



**Study of competition in the road freight sector in the SADC region
- case study of fertilizer transport & trading in Zambia, Tanzania and Malawi**

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1. Introduction

This research study has been done for the Southern African Development Community (SADC), funded by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). It 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 fertilizer trading and transportation across Zambia, Tanzania and Malawi.

The research involved a review of existing 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, which were organized and undertaken together with the Fair Competition Commission (FCC) of Tanzania and the Competition and Consumer Protection Commission (CCPC) of Zambia. In addition, interviews were conducted in South Africa with international companies with head offices in Johannesburg as well as with regional transport bodies (a full list of interviewees is contained in Appendix 1). As in many previous studies on road transportation, it is important to acknowledge the difficulty in obtaining reliable, market-wide data on the costs and prices for road freight. This study therefore uses a series of benchmarks and comparisons based on this interview data to aid the analysis.

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 The agricultural industry is also crucial for income, employment and food security in these economies. Input costs into agriculture are therefore of particular importance for the performance of the sector.

A key input cost in agricultural value chains is fertilizer. For example, in South Africa, fertilizer constitutes a large portion of grain and oilseed producers' costs, accounting for approximately 30% to 50% of costs.² A cost component which significantly adds to the cost of fertilizer products is transport, particularly for landlocked countries such as Zambia and Malawi. Most fertilizer is imported and then transported overland meaning that the nature of competition in transport and fertilizer trading is of great importance in determining the price to the farmer. Studies have emphasized the importance of transport costs in the end price of the product to the farmer as well as the detrimental impact of lack of competition in the trucking sector on increasing prices (see, for example, Gregory & Bumb, 2006). Our estimates indicate that transport costs 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 fertilizer. There have been many reviews over the years which 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.³ We try to sort out different reasons and their changing impact over time, but it is necessary to recognise the complexities involved.

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

² Grain SA Fertilizer Report 2011.

³ See, for example, Arvis et al. (2010), Ward & Barreto (2011), Raballand & Macchi (2008), Teravaninthorn & Raballand (2008), and Argent & Milanovic (2014).

It is important to understand road freight as an integral part of logistics services covering transport operators, distributors, freight forwarders, customs and border agencies and shippers. Where appropriate we distinguish between different entities in these operations, however, we are ultimately interested in the competitive provision of freight to users. In Africa, up to 90% of goods and passengers are carried by road transport (Ward & Barreto, 2011) and road freight contributes 1-5% of GDP in most countries.

Over and above transportation costs, large fertilizer companies in South Africa were found by the Competition Commission of South Africa to have engaged in anti-competitive practices such as price fixing and market allocation until around 2006, further artificially and illegally raising the price of fertilizers supplied locally and to the SADC region.⁴ Arrangements with traders were an important part of the way in which coordination worked across countries. Sasol was found to be in a cartel with two other major producers of intermediate fertilizer products, Omnia and Kynoch (then owned by multinational Yara) (Makhaya & Roberts, 2013). Similar conduct was unearthed in Zambia, where the Competition and Consumer Protection Commission of Zambia found Omnia Zambia Limited and Nyiombo Investments Limited to have rigged government contracts for fertilizer supply between 2007 and 2011 (Zambia Weekly, 2013).⁵

The study comes against the backdrop of very substantial changes in the region and the countries studied. We highlight some of the main changes here which are considered in more detail below:

- Very strong growth in the economies of Zambia, Tanzania and Malawi, and of neighbouring countries such as the Democratic Republic of Congo (DRC), which has been associated with a sharp increase in regional trade and demand for road freight. This has led to increased investment in trucks and trucking equipment.
- Increased competition between ports, including the port at Beira becoming a viable option in recent years and being substantially closer for Zambia and Malawi than Durban and Dar es Salaam.
- Opening up of the trucking sector in Zambia, which has increased the participation of operators from Zimbabwe and South Africa.
- Growing interest on the part of multinational corporations in the supply of fertilizer, linked to growth in agriculture although overall fertilizer use remains low in the selected countries.
- The continued operation of fertilizer subsidy programmes in different countries, and revisions to them over time.

The report is structured as follows. Section 2 provides an overview of road freight and regulatory arrangements and issues across countries, drawing on existing studies and interviews. We also review the growth in trade flows between countries in the region, which has a bearing on the demand for road freight, and on investment in trucking and storage facilities. Larger trucks and greater backhaul opportunities can mean that increased demand

⁴ Competition Tribunal Case No.: 31/CR/May05.

⁵ The two firms were fined for the conduct but this is under appeal.

is associated with lower costs. The trade data is also used to assess the extent to which Malawi and Zambia's demand for fertilizer is being increasingly served from Durban and Beira which are respectively more efficient, and lower in cost in terms of freight distance.

Section 3 examines data on fertilizer prices and costs, including road freight. Two key observations are made from this data. First, the price of fertilizer in Zambia compared to Tanzania is no longer at a margin above the Tanzania prices that would reflect the transport cost differential. There are possible explanations as to why the Zambian prices have fallen in relative terms, including more efficient transport, especially from Durban and Beira. Other possible explanations relate to why Tanzania prices are relatively high, including port charges at Dar es Salaam, low levels of competition in road freight, and the effect of regulations. Second, Malawian prices have been substantially higher than in other countries, and have increased relative to those of Zambia over recent years, notwithstanding that both countries are landlocked and a similar distance from the main ports. We assess the possible explanatory factors related to efficiency and regulations in transport (including at the port) and of explanations related to competition and contestability. These issues are also explored in more detail in the country-specific sections. Section 3 also describes the main fertilizer companies involved across and within the selected countries and how their operations have changed over time. It reviews data on imports and supplies over time for different fertilizer products and assesses the impact of the fertilizer subsidy programmes in each country.

Section 4 covers the in-depth assessment of road freight in Tanzania, while section 5 addresses issues in Zambia and section 6 discusses issues in Malawi. Section 7 draws together the main findings of the study and discusses the different factors at work. Section 8 concludes.

2. Overview of factors affecting road freight

A number of studies have reached similar conclusions regarding the high price and cost of road transportation in Africa. This section reviews the literature in this regard, outlining previous findings and highlighting the cross-cutting and country-specific regulatory issues. We also assess the overarching factors that can influence trade in road transportation services in terms of economic growth and the trade patterns in Zambia and Tanzania, as well as rail and competition between ports.

It is widely accepted that the price of road transportation in different regions in Africa is considerably high relative to other regions in the world (Gregory & Bumb, 2006; Raballand & Macchi, 2008: 4). These high costs have been assessed as significant contributing factors towards low agricultural productivity (Guo et al, 2009; Adamopoulos, 2011) and as an obstacle to economic growth (Raballand & Macchi, 2008).

There is an important distinction between transport prices and transport costs (Raballand & Macchi, 2008). Transport costs can be defined as the costs that the transporter incurs when transporting cargo, whereas transport prices are the rates charged by a transport company or forwarder to the shipper or importer (Raballand & Macchi, 2008: 2). In this regard, transport costs are not abnormally high in Sub-Saharan Africa, but transport *prices* are high on some corridors (Raballand & Macchi, 2008). Several studies have tried to explain why the prices might be high compared to other regions in the world.

One reason offered by Raballand & Macchi (2008: 3) is that official and unofficial market regulation and the structure of trucking services markets especially in West and Central Africa contribute to maintaining very high prices. This argument relates to market power being vested in a group of companies or agents, or with gatekeepers such as industry associations. Comparing these routes to other regions, the authors find that the “trucking environment and market structure in Central and West Africa is characterized by cartels offering low transport quality due to a combination of strong market regulation, high entry barriers, and the influence of freight bureaus/transport associations” (Raballand & Macchi, 2008: 10). One example of this is that in West Africa there are freight sharing schemes whereby there is a formal/informal queuing system to allocate freight to transporters requiring that a truck operator be affiliated with a transport association or pay bribes. On the other hand, the authors state that there are no queuing systems in southern and East Africa.

