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The causes of high intra-regional road freight rates for food and commodities in Southern Africa

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ABSTRACT

This paper focuses on key areas for reducing transport costs in Southern Africa emerging from recent research on cross-border freight between Malawi, Mozambique, South Africa, Zambia and Zimbabwe. We consider the impact of competition, border delays and lack of return loads on transport rates which could be reduced significantly through increased availability of return loads for transporters, linked to growing industrial capacity in each country. Furthermore, increased competition and reducing delays for transporters contributed to a large reduction in transport rates between Lusaka and Johannesburg, with similar effects from Malawi. Margins charged in refrigerated transport are high due to low levels of rivalry and lack of return loads. Measures to reduce border constraints and enable greater rivalry between transporters from different countries could have a downward effect on transport rates in the region which are shown to be above benchmarks for efficient transport.



KEYWORDS

Southern Africa; road freight; transport; cross-border; regional integration; competition

1. Introduction

In some cases, the only difference between the price of deep sea imports landed in South Africa and those goods from neighbouring countries is the high overland transport cost between Southern African countries ('the region'). Furthermore, the share of South Africa's diversified manufacturing exports going to SADC (Southern African Development Community) has risen to around 30% in 2015 from 15% in 2005.¹ The vast majority of goods, and 70–90% of agricultural goods in Africa (World Bank, 2015), are transported using trucks. As such, the costs of road transport are especially important to understand in the context of regional integration, urbanisation, and opportunities for production and supply across a wider regional market linked to rising food consumption and incomes in the region.

The SADC Industrialisation Strategy and Roadmap recognises high transport costs and inefficiency in logistics systems as constraints on the development of cross-border value

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¹Excluding basic metals and chemicals. Quantec data.

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chains (SADC, 2015). However, it underplays the importance of efficient and affordable road freight to the success of such a strategy. This paper focuses on key issues relating to reducing transport costs in Southern Africa emerging from recent research on cross-border freight between Malawi, Mozambique, South Africa, Zambia and Zimbabwe.² Specifically, we consider the impact of competition, border delays and a lack of return loads on transport rates.

The paper assesses the key determinants of high cross-border road freight prices within Southern Africa, including the roles of regulation and competition bottlenecks. We distinguish between rates for perishable food and commodity transportation by truck between key areas of production and consumption within the region which is most relevant for understanding inter-regional trade and development. The assessment does not consider freight to and from ports for overseas exports and imports. We focus on freight between Harare (Zimbabwe), Johannesburg (South Africa), Lilongwe (Malawi), Lusaka (Zambia) and Maputo (Mozambique).³

We show that rates could be reduced significantly with increased availability of return loads for transporters in the region, linked to growing industrial capacity in each country. The implications for regional integration and industrial development in Southern Africa are therefore assessed. Increased competition and reducing delays at border crossings for transporters contributed to a large reduction in transport rates between Lusaka and Johannesburg, with similar effects from Malawi also. Margins charged in refrigerated transport are high due to low levels of rivalry and lack of return loads, amongst other factors. Measures to reduce border constraints could have an immediate downward effect on transport rates in the region which are shown to be above our benchmark for efficient transport.

The insights on each market, as well as transport rates and costs are drawn from information gathered in 33 detailed interviews of transport companies and brokers, industry associations and users of transport services including grocery retailers conducted in each country in 2015. The underlying research relied on verifying and triangulating information from desktop research and interviews in each country to inform the key findings, particularly given a lack of reliable, comparable transport cost and price data across the countries.

The paper is structured as follows: we briefly review the main issues identified in previous studies on transport rates and trade in Africa and the region, and highlight the contribution of this paper to these debates. We then describe the structure of markets in regional transport before presenting the recent evidence on road transport prices and costs and the impact of greater competition in section 4. Section 5 assesses the main additional causes of high freight rates, Section 6 draws together the main findings and implications for industrial development and integration. Section 7 concludes.

2. Transport costs, infrastructure and drivers of transport rates

Poor road infrastructure, high trade barriers and high transport costs constrain economic development in Africa and have undermined the formation of integrated regional markets

²This paper is largely based on two working papers as indicated.

³There is reference throughout the paper to routes to and from Maputo in Mozambique although this is not a central focus of this paper. Furthermore, information regarding Mozambique is drawn from interviews in the other countries with market participants operating on Mozambique routes.

