advancing regional Integration in Southern Africa.

USAID, 2011. Road Freight Transport Services Diagnostic Study. Technical Report produced by N.Ward and E Baretto.

Vilakazi T., and Paelo, A., 2017. Understanding intra regional transport. Competition in road transportation between Malawi, Mozambique, South Africa, Zambia and Zimbabwe, UNU Wider Working Paper 2017/46.

Wilson J.S., Mann C.L., and Otsuki, T., 2003. Trade Costs and facilitation in APEC and ASEAN: Delivering the Goods.

World Bank 2007. Connecting to Compete: Trade Logistics in the Global Economy 2007, Washington.

World Bank 2009. Connecting to Compete: Trade Logistics in the Global Economy 2009, Washington.

World Bank 2010. Connecting to Compete: Trade Logistics in the Global Economy 2010, Washington.

World Bank 2012. Connecting to Compete: Trade Logistics in the Global Economy 2012, Washington.

World Bank 2014. Connecting to Compete: Trade Logistics in the Global Economy 2014, Washington.

World Bank 2016. Connecting to Compete: Trade Logistics in the Global Economy 2016, Washington.