Similarly, Argent & Milanovic (2014) suggest that within the coastal countries of East Africa, for instance Tanzania, there are powerful trucking lobbies that seek to maintain control over the functions and rules governing the trucking industry. These are critical issues which we assess.

One underlying reason for this rent-seeking behaviour is that it is a function of the small market size in the case of landlocked countries compared to coastal countries (see Arvis et al, 2010). Importers have low bargaining power vis-a-vis powerful groups at ports and along transport routes to landlocked countries, and are also susceptible to rent-seeking within their own borders where, for example, authorities could exploit the limited opportunities to take advantage of importers. Clearly in our study Tanzania is not landlocked, while Zambia and Malawi are landlocked. However, even in Tanzania the presence of one critical port in the form of Dar es Salaam acts as a possible bottleneck where the design and enforcement of rules

and regulations means gatekeeping powers can be exploited to favour insiders including large trucking interests with links to port access.

Other studies have discussed factors related to infrastructure and regulation as drivers of high transport costs, although Raballand & Macchi (2008) have argued that the transport corridors in Southern Africa were the most advanced relative to other regions in Africa in terms of providing competitive and efficient services. Along with governance and rent-seeking behaviour, Ward & Barreto (2011) found that high costs are driven by: industry structure and low levels of competition between service providers; low productivity in the trucking industry due to infrastructure constraints; and, regulation of regional and international trade in transport services. In terms of low levels of competition, the authors argue that the informal transport sector (which would typically include owner-driver operators) is a significant source of price competition (e.g. in Namibia, and to a lesser extent in Malawi) although often at the expense of quality – vehicle maintenance and adherence to regulations such as overload limits.⁶

International comparative studies have confirmed some of the findings above regarding the challenge faced in logistics sectors in Africa. In a study that specifically addressed high logistics costs in landlocked developing countries, Arvis (et al, 2010) found that high logistics costs were actually less affected by conditions of poor road infrastructure, and more by the market structure and organisation of trucking industries, low logistics reliability and predictability including at ports, and rent-seeking and governance issues. The study finds that unpredictability and delays can be more costly to users than transport costs. This raises an interesting dimension – although there have been significant investments in transport infrastructure and measures to reduce the costs of transportation, the costs of transport (especially for international transport to landlocked developing countries) are actually comparable across different regions of the world. This is because transporters from developing landlocked countries usually have access to the same inputs as their counterparts in coastal countries in terms of fuel, tyres, and vehicle purchases (Arvis et al, 2010). For example, where developing countries experience higher variable costs due to the use of older trucks, they compensate for this by providing low labour costs for instance. Differences in the overall logistics costs only arise when comparing the prices which are passed on to customers (Arvis et al, 2010).

This finding is consistent with those in other studies where it has been argued that although transport costs in Africa are not necessarily high, the *prices* or rates faced by buyers of these services are. It is this aspect that our study seeks to explore. Along with market structure and rent-seeking behaviour (for example, by industry associations) which we discuss in subsequent chapters, we consider other substantial cross-cutting changes in the trade environment, particularly affecting those countries which this study focuses on, which have affected the outcomes in the road transport market in recent years. These include increasing trade flows and the emergence of competition between different ports and therefore routes, which we address below.

We distinguish between arrangements which are regulatory in nature and made by public institutions and those which are effectively put in place by market participants. We note that it is natural that there is an interaction between the two as different interests naturally lobby for

⁶ The situation in the transportation of fuel is slightly different in that fuel carriage regulations, technical standards for trucks and economies of scale have resulted in high barriers to entry and less competitive markets (e.g. in Botswana there are only two primary fuel carriage providers).

particular regulations and policies. We consider the objectives of the regulations and whether they are being implemented in line with these objectives. We assess whether the arrangements have unintended consequences in terms of creating an advantage for large participants and substantially increasing the prices (rather than costs) of transport to the detriment of all the users including end consumers.

Domestic, regional and international regulation of road freight

It is widely recognized that efficient and competitive services industries are essential inputs to the production of goods and other services throughout the rest of the economy. The provisions of the SADC Protocol on Trade in Services were meant to improve transparency in services regulation and highlight important bottlenecks to trade and investment. However, Ward & Barreto (2011: 14) argue that there is still some way to go towards achieving these objectives because (aside from SA and Lesotho who have made commitments under General Agreement on Trade in Services (GATS) Mode 3, which are expanded later in this section) “no SADC countries have undertaken commitments at the multilateral level to liberalize the road freight transport sector” and so this current round of negotiations, which began in 2012, is critical.

Trade in transport services is one of the six sectors on which the current SADC Trade Protocol negotiations are focusing.⁷ These six sectors are seen as having the best prospects for increasing trade within the SADC region (McKinnon, 2012). The negotiations generally follow a similar framework to the World Trade Organization (WTO) with liberalisation across different modes towards greater investment and trade being a primary outcome (Ward & Barreto, 2011).

The key principles of the SADC Protocol on Transport, Communications and Meteorology of 1996 are summarized below.

- Equal treatment, non-discrimination, reciprocity and fair competition
- Harmonisation of operations and integrated transport system
- Liberalisation of market access policies
- Exclusion of cabotage
- Interim quotas and capacity management measures

The Protocol (Article 5.3 pertaining to promoting market access in respect of international trade) is very specific that member states should liberalise their policies with respect to cross-border carriage of goods through 3 phases as follows⁸:

- Phase 1: Abolition of restrictions on carriers of two member states moving goods between those states, or through the territory of one member state en route to another member state.
- Phase 2: Abolition of restrictions on carriers of one member state moving goods on a defined route between member or non-member states irrespective of whether that carrier has passed through its home state.

⁷ Other sectors are construction, communication, energy-related, tourism, and financial services. See <https://tis.sadc.int/english/tis/trade-in-services-negotiation-in-sadc/negotiations-among-sadc-member-states/>

⁸ SADC Protocol on Transport, Communications and Meteorology (1996).

- Phase 3: Abolition of restrictions on carriers of one member state carrying goods between another member state and a third member or non-member state.⁹
- Member states are allowed to impose interim quotas and capacity management measures on a temporary basis. Importantly, member states are also not obliged to introduce liberalisation measures in favour of carriers from another state if that other state does not afford carriers from the first member state the same (equal) market access (reciprocity). Member states are also not required to 'permit carriers of another member state to carry goods between points' in the first member state.

Lastly, Article 19 of the Protocol commits to member states to applying their respective competition laws with a view to preventing the benefits of the Protocol from undermined by anti-competitive conduct.

The WTO's GATS advocates for its signatories to progressively liberalise their services sectors in each of the following categories (Modes of Supply):

- Mode 1: cross-border trade;
- Mode 2: consumption abroad;
- Mode 3: investments; and
- Mode 4: temporary movement of natural persons to provide services.

Domestic regulation also has substantial effects in restricting market access for foreign participants in some countries and in terms of realising the objectives of the Protocol. According to market participants in Tanzania, for example, the domestic regulation still only permits tri-axle trucks which restricts some foreign trucking companies from operating and competing in that market.¹⁰ Similarly, 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. Furthermore, countries will apply different regulations depending on their membership to different free trade areas. For instance, Kenya and Uganda apply Common Market for Eastern and Southern Africa (COMESA) rates for road tolls, whereas Tanzania applies the SADC guidelines (Argent & Milanovic, 2014: 22). This is interesting because Tanzania is also party to the Tripartite Agreement between Uganda, Kenya and Tanzania which states in Article 9 that "Partner States agree to formulate policies that will lead to harmonisation of technical standards such as safety and fitness of vehicles, vehicle loads, and axle load limits" (EAC, 2001).