(Mbabazi et al., 2008; UNCTAD, 2013; UNECA, 2013). Given the historical negative economic impact of poor road networks, some estimates show that interventions to upgrade and integrate road networks in Sub-Saharan Africa could lead to an expansion in overland trade of around \$250 billion over 15 years based on conservative assumptions (Buys et al., 2010). Importantly, the increase in trade and other economic benefits such as employment is expected to far exceed the costs of upgrading infrastructure (Buys et al., 2010). Development of quality infrastructure can also contribute to increased productivity and output, which has effects in terms of lifting local and rural economies and in some cases contributes to reducing inequality and poverty (Calderón & Servén, 2008).⁴

Domestic economies in the region are relatively small and characterised by high entry barriers, concentration and anticompetitive conduct in key industries (Roberts et al., 2017). It is therefore important to consider that high transport costs, trade barriers and protectionist measures can reinforce the market power of incumbent firms and entrench concentration in local markets (Gal, 2001; World Bank-ACF, 2016).

Prices for road freight are lower in Southern Africa than other regions in Africa although major routes are highly profitable suggesting a large margin between transport prices and costs (Teravaninthorn & Raballand, 2009). Some of the key costs such as labour and vehicles are lower relative to developed and developing countries, although fuel prices may be comparable or higher (Teravaninthorn & Raballand, 2009; Foster & Briceño-Garmendia, 2010). Improvement in road infrastructure contributes to better outcomes, however, road infrastructure on major cross-border trucking corridors is generally considered to be adequate in Southern Africa (Lall et al., 2009; Teravaninthorn & Raballand, 2009). Instead, high costs are largely driven by regulatory and competition constraints (Teravaninthorn & Raballand, 2009; Foster & Briceño-Garmendia, 2010; Gwilliam, 2011). Improving the efficiency of border procedures, addressing bottlenecks and enhancing the efficacy of administrative systems are critical areas for intervention (Byiers & Vanheukelom, 2014). Measures to increase vehicle utilisation and cut travel times by reducing delays at border posts also contribute (Foster & Briceño-Garmendia, 2010; JICA, 2010; Byiers & Vanheukelom, 2014). Delays at border posts, multiple stoppages, corruption, over-regulation and time spent in truck queues actually increase transport rates on cross-border routes by 10–30% even though operating costs are not necessarily higher than in Europe, which is in line with our own assessment (Foster & Briceño-Garmendia, 2010).

Arrangements in transport should be understood as part of integrated value chains where government policy and market power at one level of the value chain can affect competitive outcomes in transport. For example, in Malawi, Tanzania and Zambia the structure of government fertiliser subsidy programmes and anticompetitive arrangements in fertiliser trading have restricted competition in transport (Ncube et al., 2017). On the other hand, regulation to ease entry in trucking and open up to competition from different countries reduced trucking rates on certain cross-border routes from Zambia (Raballand et al., 2008; Ncube et al., 2017).

We extend the analysis in previous papers to include recent information on refrigerated transportation which has generally not been assessed. This refers to transportation by refrigerated container or trailer ('reefer') of perishable goods (focusing on food) including

⁴There are important caveats in terms of measurement and heterogeneity, usefully outlined by Calderón & Servén (2008).

fresh, frozen or chilled goods primarily. This aspect of freight has become increasingly important as the trade and consumption of imported perishables increases in the countries considered. The quality and efficiency of logistics systems is especially important in refrigerated transport given time- and temperature-sensitivity (Zamparini et al., 2011).

3. The structure of markets and competition between transporters

3.1 Non-refrigerated transport

We focus here on characterising forwarders/brokers and truckers and their links to customers in the region based on the interviews conducted. Trucking companies with less than 10 vehicles are considered small and the largest firms have fleets of more than one hundred trucks. The largest trucking and forwarding firms typically have depots and operations in each country and are largely 'regional' (rather than limited to a single country) in their strategies and operations. For example, Imperial Logistics from South Africa is vertically integrated throughout the logistics chain either directly or through various subsidiaries spread across the region, leveraging capacity in terms of fleet size, warehousing capacity and management systems to win major contracts with customers. Large operators of this nature carry far greater bargaining power with customers than smaller operators, given their broad service offering which customers value. This often means that corporate customers may pay more for these services, although this is balanced by the fact that transporters report charging reduced rates if it means they can secure longer term contracts and higher volumes from a customer.

Forwarding agents and brokers are generally concerned with coordinating handling, off/loading, customs and port clearance, warehousing, documentation, sea freight and transportation for clients. The large forwarding firms typically have long-standing relationships with large transport groups that tend to specialise in road transport rather than the provision of related services. There are also small 'briefcase' operators that typically service one-off importers and exporters, although they sometimes compete for larger clients through undercutting on prices.

