



Dar es Salaam to Lusaka: Fertiliser transportation in Tanzania and Zambia

PRELIMINARY DRAFT, NOT FOR CIRCULATION

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1. Introduction

The agricultural sector forms an integral part of the economy of countries in the SADC region, contributing between 4% and 27% to GDP in different member states and accounting for about 13% of overall export earnings.¹ A key input cost in agricultural value chains is fertiliser. For example, in South Africa (SA), fertiliser constitutes a large portion of grain and oilseed producers' costs, accounting for approximately 30% to 50% of costs.² A cost component which has been found to significantly add to the cost of fertiliser products is transport, particularly for landlocked countries such as Zambia. Most fertiliser is imported and then transported overland meaning that the nature of competition in transport and fertiliser trading is of great importance in determining the price to the farmer. This paper contributes to understanding the effect of competition on regional integration and development, specifically by assessing the nature and extent of competition in road freight and its implications. To assess the impact of freight on a key sector the study focuses on fertiliser trading and transportation in Tanzania and Zambia.

This paper is based on a report conducted for the Southern African Development Community (SADC) which involved a review of desktop research, collation of publicly available data and interviews with key industry participants and stakeholders. This included face-to-face interviews in Tanzania and Zambia. In addition, interviews were conducted with international companies that head offices in Johannesburg, SA as well as with regional transport bodies.³

Studies have emphasised the importance of transport costs in the price of fertiliser paid by the farmer as well as the detrimental impact of lack of competition in the trucking sector in increasing prices (see, for example, Gregory & Bumb, 2006). Our estimates indicate that transport rates in the region from ports to landlocked countries such as Zambia are as much as \$253 per ton, which accounts for more than 30% of the price of fertiliser. Many reviews over the years have considered the various reasons for the high costs of road freight in southern and East Africa including regulations restricting participation and competition, the role of national and regional transport associations, inefficient borders and poor roads, and lobbying and rent-seeking by powerful local transport interests.⁴ We try to sort out different reasons and their changing impact over time.

This paper is structured as follows. Section 2 examines data on fertiliser prices and costs including road freight. This section explores the reasons for the fertiliser price levels. Section 3 provides an overview of the road freight sectors in Tanzania and Zambia, including an assessment of the factors which affect it. Section 4 concludes and provides recommendations.

¹ <http://www.sadc.int/themes/agriculture-food-security/>

² Grain SA Fertilizer Report 2011.

³ A great deal of the analysis in this paper is based on data gathered during these interviews, although the sources of this information are not revealed as we are bound by confidentiality. Nevertheless, the integrity of the information gathered is maintained as far as possible. Furthermore, all errors in this report are our own.

⁴ See, for example, Arvis et al. (2010), Ward & Barreto (2011), Raballand & Macchi (2008), Teravaninthorn & Raballand (2009), and Argent & Milanovic (2014).

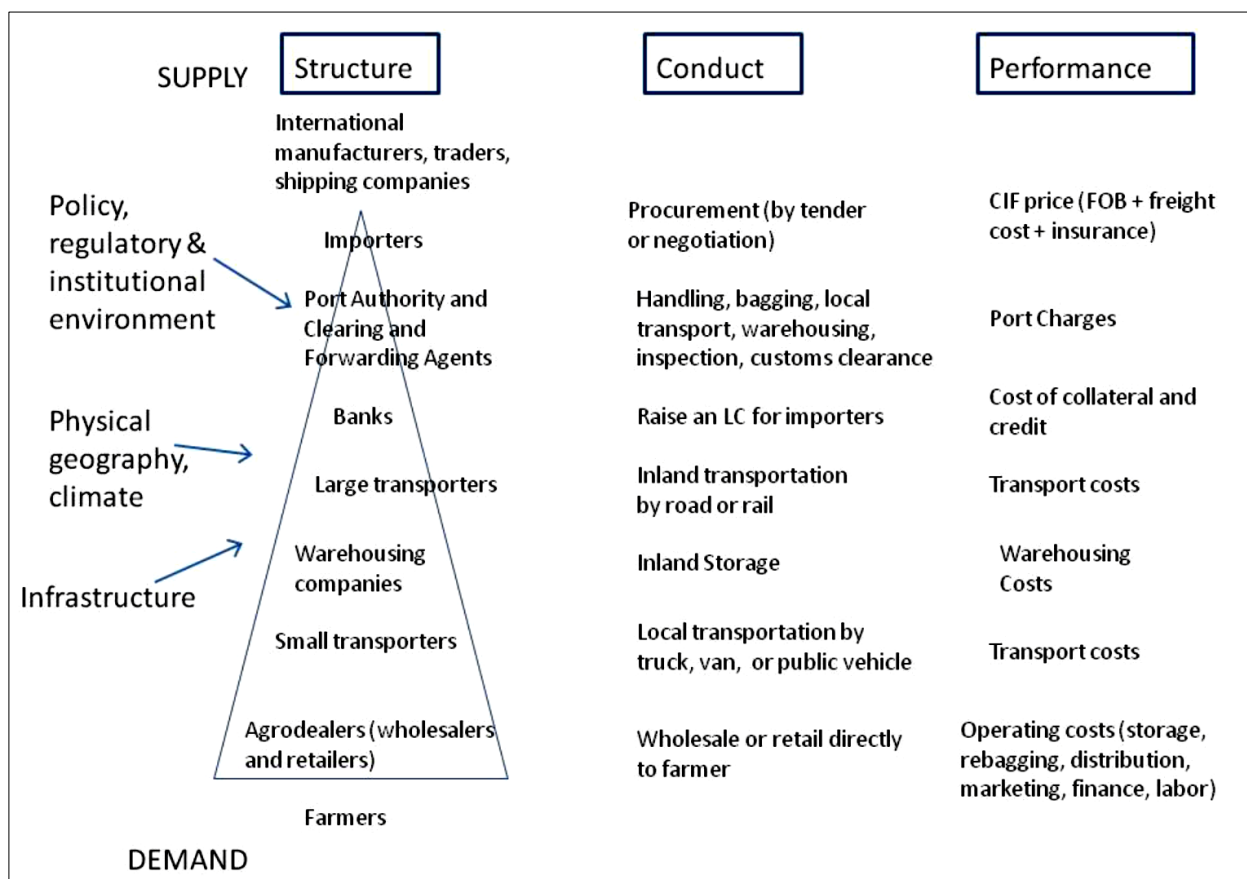
2. Value chain arrangements in fertiliser distribution

There is generally low fertiliser usage in Sub-Saharan Africa with 69% of total fertiliser consumption in Africa taking place in three countries – Egypt, South Africa and Morocco (Africa Fertilizer Organization, 2012: 5). The main factors affecting fertiliser supply and usage in Sub-Saharan Africa have been identified as market development constraints such as limited access to finance; technical constraints such as limited knowledge on the correct use of agricultural inputs; and infrastructural constraints such as poorly-maintained roads leading to agricultural zones (Gregory & Bumb, 2006).

For this paper, the most relevant of these factors are those pertaining to infrastructure and transport costs. Fertilizer is a good commodity to apply as a benchmark considering that it is relatively easy to transport and its affordability and consumption have important implications for agricultural policy and economic development in the region. By assessing the cost of transporting fertiliser specifically, we are able to discuss the price of road freight *relative* to the price of fertiliser currently, and historically. This can then be used to draw some inferences about the changes in competitive dynamics of the road freight industry in the study countries as well as competition in fertiliser trading.