This speaks to inconsistencies between the objectives outlined in major regional agreements governing road freight, and the enactment and enforcement of these provisions by individual member states. Each country 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.

⁹ The difference between Phase 2 and 3 are the limitations with regards to using a 'defined route' which are absent in Phase 3.

¹⁰ Also see McKinnon (2012: 13).

According to this Act, SUMATRA's functions include establishing standards for regulated goods and services and regulating rates and charges.¹¹ However, in an interview with SUMATRA officials it was revealed that SUMATRA only sets/intervenes in the setting of prices if they find that there is no competition in the industry. This could arise from possible cartel conduct or if there are firms with high market power. To assess the levels of competition in the market, SUMATRA regularly estimates a maximum price (or 'cap') which they use as a benchmark to which they compare the prevailing market rates. This benchmark is constructed by accounting for factors such as trucking company overhead costs, efficiency of trucks, typical number of trips, and other variables that account for how a trucking company is expected to operate and what factors affect their price setting. SUMATRA then compares this benchmark to the prevailing prices in the market, and it has historically found that this economic benchmark rate is usually higher than the market rates from which it has concluded that the market is competitive.

Since 2004 when SUMATRA was established, it has always found the market to be competitive although interestingly SUMATRA has found the market to have become even more competitive in the past 2-3 years compared to even five years ago. This suggests that there were perhaps questions as to the competitive intensity in the past. SUMATRA attributes greater competition in the past 2-3 years to increased participants as more firms have turned to road transportation following the decline of rail. The authority also advised that even before they were established there were no price controls imposed on the market.

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). These included provisions whereby the Director can refuse or vary a license on the basis of: the suitability of the routes for which the service may be provided under the license; the needs of Zambia as a whole in terms of traffic and the coordination with other forms of transport; and facilities available to the applicant for carrying out vehicle maintenance and mechanical repairs.

Our understanding is that provisions of this nature seek to interfere with the conduct of trucking companies in the market and may restrict free entry and exit to the market or to certain routes, by regulating the 'quantity' of competitors in the industry rather than the 'quality' of competition. The latter could be done by ensuring harmonization of standards and rules which promote competition on the basis of quality, such as those pertaining to overloading, transit bonds, border management and charges, and rules preventing corruption, for instance.¹² Certainly, trucking companies should be free to compete directly with other forms of transport. Under regular conditions of competition, inefficient companies will be forced to exit the market due to facing competition from more efficient rivals. The effect depends on how the provisions have been implemented in practice. As we discuss in sections to follow, we have found that there

¹¹ Prior to SUMATRA's establishment its functions were performed by the Central Transport Licensing Authority (CTLA) and the Regional Transport Licensing Authorities (RTLAs).

¹² See Bingandadi, L. 'Presentation on Progress and Status of Implementation of Road Infrastructure, Transport and Traffic Sector Policies, Legal, Regulations, Technical Standards in SADC'; Presentation for the USAID Trade Hub Workshop on the Road Freight Transport Services Sector in SADC (27-28 September 2011).

has been entry to the Zambian market by domestic and foreign companies which has significantly increased competition.

At a regional level, road transportation in Zambia is affected by both the SADC Protocol and Chapter 7 of the COMESA Treaty on Co-operation. The functioning of these agreements is particularly important to the Zambian economy due to the significant constraints to trade faced by landlocked countries. Zambia is a landlocked country (752617 square kilometres) which borders 8 countries: Botswana, Namibia and Zimbabwe to the south; Angola to the west; Tanzania and DRC to the north; and Malawi and Mozambique to the east. Its shortest route to sea (using road and rail) is through Zimbabwe to the Beira and Nacala ports in Mozambique; the alternative is through the northern corridor to the port of Dar es Salaam in Tanzania or through Durban and East London in South Africa. Approximate distances from Lusaka to the different ports are as follows: ¹³

- Dar es Salaam: 1951km
- Durban: 2143km
- Beira: 1048km
- Walvis Bay: 2074km.

There are important incentives for Zambia to cooperate with its neighbouring countries, including the facilitation of trade with each of these countries which we discuss in sections to follow. Zambian trade with its neighbouring countries has increased substantially since about 2005/6. According to Meeuws (2004: 25), Zambia has implemented most of the provisions of the SADC Protocol and COMESA Treaty's road transport facilitation programmes (except control of overload) including: harmonized road transit charges, maximum axle load limits, maximum length of commercial vehicles, the COMESA carriers' license and transit plates, and the use of the High Frequency X-border Land Mobile Radio Communications System.¹⁴ Zambia also has bilateral road transport agreements with SA, Zimbabwe, Malawi, Tanzania and Namibia which deal mainly with market access on international transport (Meeuws, 2004).

Based on the precepts of the SADC Protocol, the agreements between Zambia, Zimbabwe and South Africa include the use of a single permit system although this is difficult to implement in practice. Importantly however, Zambia has not removed restrictions on cabotage and the third country rule, which we discuss below.

In terms of overlapping regulations, 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). Similarly, McKinnon (2012) found that most concerns in the road freight sector relate to the management and enforcement of cross-border transportation regulation including the cabotage and third-country rules. For example, Tanzanian truck operators stated that on the corridor to the DRC through Zambia, they encounter numerous roadblocks and weighbridges, unnecessary border delays, and excessive road toll charges and fines (McKinnon, 2012: 12).

These concerns speak to the constraints to the trade in transport services which SADC, and other regional communities, are trying to address.

¹³ Google Maps.

¹⁴ Report of the Seventh Meeting of the Transport and Communications Committee, COMESA (February, 2003).

There is a general view that many SADC countries have some way to go in terms of liberalizing under each GATS mode and aligning trade outcomes to the founding objectives of the SADC Protocol (see Meeuws, 2004: 25). For instance, Ward & Barreto (2011) identify the following concerns in the road freight sector under each GATS mode (using Botswana, Malawi, Mozambique and Namibia as case studies):

Concerns related to Mode 1 (a truck travelling across borders):

- restrictions on **backhaul** whereby trucks can export goods but are not allowed to import goods back to their home country on their return leg which is particularly problematic for landlocked countries;
- **limitations on routes and facilities** that operators can use e.g. in Malawi foreign firms can only use certain warehouses along the Blantyre-Lilongwe-Mzuzu route;
- **foreign cabotage** rules prohibit foreign firms from transporting cargo between two points within a foreign country; and
- 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.

Concerns related to Mode 2 (a foreign company contracting the services of a domestic firm):
No identified cases of restrictions on consumption abroad.

Concerns related to Mode 3 (foreign firm establishing a commercial presence/offices in domestic market to provide services): Generally competition from foreign firms that establish a domestic presence is permitted in most SADC countries although it can be restricted in terms of the levels of foreign equity allowed – e.g. indigenisation rules.

Concerns related to Mode 4 (movement of truck drivers and technical staff): Trade is restricted in terms of visa applications, work permits, training certifications, many of which restrictions are actually permitted by the GATS Annex.

The concerns raised under GATS Mode 1 are perhaps the most critical to promoting increased regional competition and trade in services. These concerns are also linked to the ability of foreign operators to obtain operating permits in another country. This aspect is critical to enhancing competitiveness and at times obtaining a permit is one of the primary barriers to entry. Although it does seem that even where foreign transport operators are able to obtain permits to operate in other countries, challenges arise in terms of the costs and delays of obtaining these permits, which can take months in some cases. One trucking company advised that a trip from Dar es Salaam to Lubumbashi can take up to four weeks compared to two weeks to Lusaka due to the significant delays involved in processing relevant documentation.

Cabotage and third country rules

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 regarding the significance of this rule. Although we discuss its impact further in the analysis of the market in each country, it is worth noting the differing perspectives from other studies.