The structure of markets for forwarding and trucking differ by country. There are specific features of each market in terms of major participants and concentration which affect competitive outcomes, some of which are considered below:

- (a) In Malawi, there are around 150 registered agents although only eight of these can be considered large, diversified operators with multinational presence. There are less than 10 domestic firms with large cross-border transport operations, including AS Investments (over 700 trucks specialising in dry goods and break bulk), Siku Transport, J&J Africa (over 1000 trucks across the region), R Gaffar Transport and Trans-tech.
- (b) Since the early 2000s there has been consolidation of the largest transport companies in Mozambique from 72 in 2003 to around 20 major firms being represented by the main industry association of large transporters (ASTROCAMA) in 2014, and there is extensive subcontracting to smaller operators (Meeuws, 2004; VillageReach, 2014). The largest firms in road transport such as Lalgy, SuperSteel and J&J Africa (based in Mozambique) have fleets which are close to or exceed 1000 vehicles. Increasingly

- Mozambican transporters have contested routes to Malawi in particular through offering cheap rates to the Beira and Maputo ports, whereas South African and Zimbabwean transporters had a stronger presence in the early 2000s (Meeuws, 2004).
- (c) The South African market comprises a relatively large number of transporters of various sizes, although there are around seven main logistics companies in the industry: namely, Imperial Logistics, Value Logistics, Barlow World, Unitrans, Super Group, DHL and Cargo Carriers (Vilakazi & Paelo, 2017a). The largest companies are vertically integrated with operations throughout Southern Africa. The primary industry association, the Road Freight Association, has approximately 450 members and it is estimated that there are around 16 000 goods vehicle operators (Vilakazi & Paelo, 2017b).
 - (d) In Zambia brokers and large transport companies control access to the main contracts in copper, chrome and other minerals for exportation. The main truckers' association has over 60 members comprising the largest transporters with total vehicle capacity of approximately 2100.
 - (e) In Zimbabwe brokers control access to the main contracts in tobacco and chrome, and subcontract to preferred transporters. Preferred transporters are in most cases the major transport firms including Cargo Carriers, GDC Whelson, J&J Africa, Leo Pack and Truck Africa (Imperial group). The main truckers association has around 90 members accounting for 5000 vehicles.
 - (f) The main regional or multinational firms operating in forwarding include: Bridge Shipping, Manica, Bollore Africa, Barloworld, UTI, CWT-Aquarius, Alliance. Trucking companies with the largest operations across the region include: Bridge Shipping, J&J Africa, Barloworld, GDC Whelson (Super Group), AS Investments, Imperial Logistics, Unitrans and Trans-tech.

In each country, there is a far greater number of smaller operators relying on subcontracting by large companies to access loads from major exporters. This level of the market is not concentrated and entry barriers are generally surmountable. However, there is a high rate of exit given that smaller transporters tend to use older vehicles and invest less in maintenance, IT systems and fleet redundancy, and typically do not achieve efficiencies in their operations. This means they often offer weak competitive constraint to large companies other than by undercutting on price.

3.2 Refrigerated transport

Markets for refrigerated transport outside of South Africa are highly concentrated with few large operators. In Malawi, for example, Bollore Africa is the largest broker involved with refrigerated loads (through subcontracting to trucking companies), in a concentrated trucking market where there are only four reputable trucking companies that service refrigerated loads. High concentration, low demand and high entry costs in Malawi result in rates which are relatively high for reefer trucks. The same generally applies in the Zimbabwean market for refrigerated transport wherein Lonrho Logistics, which is the only major regional player, operates a reefer fleet of less than 30 vehicles in competition with South African operators such as HFR with just under 200 vehicles. The South African market was estimated to have more than 7000 refrigerated vehicles in 2011 (although the

majority consist of small vehicles less prominent in cross-border transport) (Oppelt et al., 2015). HFR forms part of a category of large specialist trucking firms that operate primarily in the transportation of perishables in the region. These companies operate in close commercial relationships with the larger logistics operators such as Imperial, Vector, Value, Bidvest, Unitrans and Hestony that offer one-stop, bundled services including warehousing and supply chain management to large food producers and retail groups.

Customers, such as retail chains, with frequent and large loads prefer to contract with a single major logistics provider to minimise transaction and administrative costs. Large multinational forwarding and clearing firms specialise in broker services, but integrate vertically into trucking and storage through subcontracting relationships with preferred transport companies to provide comprehensive services. However, this also means that small- and medium-sized truckers cannot participate in large contracts other than through subcontracting arrangements which are said to significantly disadvantage them due to low margins earned.