As in most African countries, the fertiliser in Tanzania and Zambia is almost entirely imported. The following depiction of the domestic value chain for fertiliser highlights the important linkages between fertiliser importers and the logistics systems which ultimately deliver fertiliser to the farmers (Figure 1).

Figure 1: The domestic value chain for fertiliser



Source: Africa Fertilizer Organization, 2012

The fertiliser value chain essentially comprises three main stages: the processing of fertiliser at the port of entry, transportation from the port to the warehouses and transportation from warehouses to end-users through agro-dealers.

Our analysis in the following sections therefore considers the domestic transport rates and competition within countries (such as transporting fertiliser from Dar es Salaam to Tanzanian agro-dealers and farmers), and between countries. Note that traders may incorporate some of the transport, logistics and storage operations in-house or may contract these services. The ability to be an effective competitor at the trading level, however, requires being able to undertake this bundle of functions cost-effectively.

This paper addresses two overarching questions with regard to the road transportation and trading of fertiliser, specifically:

- How do fertiliser prices compare across countries, over time, and to estimated benchmarks of competitive and efficient supply?
- Can differences in the price of fertiliser in each country be explained by:
 - a) considering costs of transport and distribution, including inefficiencies and regulatory hurdles; and/or

b) low levels of competition in transport and fertiliser trading, including due to weak inter-firm rivalry and relatively uncontestable markets?

The analysis in the sections to follow presents trends in prices, followed by our analysis of competitive arrangements in fertiliser trading and road freight in each country.

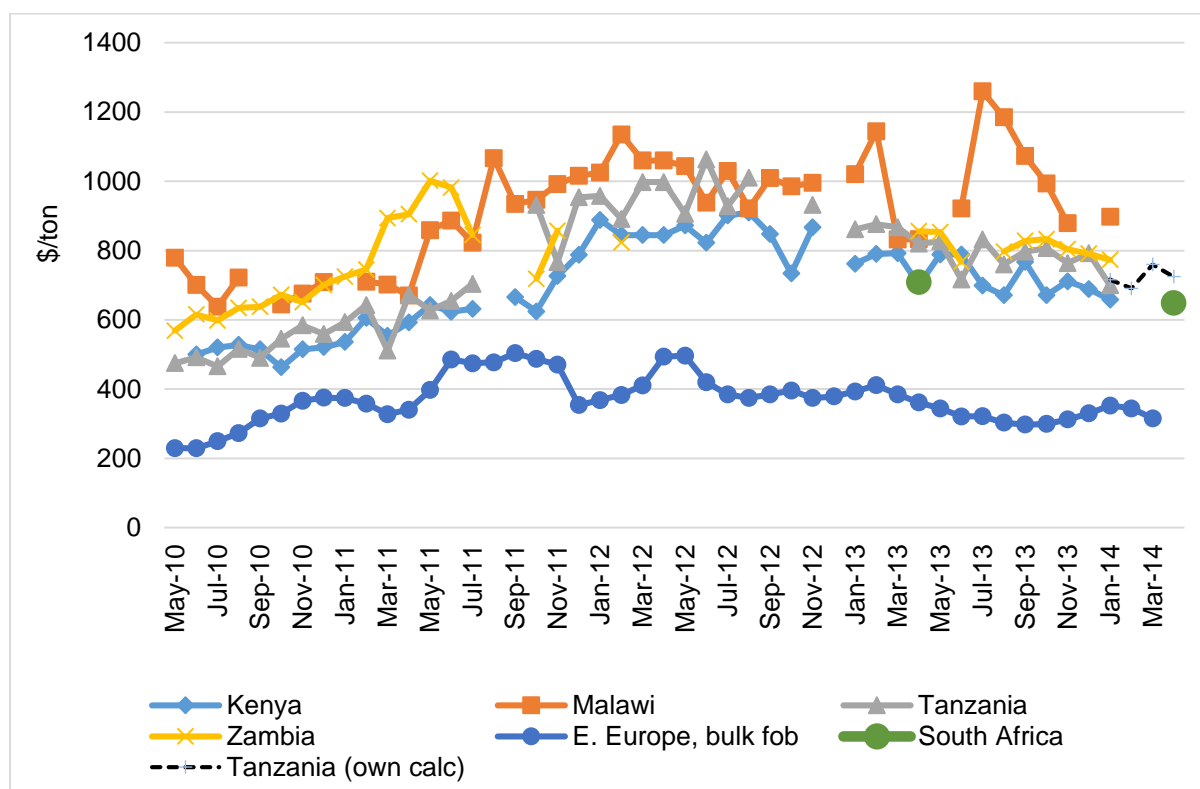
Fertiliser price trends

We begin by considering the prices of Urea and Calcium Ammonium Nitrate (CAN) for the period May 2010 to April 2014, the period for which data was available (Figures 2 and 5). Urea and CAN have been chosen as good products to compare across the countries due to the availability of data and the usage of these products in each country. We have also included the prices in Kenya and South Africa which provide benchmarks against which to compare the Tanzanian prices because both of the countries have direct access to ports, whereas Malawi has been included as a comparison to Zambia as it is also a landlocked country. We also benchmark these prices against a major international source for fertiliser, the Black Sea fob price. Except for South Africa, the pricing data reflect the national average prices in each country derived from monthly agro-dealer/retailer-level surveys.⁵

First, a general observation is that throughout the period there is a significant gap – at least \$200 in May 2010 – between the international benchmark price and the prices in each of the countries we consider, reflecting their position as importers. We further note that while international prices decreased from mid-2011, prices in our studied countries continued to increase meaning that the gap widened to at least \$300 over the fob export prices (that is, the prices paid to source imported fertiliser). One possible explanation for this could be that the costs of sea freight and insurance increased significantly in this period as well. However, the Baltic Freight Index which tracks prices in international shipping costs over time reflects decreasing costs from early 2010, albeit with some fluctuations (Figure 3).

⁵ AMITSA compiles the data by conducting surveys in the capital city as well as in towns in each of the key agricultural production areas in a country. The data reflects the national average of the list prices obtained from this network of agro-dealers who provide the information to AMITSA on a voluntary basis. Where there are gaps in the data, they reflect periods when insufficient data inputs were received for those months.