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, “*cabotage regulation in the EAC does reduce the efficiency of transport corridors, but it is unclear how large the gains to be made are. At worst, removing this regulation would not increase the costs of transport along the corridors, and at best it will improve it by some small margin. However, this will not improve the competitive position of Rwanda’s industry and may in fact reduce it, due to the advantages that Kenya and Tanzania hold in the pursuit of business within their own territories*” (original emphasis) (Argent & Milanovic, 2014).

A similar argument has been raised in the case of Zambia. 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 on the transport sector in Zambia. “*Freight characteristics in Southern Africa, regional FDI flows in the trucking sector and the possibility of Zambian operators to benefit from cabotage in South Africa have induced similarity of operating costs between Zambian and South African operators. Hence, there is already limited scope for reducing costs on the international trade routes through complete liberalization*” (Raballand et al, 2007: 26). The effects of the changes in Zambia (while retaining cabotage and third country rules) are something we assess here. We do find substantive improvements in Zambia related to the changes made, and when compared to the other two countries.

These findings have important implications for possible recommendations in improving the levels of competition in the study countries. It may be that in countries such as Zambia and Kenya where the domestic market is relatively competitive, there is likely to be limited gains to competition from lifting certain rules that affect the domestic market, such as rules against cabotage. In any event, according to McKinnon (2012) there is currently no enthusiasm from member states in SADC, for example, to lift the rule pertaining to cabotage. Our understanding is that currently only South Africa allows cabotage, although there are substantial charges levied in order to obtain a cabotage permit. Innovations such as ‘TransZam’ in Zambia could aid progress in this regard. This is an online platform makes it possible for clients to advertise loads which need transporting, and for operators to advertise their backload capacity.

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. However, Tanzanian operators have argued that this should only be “limited to backhauls carrying cargo back to the home state for fear that this could take away market share from their home market” (McKinnon, 2012: 17). This would mean that there would be empty movements between the destination country for exports, and the (third) country where the return load would be collected. Operators have also argued that they would like to see relaxation of the third country rule however they would not like to see the removal of the cabotage rule which protects domestic operators (many of which only operated in domestic markets) from foreign competition (McKinnon, 2012: 14).

According to Raballand and Macchi (2008: 21) some countries in the region did allow third country transit, including South Africa, Zimbabwe (on a reciprocal basis) and Malawi (during a defined period of time).

Interestingly, this issue has not been raised by trucking companies interviewed in this study although these companies have argued strongly that the ability to secure return loads is a very important contributor to the rates that they charge in the market.

The effect of economic growth and increasing 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. As we discuss in the analysis of competition 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.

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 the countries studied, especially in Tanzania and Zambia which have recorded consistently strong GDP growth, while Malawi had a major decrease in 2012 (Table 1).

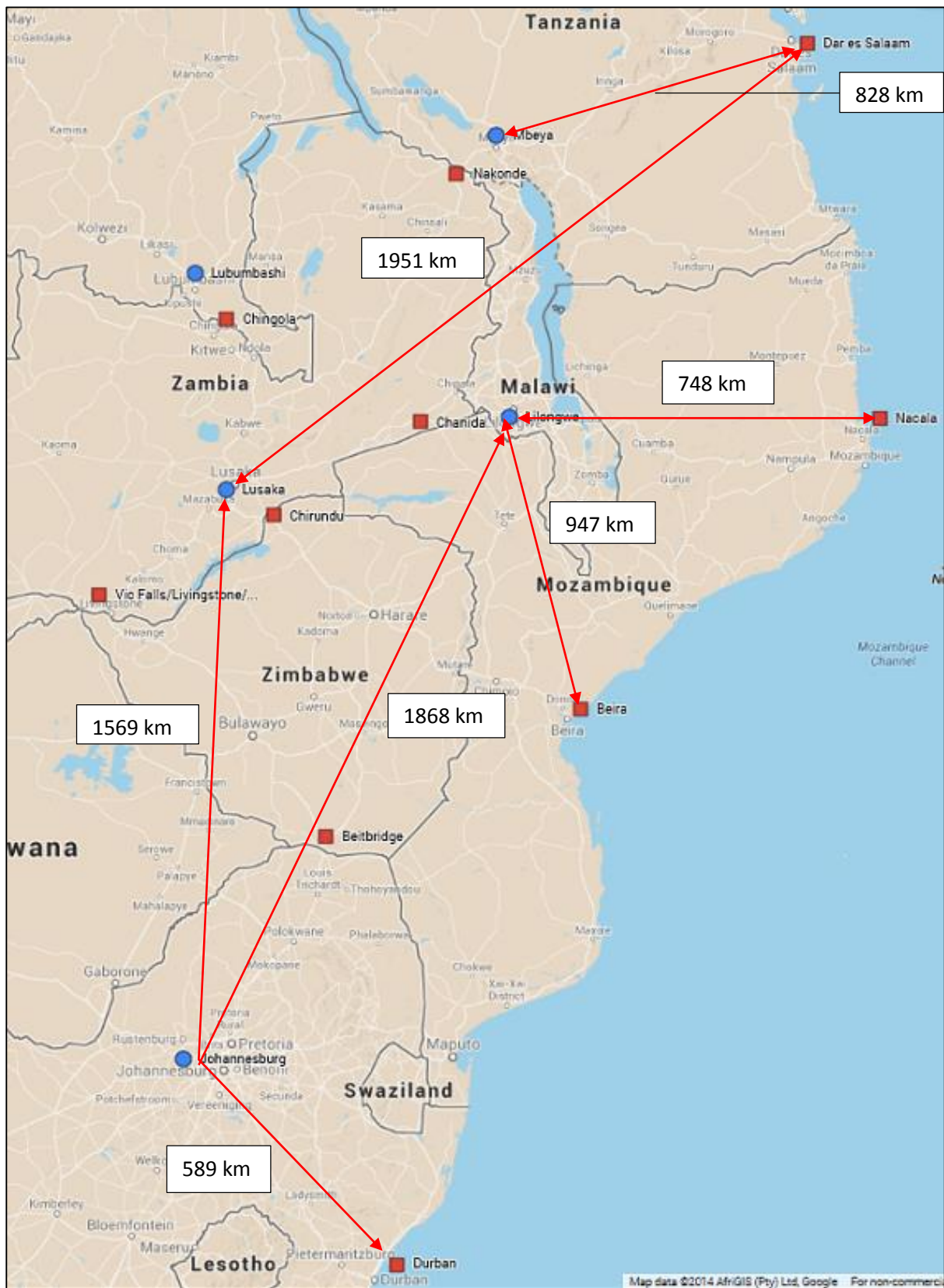
Table 1: GDP growth rates (%), 2008-2012

	2008	2009	2010	2011	2012
Malawi	8.3	9.0	6.5	4.3	1.9
Tanzania	7.4	6.0	7.0	6.4	6.9
Zambia	7.8	9.2	10.3	6.3	6.7