Small operators charge 10–15% less than the large operators given lower overheads and expenditure on maintenance of vehicles. However, customers with perishable goods have strict requirements in terms of maintaining the correct temperature and cleanliness of fridge units. Grocery retailers in the different countries indicated that they valued reliability and timeliness (transit times) most in evaluating transporters, over flexibility, frequency and loss and damages. As such, service-level standards are fixed in the terms of contracts with retailers, which apply to any subcontracted firms also. Large clients will pay more for a reliable and comprehensive service, and as a result transporters promote themselves on the basis of reputation, low accident rates, financial position, management structures, and track record. Many small- and medium-sized firms often lack a strong track record which makes it difficult to win large retail customers.

The requirements of retail groups are complex and in most cases extend beyond the capabilities of transport or forwarding companies. For example, Manica, which is one of the largest multinational forwarding agents in the region, has chosen not to compete for forwarding of FMCG (fast-moving consumer goods) and perishables partly because the requirements in terms of staff training, expertise and operational systems are extensive in order to fully integrate with large retailers. These requirements can constitute a barrier to entry for smaller rivals combined with significantly higher entry costs on refrigerated vehicles. Outside of South Africa, the level of demand often does not justify the entry and maintenance costs incurred, even when second-hand vehicles are purchased for refrigerated transport, such that markets are highly concentrated.

4. Rates and costs for road freight and the impact of competition

Transport rates and costs for reefer and ordinary transportation are drawn from the detailed interviews.⁵ These rates are then compared to benchmarks defined for efficient transport in the region and from previous studies.

⁵In the underlying research study, respondents were asked based on standardised interview guides to indicate the average rates paid or charged in 2015 for the transportation of a particular type of good, for example, perishable items, by city pairing where applicable. Responses were given in US Dollars, or in local currency terms in which case the rates were converted using annual average exchange rates. Unless otherwise stated, rates included in tables are based on an average of the average rates stated by respondents.

4.1 Road freight rates

In [Table 1](#) the average rate charged for trucking on each city-pair route is reflected for ordinary flatbed trucking (28–30-ton equivalent trucks, non-refrigerated) typically used for commodity transport and non-specialised loads. The rate is the amount paid to the trucking company for the trip also reflected in US dollars per ton per kilometre (tkm) which is the unit price of transport. The rates include only trucking-related costs such as fuel, insurance, expected tolls, driver and parking fees and petty cash. In the table the average rate refers to the average of the import and export rates charged for 2015. For example, on the pair ‘Lusaka-Johannesburg’, the import rate is for the leg from Johannesburg to Lusaka, and the export rate is for the corresponding return leg to Johannesburg.

A few important observations can be made. In absolute terms, import rates to Lusaka, Harare and Lilongwe (each in landlocked countries) are always higher than export (out-bound) rates. In the case of Lusaka-Johannesburg the import rate is around double the rate for the corresponding outgoing leg, which is largely driven by the lack of return loads for trucks once goods have been delivered. Truckers therefore factor in the costs of returning the truck (often empty) to the city of origin. The average rate per tkm for the relatively shorter distanced Lusaka-Harare route is almost double that on any of the other routes, which reflects economies of distance over longer distances as well as competitive dynamics on the route as discussed below.

In [Table 2](#) the rates for refrigerated transport charged for individual legs between cities for 2015 are shown. We focus on the rate for trips originating in Johannesburg to the other cities as South African imports of perishables from the other countries are negligible. The domestic transport rate between Johannesburg and Cape Town in South Africa is also included here as a comparator for efficient transport, as discussed below.

The total prices charged for trips using refrigerated transportation are significantly higher than rates for non-refrigerated transport. The difference partly reflects higher energy costs in maintaining cool temperatures in the fridge unit and higher investment and maintenance costs associated with refrigeration units. Transport companies generally charge high mark-ups for refrigerated transportation and low demand outside South Africa has made it unviable for many firms to remain in the market, resulting in high levels of concentration. Compared to Johannesburg-Cape Town, cross-border rates will be higher to reflect additional hassle and risk borne by the transporter, including higher costs of insurance and border delays (which imply additional costs for refrigeration, for example).

4.2 Assessing against benchmarks for efficient transport and over time

Detailed information on costs is generally difficult to access and compile across different companies. As such we consider various benchmarks of what efficient transport rates are in the region and compare the observed rates above to these. This approach allows for an assessment of the relative levels of competition and efficiency on different routes as well as an evaluation of different factors which may drive differences with benchmarks.

For non-refrigerated transport we consider a benchmark rate for efficient transport in the region of \$0.04 per tkm for several reasons. This rate is in line with the lower bound of

Table 1. Average non-refrigerated truck rates, 2015.