Figure 2: Urea monthly (national average delivered) prices, 2010-2014⁶

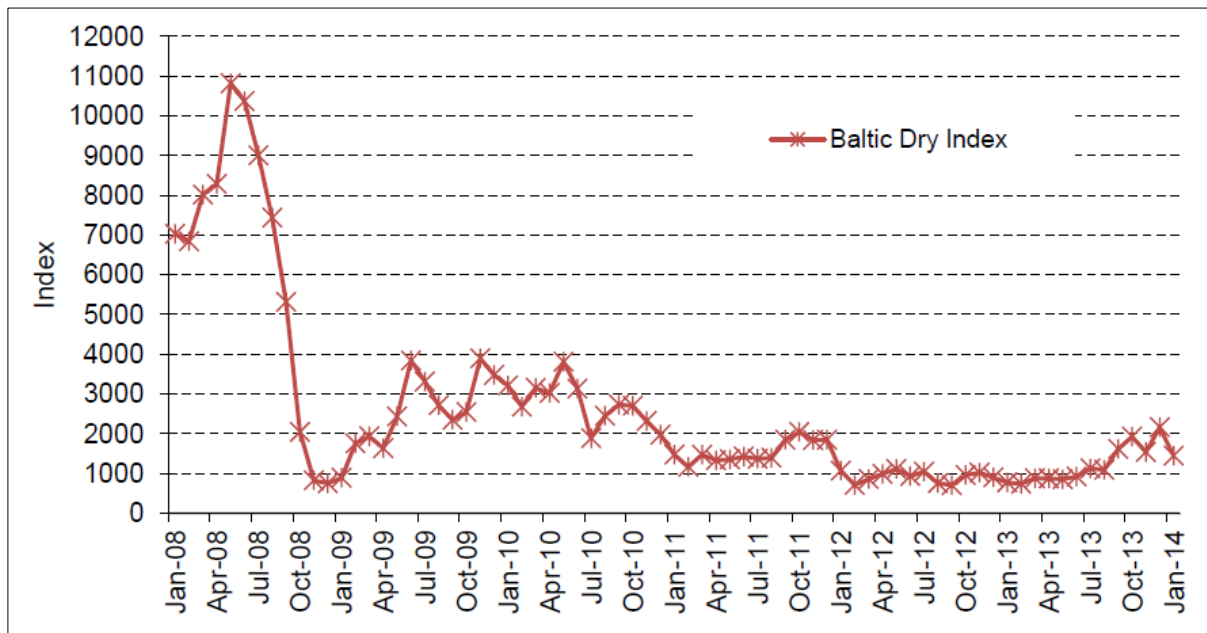


Source: www.amitsa.org ; www.grainsa.co.za for South Africa; World Bank (MIDAS)

Second, there are earlier and bigger increases in prices in Zambia and Malawi, in the first half of 2011, compared to increases in Kenya and Tanzania at the end of that year. The same pattern is reflected in CAN prices (Figure 5). This is consistent with higher transit costs as these are both landlocked countries with relatively long overland freight being required. Fuel prices did indeed increase by around one-third from early 2010 to early 2011 (Figure 4). There are other possible explanations such as domestic factors, which we explore in greater detail below.

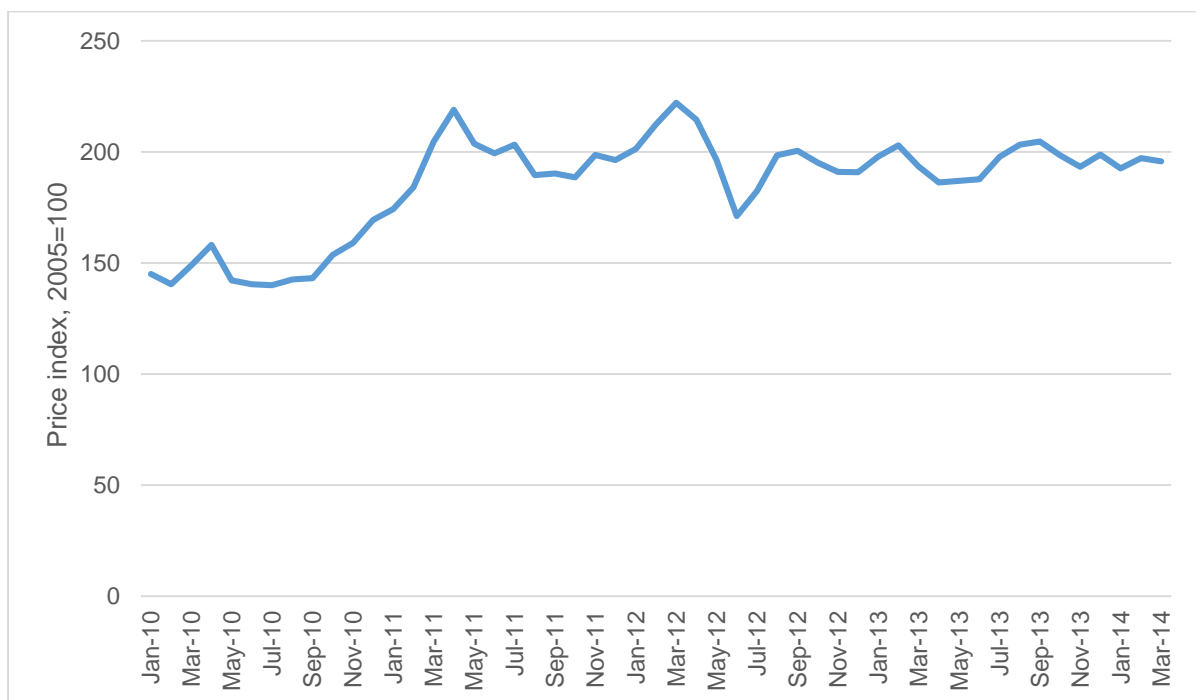
⁶ We have removed outliers in the data where the value is different by more than 50% (absolute value) from the value in the previous or next month for which data is available. For example, Zambian Urea prices showed an outlier of \$1702/ton in January 2012, and another outlier of \$1619/ton in June 2012 while Zambian CAN prices showed an outlier of \$1477/ton in January 2012, and another outlier of \$1579/ton in June 2012.

Figure 3: Baltic Freight Index, 2008-2014



Source: SAGIS in National Agricultural Marketing Council of South Africa (NAMC), February 2014⁷

Figure 4: Crude Oil Price index



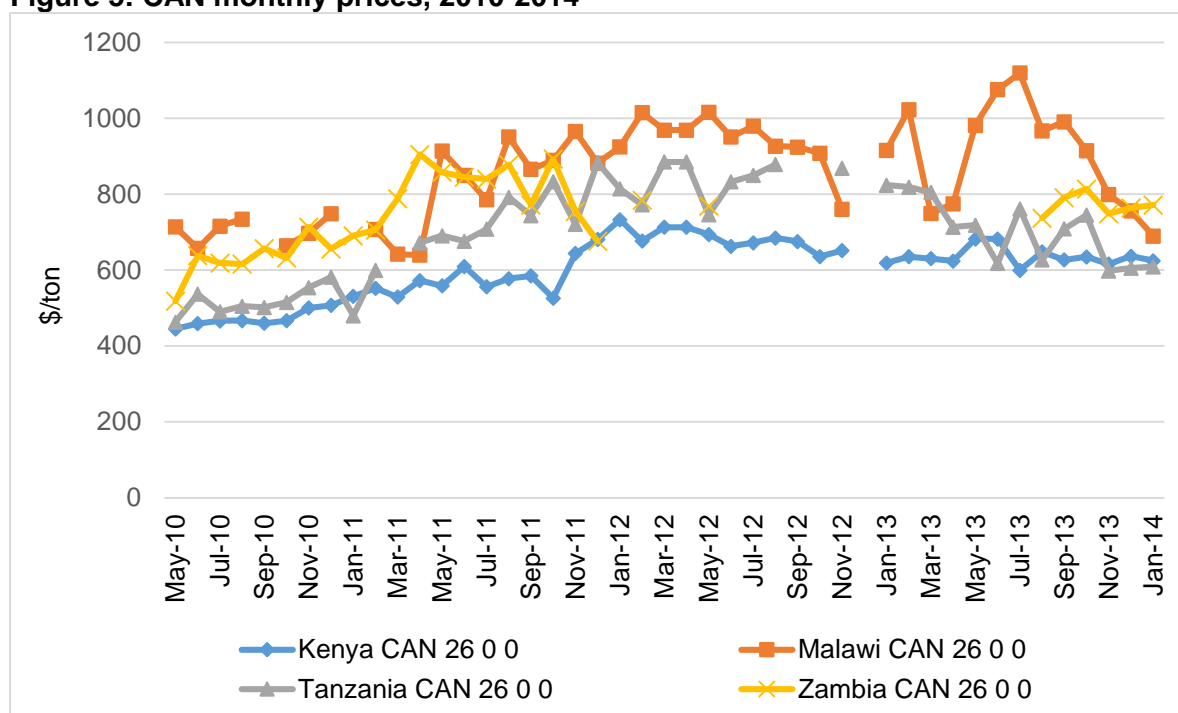
Source: www.indexmundi.com

⁷ See NAMC Markets and Economic Research Centre, Input Cost Monitoring February 2014; available: <http://www.namc.co.za/upload/Trends-in-selected-Agricultural-input-prices-February-2014.pdf> [Accessed: May 2014]

Third, Zambian prices of both Urea and CAN record a significant change relative to the other countries between 2010/11 and 2013. For both Urea and CAN we observe that Zambian prices in 2010 are in line with those in its landlocked neighbour Malawi and substantially above the prices in Tanzania and Kenya which both have major ports. However, over 2012 and 2013, the Zambian prices shift to be in line with prices in Tanzania. This is in contrast to the expectation that prices would be higher in Zambia in a manner that at least reflects the additional transport distance and thus the cost that is required to take fertiliser from the ports to the Zambian end-user.