Source: www.worldbank.org

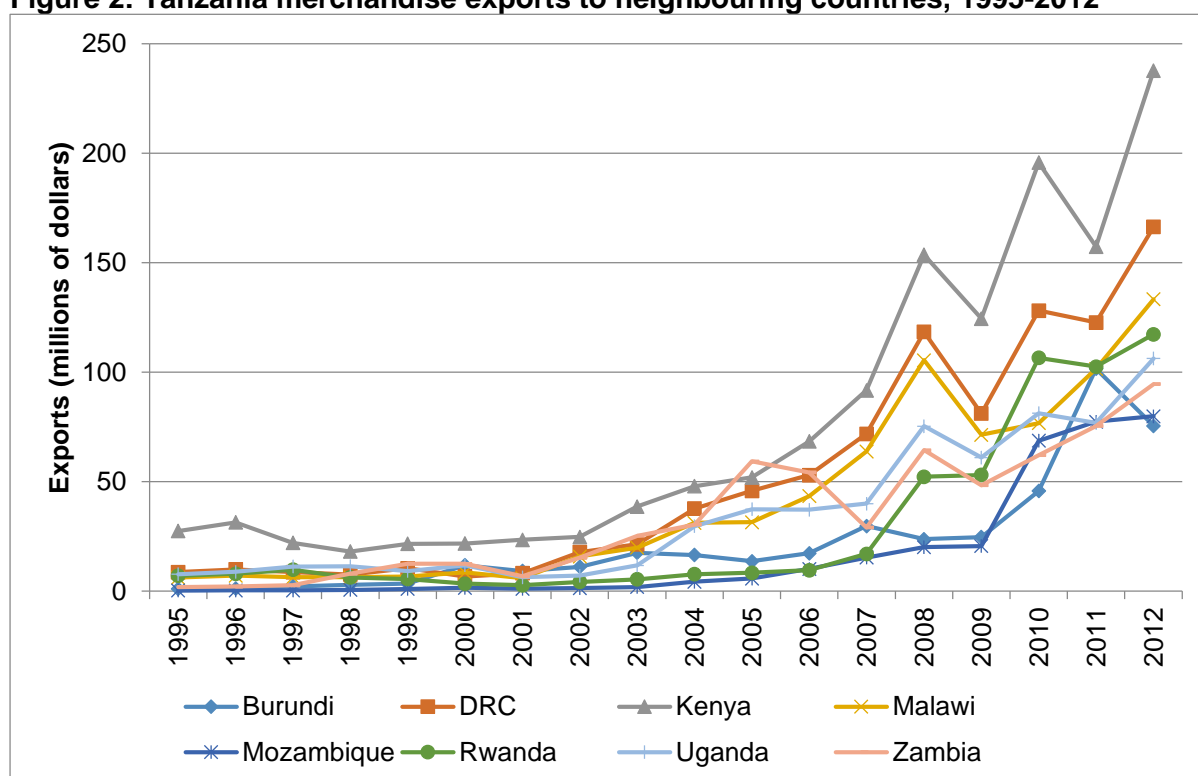
This high level of economic growth in Tanzania and Zambia is linked to an increase in the demand for road transportation of goods, as confirmed in interviews. This is also associated with substantial increases in regional trade flows. We further discuss the implications in terms of increased market participants in the country analyses. The map below (Figure 1) shows the key areas in the region as far as trade is concerned. We identify the main ports through which goods are transported such as Durban and Dar es Salaam and key cities such as Mbeya and Lubumbashi, including approximate driving distances between key ports and cities.

Figure 1: Regional map (Malawi, Tanzania, Zambia)



Tanzania has seen an increase in the demand for goods by neighbours, including for goods to transit through Tanzania (29% of port traffic in Dar es Salaam is bound for landlocked countries). Zambia is the major user of the Dar es Salaam port “among land-linked countries and continues to be a dominant customer” (TPA, 2013: 32). It contributes 47% of total transit traffic. The second highest landlocked user of the Dar es Salaam port is the DRC. There has been a dramatic increase in Tanzania’s exports to neighbouring countries across the board from 2003, led by exports to Kenya and the DRC (Figure 2). However, Tanzania’s merchandise exports to Zambia lag behind those to Rwanda, Malawi and Uganda.

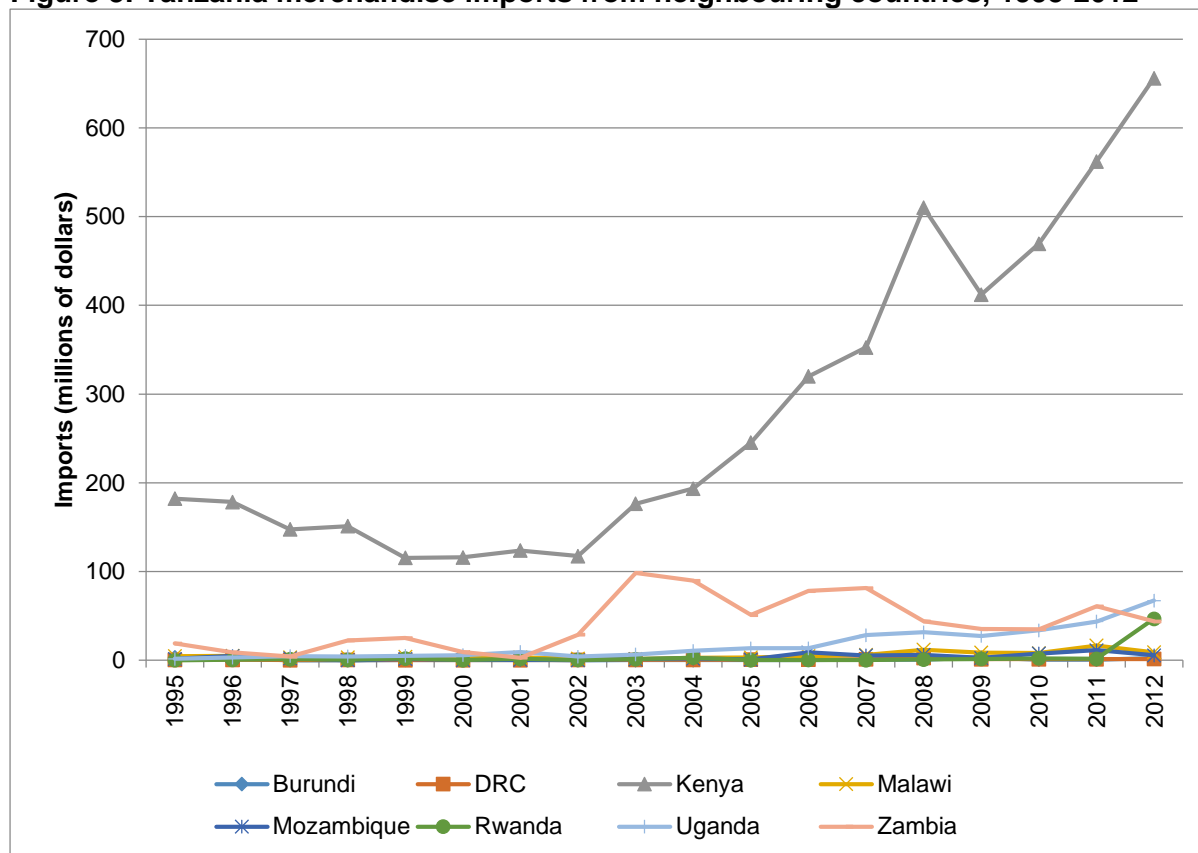
Figure 2: Tanzania merchandise exports to neighbouring countries, 1995-2012



Source: UNCTAD

Imports bound for Tanzania from its neighbouring countries have also increased, but are skewed to those from Kenya (albeit from a relatively low base) (Figure 3). Other countries are of minor importance and Zambia has even declined in importance over the past decade. This is consistent with the great majority of Tanzania’s imports coming from deep sea sources. Indeed, the data show that Tanzania’s major import partner in Africa is South Africa (by sea), with the majority of trade volumes taking place between Tanzania and countries outside of the region.