Route	Distance (km)	Export rate (\$)	Import rate (\$)	Average rate (\$/ton/km) & [range]
Lusaka – Harare	495	1500	1800	0.11 [0.10–0.12]
Lusaka – Johannesburg	1576	1800	3660	0.06 [0.04–0.08]
Harare – Maputo	1286	1350	1950	0.04 [0.03–0.05]
Lilongwe – Johannesburg	1863	2100	3950	0.06 [0.04–0.08]

Note: Rates relating to 28- to 30-ton flatbed tri-axle truck and equivalent, based on average of import and export rate charged.

Source: Author's own calculation based on information from various interviews.

Table 2. Average refrigerated truck rates per leg, 2015.

From	To	Distance (km)	Total rate (\$)	\$/ton/km
Johannesburg	Harare	1121	4498	0.13
Johannesburg	Lilongwe	1863	5040	0.09
Johannesburg	Lusaka	1576	4548	0.10
Johannesburg	Cape Town	1398	2352	0.06

Notes: Rates for a 40-ft refrigerated container or a reefer container loaded on a 30-ton flatbed truck.

Source: Author's own calculation based on information from various interviews.

rates for the Lusaka-Johannesburg route which is considered by transporters and in previous studies to be the most competitive in Southern Africa with high demand and several different trucking companies from South Africa, Zambia and Zimbabwe competing to supply services (Raballand et al., 2008; Teravaninthorn & Raballand, 2009). Given current constraints in terms of border delays, we argue that this rate could be even lower than the average \$0.06 per tkm and closer to international comparators. For example, transport rates in Pakistan, Brazil, United States, China and France, where transport is generally considered to be more efficient, were in the range \$0.02–0.05 per tkm in 2007 (Teravaninthorn & Raballand, 2009; Rashid & Minot, 2010).⁶ Rates of \$0.04 per tkm and below could therefore be considered as ‘target’ rates for efficient transport in the region if certain inefficiencies are addressed.

In refrigerated transport we take the rate charged for the route between Johannesburg and Cape Town as the guideline efficient rate, at \$0.06 per tkm. This rate is indicative of rates on a highly competitive route with multiple operators, absent any additional risks associated with cross-border transit and delays. Firms in the region with lower overhead costs, lower labour costs and lower fixed investment costs (purchasing second-hand, imported vehicles) could potentially charge rates even lower than this and as such it is likely to be a conservative estimate.

In terms of ordinary trucks, the average rates observed in the region are marginally above the benchmark applied, and the rate for Lusaka-Harare is nearly three times the benchmark. For Lusaka-Johannesburg and Lilongwe-Johannesburg the import rates are double the benchmark rate, even though export rates are in line. This suggests the extent to which transport rates could come down on these routes – the lower export rate accounts for broadly the same distance, costs and border crossings when returning to Johannesburg with a load as the import rate although a lower rate is charged. Effectively, rates on the import leg from Johannesburg could be reduced over time to align

⁶There are almost no recent international studies with reliable comparators that could be applied in this case, or for refrigerated transport.

with the benchmark level or below. Importantly however, transporters stated that they are generally only willing to charge less on the outgoing leg if they are guaranteed a return load.

The Harare-Maputo route has slightly different competitive dynamics between operators. The rates are very competitive which is due to aggressive rivalry from Mozambican transporters on the route.

Total rates for Lilongwe-Johannesburg and Lusaka-Johannesburg are similar despite a marginally longer distance travelled. The route from Johannesburg to Lilongwe has three border crossings including via Zimbabwe (passing through Beitbridge which is the most constrained border post) and Mozambique over a significant transport distance, compared to two on Lusaka-Johannesburg. This suggests that the Lilongwe-Johannesburg rate should be higher in general, although increased competition has had a downward effect on rates.

Ncube et al. (2017) assess 2014 rates in Southern Africa which can be compared to the above rates for Lusaka-Johannesburg. Combined with information from other transporters, the rate from Johannesburg to Lusaka in 2014 was on average \$165/ton (or \$0.105 per tkm). The price charged for the same route in 2015 appears to have come down further by around 26% to \$122/ton (or \$0.08 per tkm). This is consistent with the findings that routes to and from Zambia (Lusaka) have become more competitive and cheaper in recent years due in part to greater rivalry from foreign transporters (some of which have subsidiaries registered in Zambia) (Raballand et al., 2008; Ncube et al., 2017). However, there are exchange rate effects and decreases in fuel prices during 2015 that have an important impact. Export rates from Zambia to South Africa appear to have also come down from around \$110/ton in 2014 (Ncube et al., 2017) to just below \$70/ton by 2015.