Fourth, Tanzania prices increase in 2011 and 2012 relative to prices in Kenya. The average Urea price in Kenya for the 2013 calendar year was \$735/ton while the average price was \$810/ton in Tanzania. Other things equal, this represents a 10% mark-up in Tanzania over Kenya's prices, a slight decrease from 11% in 2011 and 13% in 2012. In this context, South Africa is also an interesting comparator because Zambia imports fertiliser from South Africa. The local price for Urea in South Africa in April 2013 was \$709/ton and \$648/ton in April 2014, in line with Kenyan prices and just around \$100 lower than the Zambia prices.⁸

Figure 5: CAN monthly prices, 2010-2014



Source: www.amitsa.org

We compare the average annual prices of Urea in Zambia and Tanzania to those in Malawi and Kenya for the period 2010 (from May) to 2013 (Table 1). We also indicate the mark-ups (in italics) of Kenya, Zambia and Malawi over a) Tanzania prices (blue) and b) the Black Sea fob benchmark price (red). We do not calculate average prices for Zambia for 2012 given the very small number of data points.

⁸ See www.grainsa.co.za. South African local prices converted using monthly exchange rate available at: <http://www.oanda.com/currency/historical-rates/>

Table 1: Average annual fertiliser (Urea) prices and international fob prices⁹

	Tanzania	Malawi	Zambia ¹⁰	Kenya	Avg. Black Sea fob (Urea)
2010 (May-)¹¹	516 <i>220</i>	696 <i>180</i> <i>407</i>	635 <i>119</i> <i>339</i>	509 <i>-7</i> <i>213</i>	296
2011	706 <i>285</i>	873 <i>168</i> <i>452</i>	853 <i>147</i> <i>432</i>	636 <i>-70</i> <i>215</i>	421
2012	965 <i>559</i>	1 019 <i>54</i> <i>613</i>		852 <i>-112</i> <i>447</i>	405
2013	810 <i>470</i>	1 014 <i>204</i> <i>674</i>	816 <i>6</i> <i>476</i>	736 <i>-74</i> <i>396</i>	340

Source: www.amitsa.org ; www.africafertilizer.org ; World Bank (MIDAS)

As noted above, the average price in Zambia was very close to that in Tanzania in 2013 (at just \$6/ton difference) from margins of \$119/ton over Tanzania in 2010 and \$147/ton in 2011. There are two possible reasons here:

- a) if we assume that the fob costs are the same for each country (as well as handling and port costs), then the Tanzanian price is relatively high which could be influenced by the costs of transportation within Tanzania and/or anti-competitive practices in the fertiliser market; or
- b) the Zambian price has been significantly lowered through increased efficiency, lower freight costs and competition in transportation and trading. It also likely includes the effect of prosecuting the cartel in fertiliser trading which lasted until 2012, discussed further below.

The comparison to the international benchmark suggests a combination of both at work, as Tanzania (and Malawi) prices have increased substantially from 2011 to 2012 relative to international prices.

The tables below present an illustrative exercise which demonstrates the mark-ups in Tanzanian and Malawian Urea prices over a hypothetical relatively competitive Urea price. This uses the average delivered price for South Africa as a relatively competitive price in a country with a major port (Table 2). The price of \$709/ton is also quite close to the price for Kenya of \$736/ton. For a landlocked country we add the transport rate from Johannesburg to Lusaka of \$110/ton.¹² Note that the South African price includes local delivery transport across the country.

⁹ Note that slight discrepancies in the mark-ups calculated are due to rounding.

¹⁰ There are only two data points for 2012 for Zambia and so we do not compute an annual average.

¹¹ For 2010 we average data from May to December which corresponds to the months for which national average fertilizer prices were available.

¹² Interview with Truck Company 1. This was the rate at which they stated that they could break-even on a trip from the Copperbelt to Johannesburg.

Table 2: Port and landlocked country price benchmarks, 2013

Competitive port country fertiliser price	\$709 per ton (South Africa)
Competitive transport rate	\$110 (Johannesburg to Lusaka)
Competitive landlocked fertiliser price	\$819 per ton (Zambia)

Source: Own calculations based on interview data and average pricing data

We then compared the average rates in each country to the competitive benchmarks above. This simple calculation shows that average Zambian prices were even lower in 2013 than the competitive prices by \$47/ton, suggesting that we have been conservative and the competitive benchmark should be lower by at least this amount (Table 3). Our exercise suggests that the Tanzania prices are too high by around \$100/ton (against the South Africa price) to \$150/ton (if we used the Zambia price as our benchmark) and the Malawi prices are too high by between \$150/ton and \$200/ton.

Table 3: Mark-ups over benchmark competitive prices by country, 2013

Country	Average fertiliser price (2013) (\$/ton)	Mark-up over competitive price per ton (\$/ton)
Zambia	816	-3
Tanzania (compared to port country)	810	101
Malawi (compared to landlocked)	1014	195
Kenya (compared to port country)	736	27

Source: Own calculations based on interview data and average pricing data

This confirms substantial mark-ups in Tanzania and Malawi in particular, over what would be competitive rates in a 'similar' port and landlocked country, respectively. Effectively, the calculated mark-ups represent the portion of the difference between the costs of fertiliser in each country that is not (or should not be) accounted for by transport costs.

We explore possible explanations for the mark-ups observed in each of the tables above in sections to follow, including trying to understand why the differential between prices has narrowed between Zambia and Tanzania when compared to 2010 and 2011. We do this by outlining the fertiliser importation process and use this to understand the composition of fertiliser prices and thus the aforementioned mark-ups.

The composition of fertiliser prices

The process by which fertiliser is imported into the Dar es Salaam port provides a good illustration of how fertiliser imports are handled at a port as well as the accumulation of costs and margins along the whole value chain. Fertiliser arrives at the Dar es Salaam port mostly in bulk which must then be separated and packed into 50kg bags that can be transported to importers' warehouses. This process can cause significant delays often resulting in penalties to the importer which are passed on to the clearing and forwarding company.¹³ To expedite

¹³ Interview with Freight Forwarder 1.

the handling of fertiliser a private initiative (terminals) was introduced by the Dar es Salaam Corridor Group (DCG) which was established in 2004.¹⁴ DCG's facilities, which are available just outside the port, are used to offload fertiliser ('break bulk'), facilitate clearance procedures, move the fertiliser out of the port area and bag the product for the importer. Our understanding is that when the bagging of fertiliser is done by DCG, they can discharge about 3000 tons per day versus 1500 tons by the port authority.¹⁵ These facilities for breaking dry bulk have improved efficiency at the port. The fertiliser is then transported from the port to the warehouse, the cost of which is estimated to be approximately \$9-10/ton.¹⁶ Finally, the fertiliser is transported from the warehouse to the final user.