Figure 3: Tanzania merchandise imports from neighbouring countries, 1995-2012



Source: UNCTAD

Overall, we note the following with regard to Tanzania's trade with other countries:

- Top 5 commodities exported by Tanzania: Gold, precious metal ore, manganese ores, coffee, raw tobacco
- Top 5 commodities imported by Tanzania: Refined petroleum, wheat and meslin, motor vehicles, transport equipment, palm oil¹⁵
- Top 5 export destinations of Tanzania: Switzerland, South Africa, China, Germany, Japan
- Top 5 import origins of Tanzania: India, South Africa, United Arab Emirates, Switzerland, China.¹⁶

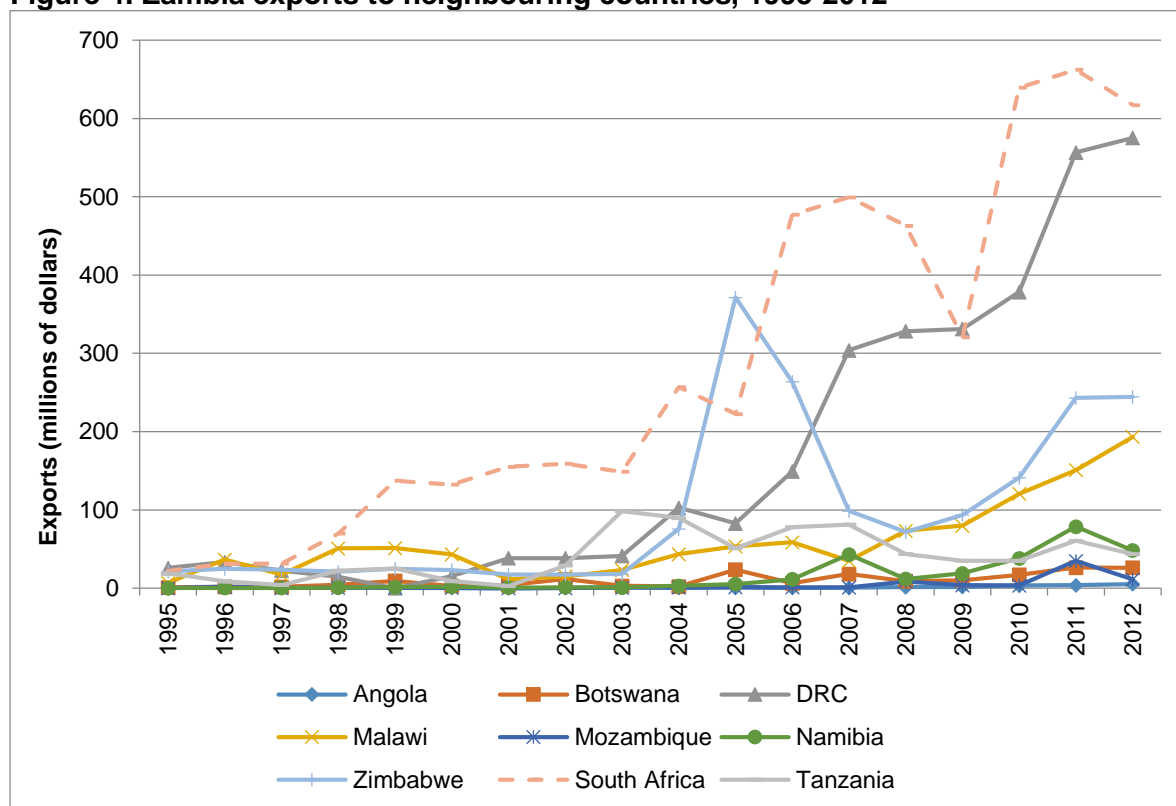
Zambia's imports and exports have also increased dramatically over the past ten years, including with countries in the region (Figures 4 and 5). We note that the level of exports, particularly to neighbouring countries (e.g. DRC) has increased substantially in the period from 2005/6. While South Africa 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 Lusaka 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

¹⁵ UN Comtrade country report

¹⁶ <http://atlas.media.mit.edu/profile/country/tza/>

manufactured goods (Figure 4). For Zambia, it remains the case that the majority of trade is transported via road transport, consistent with Raballand (et al, 2007) who stated that 70% of trade volumes were carried by road.

Figure 4: Zambia exports to neighbouring countries, 1995-2012



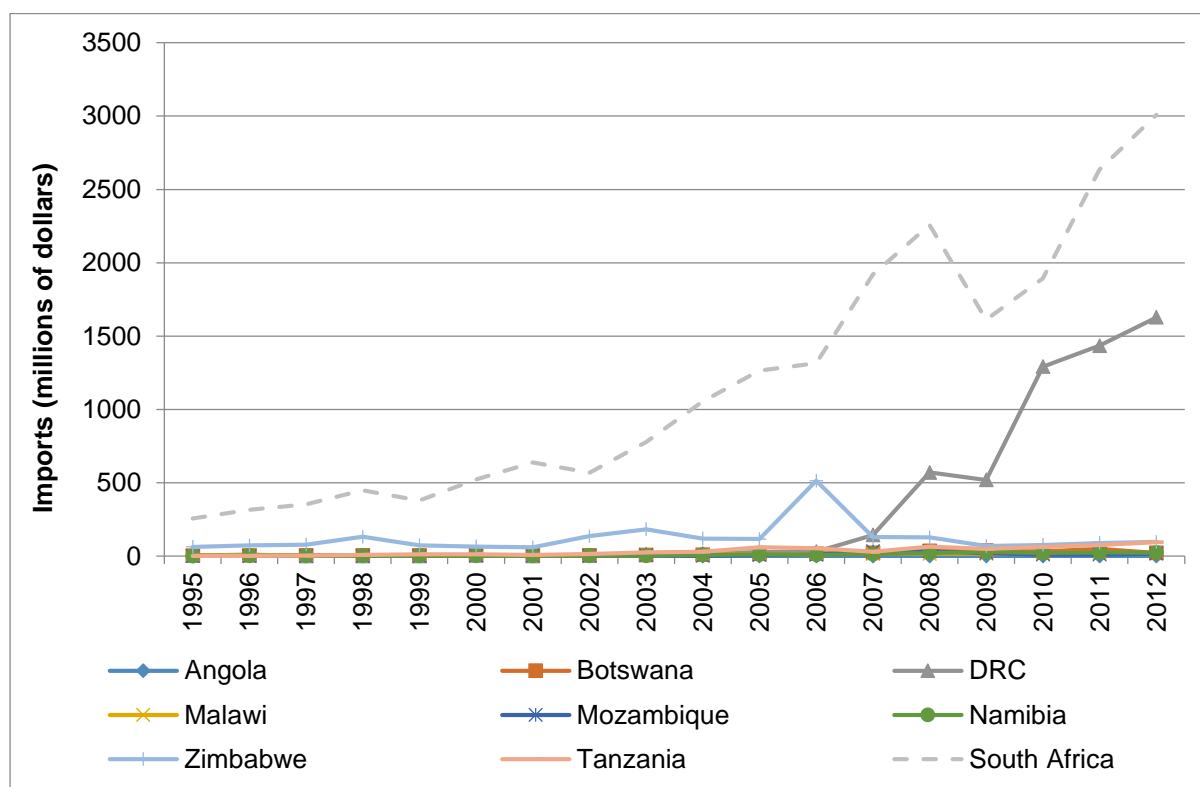
Source: UNCTAD

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 post-war 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. Zambia has earned an increasing amount of revenue from its primary export, which has led to an increase in domestic incomes and the availability of foreign currency to purchase more imports. For instance, the world copper price reached a record high of \$10179.50/ton in February 2011 having dropped to a record low of \$1318.25/ton in November 2001.¹⁷

The growth in imports has been mainly from South Africa, followed by large increases also from the DRC (Figure 5). Combined with the export flows, this means a major change in the volumes of road freight activity along the major routes in the region, including with neighbouring countries such as DRC, Zimbabwe, and Malawi in terms of exports (outgoing trucks through the relevant major border), and DRC in terms of imports (incoming trucks through the relevant major border). This increased flow in road freight traffic along these routes was confirmed in the interviews conducted. The surge in trade with the DRC since approximately 2006 is perhaps the single biggest regional development, mainly driven by significant (relative) increases in the imports of ores and metals from the DRC and exports of all food items and manufactured goods to the DRC.