Similarly, Lall et al. (2009) estimated rates from locations in Malawi to international destinations in the region to be on average \$0.08 per tkm. However, the rate from Lilongwe to Johannesburg has been halved from around \$149/ton based on Lall et al. (2009) to \$70–75/ton in 2015. Two important factors are considered to have resulted in this change on Malawian routes. The first is the increasing loads from South Africa to Malawi, as well as the availability of backhaul of Malawian tobacco exports going to the Durban port directly (via Johannesburg) and to Johannesburg for processing in some cases. Furthermore, the increased presence of foreign transporters in general on Malawian routes has led to rates being competed down. Fuel rates in Malawi have also decreased significantly by 2015 which has enhanced the competitiveness of Malawian transporters that operate on these routes.

For refrigerated trucking a very high margin is applied on most of the routes when compared to the benchmark. For all of the cross-border routes originating in Johannesburg, the mark-ups over the benchmark range from 50% (for Johannesburg-Lusaka which is considered to be more competitive) to 117%.

In thinking about the questions set out initially, the data above show that transport prices particularly on the export leg from South Africa are high relative to benchmarks for efficient transport and international standards. However, the assessment also demonstrates that routes where there is a greater level of rivalry tend to have lower transport rates, other things equal.

5. What are the causes of high road freight rates in Southern Africa?

High rates on certain routes cannot be fully explained by costs associated with transport and we focus here on additional contributors to high rates. While fuel prices are relatively high in Malawi and Zambia (currently accounting for 40–50% of operating costs on average), these have come down recently yet margins on some routes remain high. We consider the effect of an imbalance in trade flows and border delays.

5.1 *The effect of an imbalance in production and trade*

South African exports, particularly of perishable goods, are not matched by sufficient return flows from Malawi, Zambia and Zimbabwe which is exacerbated by the limits on the types of goods that can be carried on reefers. This situation may change as Zambia and other countries gradually increase productive capacity and diversify towards exporting various processed and manufactured items. For example, Zambia's non-copper merchandise exports into the region including electrical equipment and machinery, sulphur, animal feed and residues from the food industry have already grown substantially since the early 2000s with potential for further growth in some areas such as sugar exports (World Bank, 2014).

South African exports of perishable goods to Malawi and Zambia have almost doubled since 2010 while those to Zimbabwe have slowed but remain sizeable. For Zambia, the most significant growth has been in fruit and vegetable imports whereas for Malawi growth is led by increases in imports of meat and fruit products.

There are flows of commodities from Zambia in particular (largely copper) that are transported either to locations in South Africa for processing or to Durban. Copper exports from Zambia present an opportunity for obtaining backhaul from South Africa. The same applies to tobacco exports from Malawi, although of course these are more seasonal. These factors contribute significantly to the lower rates available on the Lusaka-Johannesburg and Lilongwe-Johannesburg routes. Compared with the other routes assessed, the greater availability of loads in both directions also attracts truckers to the Lusaka-Johannesburg route.

Truckers estimate that rates charged for the return leg to Johannesburg are on average 70% of the outgoing rate for transportation of non-refrigerated loads. The examples of Lusaka-Johannesburg and Lilongwe-Johannesburg show that the differences can be far greater and up to half of import rates from South Africa. Taking a conservative approach, the total rate from Johannesburg to Lusaka of \$3660 could be brought down to around the average of the import and export rate or 70% of the outgoing rate (at \$2600) if return loads were regularly available, other things equal.

5.2 *The effect of border delays*

Each route is affected by border delays arising from the government administrative processes or incomplete information from the customer or broker. There have been significant improvements, however. For example, the introduction of a one-stop border post (OSBP) at Chirundu (between Zambia and Zimbabwe) has continued to increase efficiencies since 2009 and has had a downward effect on rates (Curtis, 2009; TradeMark,

undated). The effective implementation of pre-clearance of goods has been an important contributor particularly because sealed, pre-cleared loads are able to proceed through the border with minimal inspection delays. Freight companies with good IT systems and forwarding capabilities are able to use pre-clearance to their advantage. On the other hand, the expected transit time through Beitbridge (between South Africa and Zimbabwe) is two days (Curtis, 2014), partly because goods are effectively required to be cleared on the Zimbabwean and South African side. Other main constraints identified through the interviews are as follows:

- Clearance systems between South Africa, Zambia and Zimbabwe do not interoperate and do not have connectivity with one another, although it is apparently technically possible to do so. Bottlenecks also arise when leaving the SACU (Southern African Customs Union) countries due to the use of different electronic systems, tariff structures and coding of certain products for tax and duty purposes.
- Zambia does not give preference to transporters of time-sensitive goods although we understand that this is to be addressed.
- Some border gates, such as Chirundu (between Zambia and Zimbabwe) do not operate on a 24-hour basis which implies queues and parking fees even for time-sensitive refrigerated transport. Authorities are apparently working towards extending hours gradually.