We have assessed the composition of fertiliser costs and prices in Mbeya (Tanzania), using Urea as the benchmark product, based on interviews with two fertiliser companies operating in Tanzania and a study by the Tanzania Fertilizer Regulatory Authority (TFRA) (Ngowi, 2013) (Table 4). Mbeya is an agriculturally-active region in southwest Tanzania 828km from Dar es Salaam where maize, rice and wheat, among other crops, are grown. As such, fertiliser is in high demand in this Mbeya making it a good representative area for our exercise.

From these data we estimate a 'benchmark' which enables us to see where the big contributors to costs and mark-ups are, and whether they are higher than they should be.

Not surprisingly, the estimates of the fob prices (from the import source) are almost identical, as countries are price-takers in an international market. Sea freight and related costs are around \$50/ton, while port charges and bagging add further costs (which have been reduced). Taking all of the costs from the import source (on an fob basis) through the bagged product in a warehouse ready for local delivery adds around \$130/ton, including allowance for a margin for the importer (not included by Fertiliser Company 3, who also do their own bagging).¹⁷

By comparison, the local transport and trading activities add around \$160 to get to a final (net) retail price for the fertiliser trader. The retail list price of the agro-dealer is substantially above this, based on the prices recorded at a town which is approximately 74km from Mbeya and on the average recorded at agro-dealers across the country. Note that the transport cost is just \$50/ton (on some estimates even lower, while Fertiliser Company 3 has their own trucking operation on which they can include an internal margin). This means that an additional \$110 is included in the trader margin over and above transport, ex-warehouse to the agro-dealer (excluding the additional mark-ups at the retailer level as reflected in the higher list prices). This accords with our assessment of the amount by which Tanzanian prices are higher than the estimated competitive price (Table 4).

¹⁴ Yara is planning on opening their own bagging facility which will only handle fertilizer while DCG's platform also handles other dry bulk goods. See <http://www.bloomberg.com/news/articles/2014-09-02/yara-plans-2-5-billion-gas-based-fertilizer-plant-in-africa>

¹⁵ Interview with Fertiliser Company 2.

¹⁶ Interviews with Fertiliser Company 2 and Freight Forwarder 1.

¹⁷ This also compares with \$42/ton for the full cost of port handling at Dar es Salaam which includes off-loading, stevedoring, bagging, de-stuffing containers, and clearing to the port gate (Interview with Fertiliser Company 1).

Table 4: Fertiliser price composition in Mbeya, \$/ton¹⁸

	Fert. Company 2 Q1 2014	Fert. Company3 Q1 2014	TFRA (2013)	Benchmark	
FOB	352	350	-	350	+130
CIF	402	400	420	400	
Port charges	50	50	60	50	
Bags, bagging and storage	18.15	-	20		
Importer margin	20	-	-		
Sub-total: ex-port warehouse (bagged)	490.15	450	500	480	+160
Inland transport costs	43	60	50	50	
Wholesale price	573	545	563	560	
Final retail price	646.6	545	688	640	
Chimala average retail list price (AMITSA)	882¹⁹	882	757	882	
National average retail list price (AMITSA)	720	720	810	720	

Source: Interview data from fertiliser companies and Ngowi (2013)

The identification of around \$110 in excess charges in the price is also consistent with the very competitive final retail price of Fertiliser Company 3. Our assessment is that very recent moves to open up the market have allowed more competitive offerings. This includes the better access to the port enabling a more contestable market. In effect, the developments in early 2014 are consistent with the assessment of the mark-ups over 2011-2013 for Tanzania. In addition, the difference between Fertiliser Company 3's 2014 final retail price and the fob price – \$195/ton – is close to the 2010 difference of \$220/ton for Tanzania overall while for 2013 it was around \$350/ton (based on the TFRA study) and \$470/ton from Table 1.

These are significant differences, even though the final retail prices quoted in each interview are lower than the average national list price most likely because of significant volumes purchased and discounting to large customers in intensive agricultural regions such as Mbeya. Nonetheless, this suggests that fertiliser prices in Tanzania are far above what farmers should be paying and that farmers could benefit from more competitive rivalry in Tanzania.

The \$100-\$150/ton by which we find prices have been too high is split between inefficiencies, regulatory issues, trader margins, and other rents that may be due to competition issues related to barriers to entry and the level contestability of the market. The rest of this section assesses issues of competition in fertiliser trading while the other factors such as regulatory issues and transport costs will be elaborated on in Section 3.

Competition and market structure in fertiliser trading

This section outlines the main fertiliser companies and the structure of the market in each country. While there appear to be large numbers of suppliers when we examine the main traders we find that fertiliser trading in the region consists of a small number of large importers

¹⁸ Some of the figures do not necessarily add up to the total retail price in this table due to the unavailability of estimates for some of the components. Mbeya is 828km from Dar es Salaam.

¹⁹ Available AMITSA disaggregated monthly price data for Chimala which is 74km from Mbeya city (average of prices in January and March 2014)

that operate in more than one country, namely Yara, Omnia, Nyiombo and ETG, as well as a few significant domestic importers in each country.

In Tanzania, ETG and Yara are considered the largest importers in a fertiliser market of roughly 400 000mt in 2013. Estimates of their market shares vary, between 25%-40% each, suggesting their collective share is around 60-70%. The higher estimates are shares of nitrogenous fertiliser, which makes a difference in Tanzania as there is a local producer, Minjingu, of phosphates. Other suppliers of nitrogenous imported fertiliser include STACO with around 10% share, the state-owned Tanzania Fertiliser Company and Premium Agro Chem.

The Zambian market has historically been dominated by Omnia and Nyiombo, with collective shares estimated to be around 70-80% in 2009 in a fertiliser market of roughly 540 000mt.²⁰ ETG and Greenbelt have grown strongly in recent years whilst Nyiombo has lost a substantial share. According to one of the major fertiliser companies estimated shares for commercial sales only (not subsidised sales) in 2013/14 are: Omnia 30%; Greenbelt 30%; ETG 10%; Nyiombo 7%; Zambian Fertilizers 6%; and others 17%.²¹ There has also been an increase in smaller firms, including those set up by ex-employees of fertiliser companies. This may also be linked to the end of the cartel arrangements between Omnia and Nyiombo who were found by the Competition and Consumer Commission of Zambia (CCPC) to have rigged government contracts for fertilizer supply between 2007 and 2011.²²

Overall, the structure of the market at the level of fertiliser traders has an important impact on the outcomes in the road transportation level of the market. For instance, in cases where the fertiliser company is vertically integrated with a transport operation, they are able to internalize the margins typically earned by transport companies when the service is outsourced. On the other hand, when fertiliser companies outsource road transport services they can play a significant role in stimulating (or chilling) price competition between transport companies. For example, one of the large fertiliser companies in Zambia stated that they will generally contract one large trucking firm to facilitate their imports through Beira to Zambia (including clearing).

Generally, in markets where the opportunity to compete for contracts is infrequent due to long-standing vertical agreements and where buyers may have a preference for particular suppliers, it is difficult for rival suppliers to compete on the basis of price or efficiency. It is therefore worth considering the role of the buyers of road freight services even further. However, we begin the next section by analysing the state of road freight itself in Tanzania and Zambia, including factors which affect it.

²⁰ CCPC estimates in conjunction with IFDC, based on the number of people surveyed that were using a particular brand of fertilizer and not the total volumes of fertilizer sold in the country.

²¹ It is not clear how these shares can be estimated so closely unless the Fertilizer association is collecting sales data from market participants.