¹⁷ www.tradingeconomics.com

Figure 5: Zambia imports from neighbouring countries, 1995-2012



Source: UNCTAD

Taken together, these trends have substantially grown the flow of freight along the routes to South Africa, especially the growth in the southern flow of goods, from DRC through Zambia and Zimbabwe to South Africa, and its main Durban port. Increased exports to Malawi have been of food items and manufactured goods, and similarly for exports to Zimbabwe.

While there has been greater regional trade, it is notable that by far the largest source of imports is China, while most exports also go to deep sea destinations (reflecting the importance of copper). Zambia also imports copper from the DRC which is then included in Zambia's exports. The following are Zambia's most significant trade partners and products:

- Top 5 commodities exported by Zambia: Refined copper, maize, copper plating, cobalt, copper wire
- Top 5 commodities imported by Zambia: Copper ores and concentrates, refined petroleum, motor vehicles, crude petroleum, machinery and equipment¹⁸
- Top 5 export destinations of Zambia: Switzerland, China, South Africa, DRC, South Korea
- Top 5 import origins of Zambia: China, South Africa, DRC, Switzerland, Kuwait.¹⁹

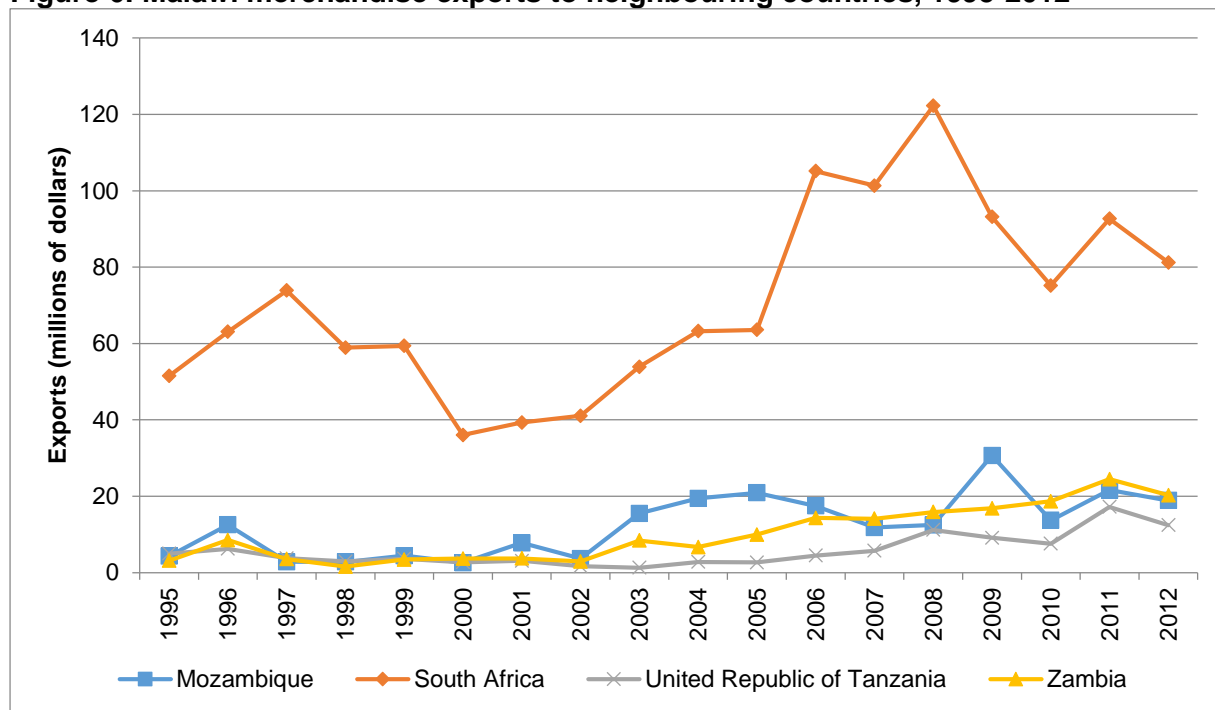
Malawi's trade has also increased although not to the same extent as for Tanzania and Zambia reflecting the fact that its economy has not grown as rapidly (Figures 6 and 7). South Africa is Malawi's top trade partner in the region and the single largest source of Malawi's imports. Imports, in particular, have increased strongly over the past decade (Figure 7). Exports to

¹⁸ UN Comtrade country report

¹⁹ <http://atlas.media.mit.edu/profile/country/zmb/>

Zambia and Tanzania have increased in the last few years, albeit from a very low base. Malawi's exports to Tanzania have largely been driven by an increase in the exports of food, particularly oil seeds, sugar and molasses. Malawi's exports to Zambia have largely been driven by an increase in manufactured goods, although these volumes remain very small.

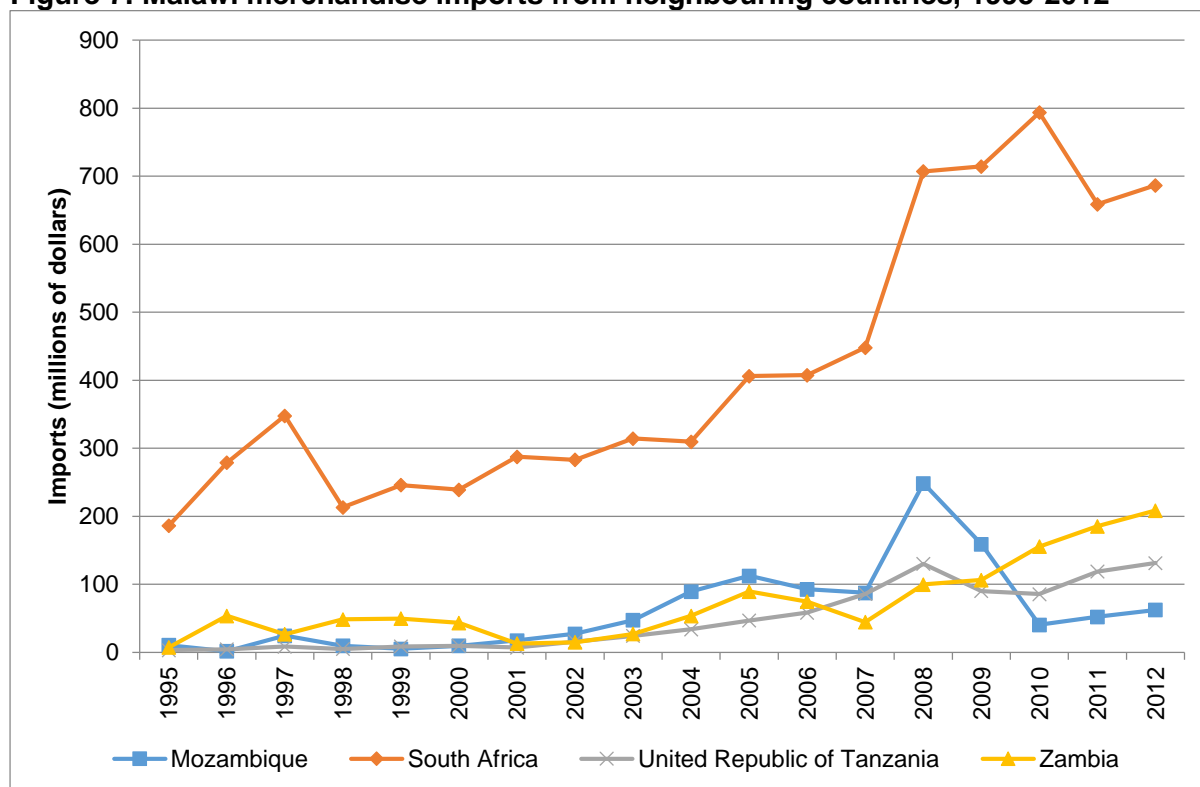
Figure 6: Malawi merchandise exports to neighbouring countries, 1995-2012



Source: UNCTAD

Similarly imports from Zambia and Tanzania have been on the rise in recent years (Figure 7). This could be attributed to the increase in economic growth that Malawi has experienced in the last few years. The largest imports from Tanzania are of manufactured goods and in trade with Zambia the drivers of imports are beverages and manufactured goods.