Byiers & Vanheukelom (2014) found that delays at border crossings can cost up to \$300 a day for an 8-axle truck. In 2015, delays at the border were estimated by transporters to cost at least \$400 a day or \$13/ton. This provides a useful benchmark for understanding the costs incurred by a truck operator including additional driver time, petty cash, parking fees and the opportunity costs of servicing less clients due to longer roundtrips. For reefers, there are additional refrigeration costs incurred and possible obsolescence of goods.

Removing the impact of the typical delay of two days on the one-way rate charged from Johannesburg to Lusaka of \$3660 or \$122/ton (Table 1) could have a large impact, other things equal. Based on \$26/ton for two days' delay the rate could decrease to \$96/ton (\$0.06 per tkm) which is a 21% difference and closer to the efficient benchmarks identified.

5.3 Summary of impact of increased competition, delays and availability of return loads

More intense competition between transporters in combination with other factors on the route from Johannesburg to Lusaka has seen rates decline from \$165/ton to \$122/ton (a reduction of approximately \$0.027 per tkm or 26% on this route).

Eliminating a further two days of delay could bring rates down to around \$96/ton or \$0.06 per tkm (a further reduction of \$0.016 per tkm). On this conservative basis, the rate is more in line with the efficient benchmark. The estimated total decrease in rates is \$69/ton, or a 42% saving, although more detailed data is required to assess the full implications which is not currently available in the region.

Rates could be reduced even further with more return loads. Export rates from Zambia to South Africa have also come down from around \$110/ton in 2014 (Ncube et al., 2017) to \$67/ton by 2015. With additional savings from eliminating even one day's delay on this

route, the price on the export leg could be reduced to \$54/ton, and a total reduction from 2014 prices of \$56/ton. To place this in context, the price of a ton of Zambian soya bean in 2015 was around \$400/ton (delivered in Johannesburg), such that the combined saving against the price of the product is approximately 14%. A further reduction could significantly enhance the competitiveness of soya bean landed in South Africa and perhaps increase the viability of exports from Zambia and other countries competing with deep sea imports to South Africa.

6. What are the implications for industrial development and integration?

The rapid internationalisation of South African retail chains such that their supply chains already stretch across borders in the region suggests that the challenges of integration can be addressed (Das Nair et al., 2018). However, this has most likely come at significant cost to the businesses which could be reduced substantially through effective regulation and administration. As discussed, retailers have been prepared to pay more to obtain comprehensive and efficient services. The implications of this are important.

The question is whether regulatory and administrative systems can be used to make efficient transport available for all categories of users. The largest service providers leverage reputation and advanced administrative systems to circumvent bottlenecks, including the ability to place agents at border posts that facilitate documentation and interactions with authorities. Information from the interviews suggests that they also benefit from being able to pass through border posts with limited searches on their vehicles which is a function of established reputations and familiarity with the processes. Through the associations and networks it appears that brokers are also able to influence regulation to favour the largest companies, including strengthening regulations against 'briefcase' brokers that are potential rivals. Coordination between the brokers (possibly covering the whole region) also means that prices and standards for these services are aligned and not reflective of competition.

Small-scale importers and exporters may not have similar capabilities which points to an important role for border agencies and policymakers in easing transit procedures and costs. The discussion in the previous section highlights the impact of enabling greater competition and removing delays at the border (partly from interventions such as the OSBP). The estimated effect on the routes considered was to nearly halve transport rates.

Developing industrial capacity across the region outside of South Africa is likely to lead to lower transport rates overall over the medium- to long-term. Increased access to return loads has a potential effect of reducing rates by around 30% on conservative estimates, although more detailed data is required to assess this further.

Regulation has an important role to play in enhancing competition between transporters. First, competition can be enhanced through enabling entry, licensing and passage of transporters. In Zambia from the late 2000s a focus was placed on ensuring interoperability and harmonising of rules for trade and transit with neighbouring countries including easing permit processes and finalising bilateral agreements (Raballand et al., 2008). For example, a single permit system was introduced for transit between Zimbabwe and Zambia (RTSA, 2014). An important feature of opening up the market was making it possible for foreign operators to compete on Zambian cross-border routes and exposing Zambian transporters to competition from other operators in the region (Raballand

et al., 2008). Deregulation in the early 2000s also led to an influx of new transporters including foreign companies with registered businesses in Zambia. Furthermore, the import duty on second-hand commercial trucks and trucking equipment was apparently lifted in 2008/9 allowing more transporters to bring in cheaper used vehicles (Ncube et al., 2017). Together, these factors have enabled greater rivalry on Zambian routes which is enhanced by the continued improvements in the implementation of the Chirundu OSBP which seems to have now reached a high level of effectiveness since implementation in 2009, despite challenges (Woolfrey & Tshuma, 2013; TradeMark, undated).