²² http://www.zambia-weekly.com/media/zambia_weekly_2013_-_wk_38.pdf. Both Tanzania and Zambia have a fertiliser subsidy programme which provides roughly one third of fertiliser into the market. However, the subsidy is not a key feature of this paper and has thus been left out.

3 Road freight in Tanzania and Zambia

For both Zambia and Tanzania, there has been an increase in the number of trucks over the last 5 years. For Tanzania, the increase in the number of trucks has been significant. Between 2009 and 2013, the number of licenses issued for goods services vehicles increased from 36 853 to 63 345 respectively.²³ While we do not have recent data on the number of trucks, data presented in Raballand et al. (2007) estimated that the number of *large* trucks plying Zambian routes was 3 900. However, information from interviews with various stakeholders of the Zambian road freight industry indicates that there has been an increase in the number of trucking operators in Zambia – and thus, by extension we can conclude that there has also been an increase in the number of trucks operating in that country.

The reasons for the increase in the number of trucks are similar. In Zambia, the number of trucks increased following the removal of import duties on second-hand trucks in 2008/9.²⁴ Similarly, the number of trucks in Tanzania increased after the removal of surcharges for the imports of trucks that are over 10 years old. Another reason for the increase in trucks in Tanzania is the relaxation of government controls which previously required that heavy loads be transported via rail.²⁵

As expected, the increase in the number of trucks in Tanzania has led a decrease in the transport rates from Dar es Salaam to the main local and transit destinations; the transport rates to Mbeya decreased from \$0.08 per ton per kilometre in 2011 to \$0.05 per ton per kilometre in 2014 while the transport rates to Lubumbashi in the DRC decreased from \$0.10 per ton per km in 2008 to \$0.07 per ton per km in 2013. While we do not have transport rates for Zambia's routes before 2014, all the current rates, including those to the main copper areas such as Kitwe, range between \$0.10 and \$0.16 per ton per kilometre.²⁶ While the rates from the Copperbelt to Johannesburg were \$0.06 per ton per km, the rates from Durban to Lusaka were between \$0.10 and \$0.12.

Zambia's domestic rates are generally higher than those observed in Tanzania on a per unit basis. This may mean that transport rates in Zambia were historically high and increased competition in recent years – as observed in the increase in the number of trucks – has only stabilised or brought prices down to these relatively higher market rates when compared to Tanzania.

For Tanzania, while there has been a clear decrease in the transport rates for both local and transit routes, the transport rates for the transit routes are slightly higher. Similarly, the transit routes in Zambia are higher than the local, with the transport rates to the DRC being particularly high. While the datasets from Zambia were not complete, we were able, through interviews, to gain key insights on both Zambia and Tanzania. The rest of this section analyses the factors which are likely to have led to the outcomes seen in the road freight sector.

²³ Data obtained from SUMATRA.

²⁴ Interview with a trucking company.

²⁵ Interview with SUMATRA.

²⁶ Interview data.

Factors which affect road freight

A number of reasons have been put forward to explain the increased demand for road freight services in both Tanzania and Zambia which have led to an increase in the trucks. This section outlines these reasons by assessing the factors which affect road freight in both Tanzania and Zambia.

The first factor which affects road freight is the performance of the economy as measured by economic growth and trade flows. The Southern and East African region has seen increased volumes of trade in recent years. This is linked to an increased demand for road freight services, given the constraints in terms of rail transport between countries. Perhaps the most significant feature of the trade data presented below is the growth of the DRC as a trade partner for both Zambia and Tanzania, in terms of exports and imports. Although the absolute values of trade are not large, from a low base the growth in trade flows has been significant. These flows are therefore likely to significantly influence the prices of road transport particularly where there are increased return loads for truck companies.

Other things being equal, we expect that economic growth will generally increase the domestic demand for a greater quantity and wider range of goods, with a concomitant increase in the demand for road freight services. Growth rates have been high in both countries, particularly in Zambia where growth rates were as high as 10% in 2010 (Table 1).

Table 5: GDP growth rates (%), 2008-2013

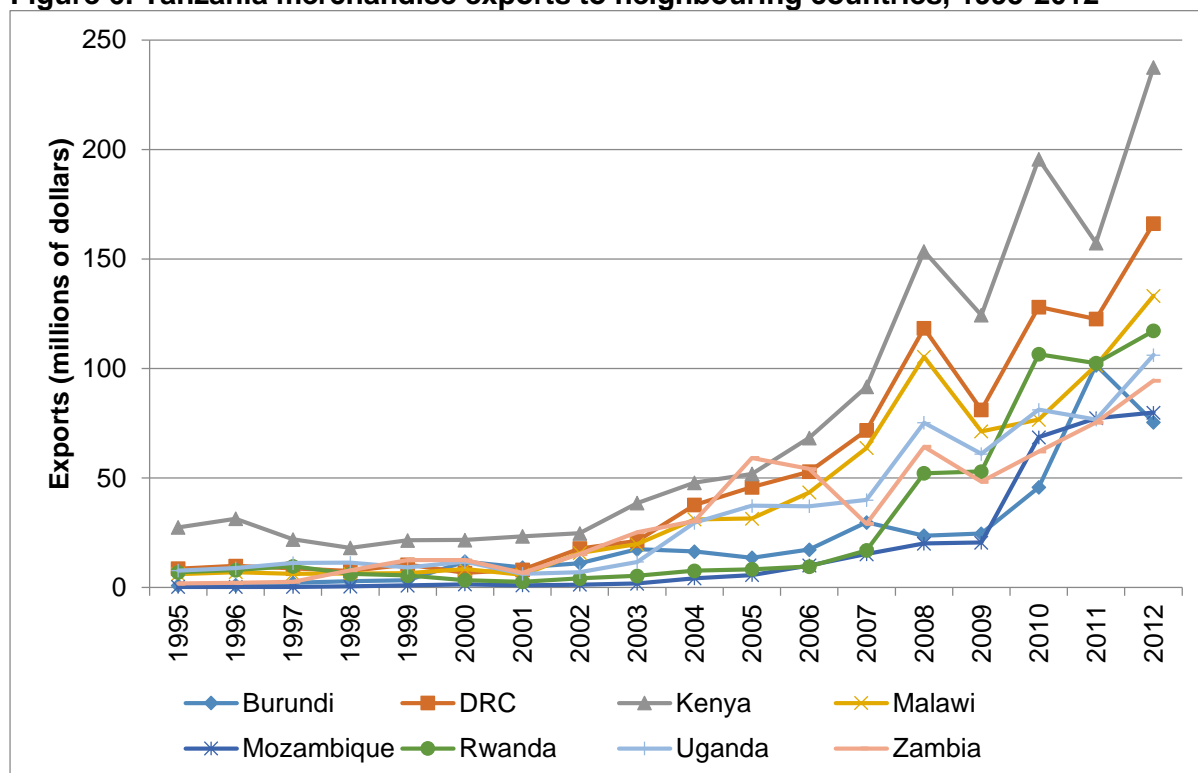
	2008	2009	2010	2011	2012	2013
Tanzania	7.4	6.0	7.0	6.4	6.9	7
Zambia	7.8	9.2	10.3	6.3	6.7	6.7

Source: www.worldbank.org

This high level of economic growth in Tanzania and Zambia is linked to an increase in the demand for road transportation of goods, as confirmed in interviews. This is also associated with substantial increases in regional trade flows. In Zambia, the growth in overall exports and demand for goods has attracted a large number of companies (including foreign firms) to the market and truckers make decisions on the rates they will charge on the basis of whether they will have a return load or not.

Tanzania has seen an increase in both imports and exports. Export figures show that demand for goods by neighbours has increased (Figure 2), including for goods to transit through Tanzania (29% of port traffic in Dar es Salaam is bound for landlocked countries). Zambia is a major user of the Dar es Salaam port among land-linked countries as it contributes 47% to total transit traffic (TPA, 2013: 32).

Figure 6: Tanzania merchandise exports to neighbouring countries, 1995-2012

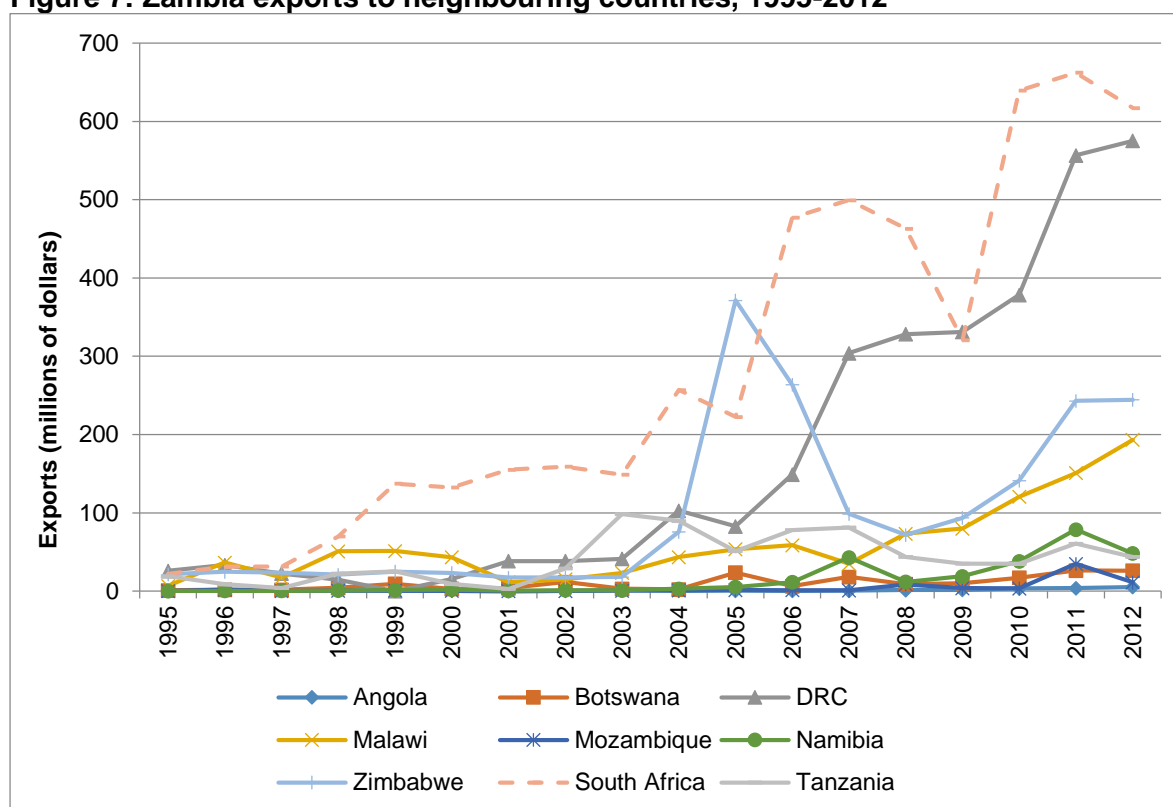


Source: UNCTAD

Zambia's trade has also increased dramatically over the past ten years, including that with countries in the region. Most notably the level of exports, particularly to neighbouring countries (e.g. DRC) has increased substantially in the period from 2005/6 (Figure 4). Increased trade has been driven primarily by the surge in exports to the DRC following the end of the civil war in that country (first elections in 2006), as well as the recovery in the global copper demand and price, which affects the economies of both the DRC and Zambia.

While South Africa is not a direct neighbour, it has been the largest African export destination in most years. This is significant as it means greatly increased freight along the major route from DRC and Zambia through Zimbabwe to and from South Africa (Johannesburg and Durban). Zambia's exports to Malawi and Zimbabwe have also increased significantly in recent years since 2008, both driven by increases in the exports of food items and manufactured goods (Figure 4).

Figure 7: Zambia exports to neighbouring countries, 1995-2012



Source: UNCTAD

The growth in imports has been mainly from South Africa, followed by large increases also from the DRC.

The sustained and very substantial increases in trade flows on the part of Tanzania and Zambia has had a major impact on the volume of road freight. This has been greatest along the routes to, and through, South Africa to Durban harbour. However, there have also been significant increases to Dar es Salaam, Beira and Nacala. Greater volumes can mean increased investment in trucks, coupled with more efficient and larger scale freight operations along with more competition.

The second factor which affects road freight is regulatory environment. The road freight industry – like any other industry providing trade services – is governed by domestic, regional and international regulations. These regulations work to enhance or to impede competition and market access in some cases. Argent & Milanovic (2014) provide an example that the lack of harmonisation between countries has resulted in a situation where truck operators in Rwanda are charged \$200 per transit vehicle license (i.e., per truck), whereas in Tanzania the charge is \$200 per trucking firm regardless of the number of trucks in the firm.

Both countries in the study applies a separate domestic regulation for road transport services. In Tanzania, the Road Traffic Act No. 30 of 1973 regulates vehicle mass on the roads and stipulates fees to be charged for overloading, for example. There is also the Surface and Marine Transport Regulatory Authority Act which gives effect to SUMATRA, the authority responsible for licensing trucks, dealing with consumer complaints, and generally promoting the interests of the trucking industry.

In Zambia, road transportation is governed by the Road Traffic Act No. 11 of 2002 in which there are specific provisions pertaining to issuing road service licenses or permits. Some of the quantitative restrictions for obtaining a road transport operator license were problematic under the regime as they directly restricted competitive rivalry (Meeuws, 2004).

Studies have also found that many of the inefficiencies in the sector arise from “inappropriate, ineffective or absent regulations that impede the development of a competitive domestic industry and frustrate cross-border trade in transport services” (Ward & Barreto, 2011: 13).

Other important regulations relate to cabotage, which prohibits foreign firms from transporting cargo between two points within a foreign country. The rule against cabotage has been highlighted in previous studies as an important determinant of competitive outcomes in domestic road transport markets in so far as it affects the ability of foreign registered trucking companies to compete in another country’s domestic market. However, it does seem that there are different views in the literature as to the significance of this rule.

In a recent study of the road freight sector in Rwanda regarding whether cabotage rules were actually a significant impediment to competition it was found that while it was not clear whether and how much rules against cabotage in the EAC affects costs of transport along the corridors, it was found that removing the regulation would “not improve the competitive position of Rwanda’s industry” (Argent & Milanovic, 2014). ,

A similar argument has been raised in the case of Zambia which has not removed restrictions on cabotage and the third country rule. Raballand (et al, 2007) argue that the influx of competition from regional trucking companies into the Zambian market has over time reduced transport costs to be on par with costs in South Africa. They also note that due to the nature of regulation in Zambia and the inter-relation in terms of trade between Zambia and South Africa, lifting cabotage and third country rules would probably have a muted effect.

The third country rule (which is widely applied in SADC) prohibits an operator from transporting goods from another country to a third without passing through its own country of origin. In terms of the third country rule, McKinnon (2012) notes that in the case of Tanzania there is currently progress in terms of allowing operators to obtain return loads from a country other than the one in which they have delivered exports.