There remain other challenges to greater competition in cross-border transport. For example, in Malawi there are indications that the transporters' association has in the past issued recommended rates for transport (Ncube et al., 2017). In addition, there is evidence from the interviews of coordinated behaviour between major brokers in Zimbabwe and Malawi whereby guideline rates are published by the association for different services. In Zambia only a select group of companies receive contracts to transport copper for the large mines. This can be efficiency-enhancing by eliminating the hassle factor for mining clients that will pay more for convenience and reliability, but can also have the effect of preventing competition from capable transporters that could compete on lower rates for those contracts.

In South Africa the presence of a few large integrated logistics firms such as Imperial with exclusive access to large producers and clients effectively means that in some segments of the market competition is limited. For example, the South African retailers and major food producers tend to contract with one main logistics firm that services their entire business and has the capacity in terms of fleet, storage, warehousing, refrigeration units and supply chain management technology to do so. Even large rivals of Imperial, which has made significant investments in capacity most recently, are constrained in terms of storage and distribution capacity to compete for Imperial's largest clients. In the case of Shoprite, the leading retailer in terms of expansion of operations in the region, logistics functions are internalised through a related firm Freshmark which mostly uses a set of preferred transporters from South Africa to export goods, effectively limiting access for other transport operators.

7. Conclusion

The factors that drive high transport costs in the region are a combination of structural issues and weaknesses in the administration and regulation of cross-border transport. On the one hand, the imbalance in production and trade flows between the countries means that return loads are limited. As such one-way transport costs from South Africa to Malawi, Zambia and Zimbabwe are high meaning inputs to production and food products are more expensive. On the other hand, bottlenecks in the administrative systems for crossing borders mean that transport costs are more expensive by at least \$13/ton.

Addressing these issues is critical for various reasons. There are important links established in the literature between upgrading road infrastructure and increasing trade. Improved infrastructure, more broadly, also contributes to growth in productivity and output. It is also clear that deficient road infrastructure networks undermine the potential for greater trade between countries, primarily through the effect on the costs of transit and relative competitiveness of goods. These considerations should place the challenges addressed in this paper at the centre

of current efforts by SADC and others to develop industrial capacity and regional value chains. A key contribution of this paper is to demonstrate that along with infrastructure investments, administrative and regulatory bottlenecks are just as important in terms of their effect on competitiveness and competition, which should be a consideration for assessing policy and transport networks in developing countries generally.

Intra-regional links have not been strong in the past as evidenced by the slow progress towards transport sector liberalisation and low levels of intra-regional trade in the 1990s and early 2000s. However, transport networks on main trunk routes have improved considerably and transit times have been reduced. Opportunities exist therefore to deepen integration through further improvements in border processes and using regulation to open up for cross-border rivalry between transporters as part of regional industrialisation strategies.

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- (1) Vilakazi, T & Paelo, A, 2017. Understanding intra-regional transport: Competition in road transportation between Malawi, Mozambique, South Africa, Zambia, and Zimbabwe. WIDER Working Paper No. 2017/46.
- (2) Vilakazi, T & Paelo, A, 2017. Towards the integration of markets: Competition in road transportation of perishable goods between Malawi, South Africa, Zambia, and Zimbabwe. WIDER Working Paper No. 2017/49.

The findings of the two working papers above were presented in the form of a PowerPoint presentation at the National Treasury and UNU-Wider Conference in November 2016 as below. UNU-Wider supported the research in partnership with National Treasury of South Africa, and authors of working papers were required to present the findings at the event. See:

- Thando Vilakazi and Anthea Paelo. November, 2016. Causes of high road freight costs in southern Africa for perishables and commodities. National Treasury and UNU-Wider Conference. Pretoria, South Africa. Link: https://www.wider.unu.edu/sites/default/files/About/1_2_vilakazi.pdf Accessed 9 April 2018.

One of the working papers above (1) is also referred to in a UNU-Wider research brief on the UNU-Wider website as a summary and policy brief drawing from the main findings of the research, as follows:

- 'Reducing transport costs to spur regional growth in Southern Africa'. UNU-Wider Research Brief No. 7/16. Link: <https://www.wider.unu.edu/sites/default/files/RB2016-7-Reducing-transport-costs-to-spur-regional-growth-in-Southern-Africa.pdf> Accessed 9 April 2018.

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