The third factor which affects road freight, particularly in the Zambian market, is the impact of large buyers. When transporting copper, the copper mines are able to significantly influence prices in the market which tends to drive price up.²⁷ The trucking companies are essentially price takers in this regard as there are many trucking companies that are willing to transport copper from the mines such that the mines can virtually dictate the transport rates at this level.²⁸ The rates offered by the mines are fairly constant at an average of \$116/ton (and a low of \$100 /ton to Johannesburg), and a maximum of about \$135/ton via South Africa.²⁹ It is worth considering that the rates offered by the mines seem to still be higher than the competitive benchmark we establish above of approximately \$100-\$110/ton for a trip to South Africa. Roughly, the margin when compared to the rate offered by the mines is generally between 5% and 23%.

While the copper mines do not tend to pay very high rates to the trucking companies, the margins earned are not negligible and because of the high frequency of contracts associated with transporting goods from the mines to the ports, this is still attractive for trucking companies. This further highlights the importance of securing a return load from Johannesburg (if the transporter is Zambian) in order to obtain a higher rate.

In the domestic market, trucking companies find it more difficult to secure return loads within Zambia. Trucking companies commented that within Zambia, it is often a challenge to transport goods such as fertilizer to agricultural regions because there are limited opportunities for return loads if it is not harvest season. However, domestic operators have been insulated from the effects of the influx of foreign firms due to rules against cabotage which are still in effect in Zambia, and the third country rule. Rules against cabotage prohibit foreign firms from transporting cargo between two points within a foreign country while the third country rule prohibits an operator from transporting goods from another country to a third without passing through its own country of origin (Ward & Barreto, 2011). In a recent study of the road freight sector in Rwanda regarding whether cabotage rules were actually a significant impediment to competition it was found that while it was not clear whether and how much rules against cabotage in the EAC affect costs of transport along the corridors, removing the regulation would “not improve the competitive position of Rwanda’s industry” (Argent & Milanovic, 2014). Similarly, while rules against cabotage are still in place in Zambia, there has still been an influx of firms into its cross-border market, owing to copper exports and the availability of opportunities to secure return loads.

Moreover, important regulatory adjustments such as the introduction of a single permit system in Zambia have led to reduction in time spent at the borders in South Africa and Zimbabwe, thereby reducing the cost of transport. Transporting goods through the Chirundu border (Zimbabwe - Zambia) is apparently much faster than through Nakonde from Tanzania. There have been significant improvements at Chirundu over time and the border has become far more efficient over the past twenty years. From about five years ago it was already taking only

²⁷ Interview with Freight Forwarder 2.

²⁸ Interview with Truck Company 2.

²⁹ Interview with Truck Company 2.

2 days to clear customs procedures, whereas clearance used to take up to 21 days some years prior to this.³⁰

All the factors outlined affect either the demand for road freight and/or the transport rate itself. There has been a general increase in the demand for road freight services and a decline in transport rates in both Tanzania and Zambia. However, despite the improvements in the competitiveness at the freight level in Tanzania, these results are not observed at the fertiliser level. This presents a new dilemma as it seems to indicate that the benefits of increased competition in road freight do not filter through to final consumers where the price of fertiliser is concerned. Rather it is the market structure in the fertiliser industry which has had more of an impact, as evidenced in Zambia with the entry of ETG and the availability of backhaul for transporters which make a difference. Moreover, the increase in exports from Zambia to neighbouring countries would lead to an increase in demand for road freight services for the transportation of goods, particularly copper as confirmed in interviews. The competitiveness of rates offered for cross-border travel to and from Zambia are directly linked to the opportunities available for trucks to attract a return load, particularly in the case of copper exports and fertiliser imports. This is exacerbated by the lack of an efficient rail alternative for bulk goods transport. The issue of return loads may in fact be the most important variable affecting transport rates in Zambia, as a landlocked and growing economy.

³⁰ Interview with Freight Forwarder 3.

4 Conclusion and recommendations

To understand the economic importance of competitive and efficient transport and trading to users of these services we examined road freight services with specific reference to the transport, trading and supply of fertilizer products. This enables the margins and costs involved in transport and supply to be measured in terms of their effect on the final product price. It also recognises that the arrangements may combine access to port and storage facilities with transport, distribution and supply activities. For example, a company may have rights to terminals, warehousing and bagging facilities at the port and also own its own trucks.

Prices paid by farmers for fertilizer are higher (when the subsidy programmes are not taken into account) than in the sources of fertilizer such as the Middle East and Europe. For example, average prices over 2010 to 2013 have been as much as \$339/ton to \$559/ton higher in Zambia and Tanzania, than the Black Sea benchmark for Urea. These are 100% to 150% higher than the competitive international prices. While efficient and competitive sea freight and port charges can account for around \$80-\$100/ton (and port charges would be incurred for any importing country) even after subtracting these, the margins over international prices are around \$400-\$500/ton meaning African commercial farmers pay double for fertilizer than what farmers do in other countries with competitive fertilizer supply.

In Tanzania, the fertilizer prices were found to be relatively high, especially when compared to that of Zambia and the benchmark South Africa. This paper showed that increased competition in the truck industry led to a decrease in transport prices over time. However, inefficiencies and delays related to the Dar es Salaam port had the effect of raising transport rates and thus fertilizer prices. Moreover, the relatively poor backhaul opportunities meant that the transport rate would have to factor an empty trip, thus increasing the transport rate. That said, the benchmark exercise conducted based on Table 5 shows that transport but rather, the market structure in the fertiliser industry should also explain the margins of fertilizer prices over Zambian ones.

In contrast, Zambian fertiliser prices started off much higher than those in Tanzania but gradually moved to approximately on \$6 per ton above those in Tanzania. A number of factors explain why the Zambian fertiliser price became much more competitive. Firstly, there was increased investment in trucking services largely in response to domestic and regional growth. This increase in participation in the trucking sector is likely to have brought transport rates down. Secondly, increased mining activities provided significant backhaul opportunities for transporters of fertilizer and other goods. In effect, the transport cost is shared between the importation of fertilizer (or other goods) and the exportation of copper. This reduced the transport rate that would have otherwise been paid by the importer without the backhaul.

Thirdly, the single-permit system for Zambia, South Africa and Zimbabwe has made it much easier to operate across the countries. These increased efficiencies drive down transport costs such as border delays and in turn can be translated to lower transport prices. Finally, there was an increase in the participation of new fertilizer traders in the Zambian market and anti-competitive conduct was addressed by the CCPC. This has been reflected in the substantial decline in the market shares of the main players.

Based on our analysis, we make the following recommendations:

Careful monitoring of fertiliser prices: It is important for SADC and other regional bodies to facilitate the monitoring of the levels and composition of prices continuously in order to detect patterns that emerge in the main factors which affect those prices. This should be done on an on-going basis.

Increased co-operation between competition authorities in SADC: Increased co-operation between competition authorities in the region under the auspices of SADC will assist in detecting arrangements which affect the levels of competition not only in fertiliser trading, but also in transport, noting that these arrangements can operate across borders. It is also imperative that competition authorities co-operate and share information with each other noting that the same small group of fertiliser traders operate in more than one country in the region.

Fast-tracking the implementation of pro-competitive regulation affecting road transportation: Liberalising the market in terms of the restrictions on cabotage and the third country rule is important but is likely to have different effects in each country. However, it appears that there is also a range of practical remedies such as implementing single permit systems and implementing common regulatory standards for trucks across the region, which if enforced can improve competitive rivalry based on innovation, efficiency and quality of service, even while some regulations are retained which provide support for local participants.

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Annexure 1: List of interviews

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Transporters	1