Figure 7: Malawi merchandise imports from neighbouring countries, 1995-2012



Source: UNCTAD

In terms of Malawi's trade patterns with all countries, we note the following regarding its most significant trade partners:

- Top 5 commodities exported by Malawi: Raw tobacco, raw sugar, tea, uranium and thorium ore, maize
- Top 5 commodities imported by Malawi: Refined petroleum, nitrogenous fertilizers, packaged medicaments, wheat and meslin, raw tobacco²⁰
- Top 5 export destinations of Malawi: Canada, South Africa, Zimbabwe, Germany, USA
- Top 5 import origins of Malawi: South Africa, India, China, Zambia, USA.²¹

The sustained and very substantial increases in trade flows on the part of Tanzania, Zambia and Malawi 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. However, if there are constraints in terms of the supply of trucks, entry of additional participants into the market, and bottlenecks at borders and ports then increased demand would imply higher freight rates. The analysis of each country considers these possibilities.

²⁰ UN Comtrade country report

²¹ <http://atlas.media.mit.edu/profile/country/mwi/>

The role of rail transportation and competition between ports

It is widely accepted by market participants including trucking companies that the presence of a more efficient rail system to the ports (especially to Dar es Salaam from Zambia) would significantly reduce the prices of transport services. This is especially the case for bulk goods such as coal, fertilizer, oil and maize.²² For example, a single train is able to carry approximately 1400 tons of goods (equivalent to almost fifty 30-ton trucks), meaning a lower rate per ton due to scale and distance economies.

The reliance on road freight is thus partly related to the challenges with the rail network. Briefly, Zambia's rail transport network consists of two systems: 1) Zambia Railways Limited (ZRL) which gave its network to Railway Systems of Zambia (RSZ) under a twenty-year concession in 2003;²³ and, 2) Tanzania Zambia Railways (TAZARA) owned by the governments of both countries. The rail system in Zambia is apparently inadequate and in some places non-existent (IFDC, 2013a: 29). The Tanzanian portion of the TAZARA rail network is also not functioning well.

This is expected to change as the governments in Tanzania and Zambia are each involved in projects to improve rail infrastructure. For instance, the TAZARA railway signed a \$42 million deal with the Chinese government which will enable Chinese companies to upgrade TAZARA rail networks, and another \$4.13 billion railway project between Tanzania, Rwanda and Burundi is in the financing stage.²⁴ Similarly, Grindrod will be making an investment of \$1 billion in a railway line from Chingola in the Zambian Copperbelt to the Angolan border through its Mauritian subsidiary, Grindrod Mauritius, in partnership with Zambia's Northwest Rail Company.²⁵ The Zambian government has also awarded tenders to 32 local firms to assist with upgrading its railway network in light of increased traffic (which has apparently tripled) to the Copperbelt region in response to increased mining activities.²⁶ In Tanzania, the World Bank has just recently approved a \$300 million project to improve Tanzania's central corridor and intermodal transport system by upgrading and expanding rail infrastructure linking the country to its neighbours.²⁷ This project is being coordinated in partnership with the Tanzanian government to assist it with its efforts to rebuild rail transport in the country.

Improvements in rail do not necessarily mean that road freight volumes will fall, given the current growth trajectory. However, interviews in Tanzania and Zambia suggested that there was strong opposition from truck owners to the rehabilitation of the TAZARA railway line as it could potentially drive down bulk transport rates (especially where these rates are above

²² Interview with Zambia Customs and Forwarders Agents Association (ZCFAA)

²³ Based on publicly available information, this concession has since been revoked and ZRL resumed control over the network in 2012 because RSZ had apparently failed to invest in maintenance which led to several derailments, high tariffs and poor service provision. See 'ZRA takes charge as Zambian concession revoked' (13 September 2012), *Railway Gazette*, at: <http://www.railwaygazette.com/news/policy/single-view/view/zrl-takes-charge-as-zambian-concession-revoked.html>

²⁴ See 'Tanzania, Zambia to invest \$80 million in cash-strapped rail firm' (8 July 2014) at: <http://www.theafricareport.com/East-Horn-Africa/tanzania-zambia-to-invest-80-mln-in-cash-strapped-rail-firm.html> and 'Fast central corridor pace urged' (16 April 2014) at: <http://www.dailynews.co.tz/archive/index.php/local-news/30388-fast-central-corridor-pace-urged>

²⁵ See Cokayne, R. 'Grindrod stocks soars on Zambian rail deal' (4 February 2014), *Business Report*, at: <http://www.iol.co.za/business/companies/grindrod-stock-soars-on-zambian-rail-deal-1.1641335#.U2NYnKMaJYc>

²⁶ See 'Railway tenders to Zambian locals' (10 April 2014), at: <http://www.transportworldafrica.co.za/2014/04/10/railway-tenders-to-zambian-locals/>

²⁷ See 'World Bank approves funding for Tanzanian transport network' (30 April 2014), at: <http://www.transportworldafrica.co.za/2014/04/30/world-bank-approves-funding-for-tanzanian-transport-network/>

competitive levels). In addition, despite the proposed construction of rail networks to Angola from Zambia, and to Burundi and Rwanda from Tanzania, these are not the primary trading routes for these countries at present although they could be in the future.

Competition between different ports

Zambia and Malawi can use different ports, treating them as competing options. The main port has been Durban, followed by Dar es Salaam, while Beira and Nacala are closer and with improved infrastructure are becoming more attractive.

Previous studies have found that the Dar es Salaam port is one of the best performers in the SADC region (McKinnon, 2012; PWC, 2012). However, it is also riddled with problems, including high levels of congestion at the port (SCEA, 2013). The main transport corridors from Dar es Salaam are the Central Corridor which links Tanzania to Burundi, Rwanda, Uganda and the DRC, and the corridor through Zambia to the DRC (McKinnon, 2012).²⁸ Comparing port efficiency (measured using the number of days of cargo dwell time) at Dar es Salaam versus Kenya's Mombasa port, although the Dar es Salaam port had improved its relative performance between 2011 and 2012, it still averaged 10 days to the 5 days in Mombasa (SCEA, 2013). These outcomes are still far above the accepted standards of maximum 3 days' dwell time (SCEA, 2013).

Relative port efficiency is one reason why the route from Durban remains attractive and the most important one for Zambia, although the distance is marginally further than Dar es Salaam (Durban is 2143km from Lusaka, while Dar es Salaam is 1951km away).²⁹ While the costs are similar for handling and clearance at the Durban and Dar es Salaam ports, the turnaround time at the Durban port is far shorter than in Dar es Salaam, partly due to the limited number of berths and equipment at Dar es Salaam.³⁰ The attractiveness is also due to the substantial flow of goods in both directions which allows truck operators to obtain significant backhauls to offset the additional transport costs. Furthermore, as a regional hub the port has a high 'vessel calling frequency', although this status was also being attained by Dar es Salaam and Walvis Bay (but not Beira and Maputo) (Raballand, 2007).

In Durban there is also access to a wider range of trucking companies and at the actual port forwarders could generally clear goods within only 48 hours.³¹ Although the demurrage charges are similar in Dar es Salaam and Durban, the Dar es Salaam port did not have sufficient equipment and importers are therefore more likely to incur demurrage charges.

Beira has not attracted significant traffic to and from Zambia because it is mainly a feeder port to Durban with few direct calls (partly because it only has an 8 metres draft) (Raballand et al, 2007: 8). However, the port is much closer to Lusaka as well as Lilongwe in Malawi at approximately 1000km away and it does seem that the port has become increasingly more competitive. Nacala which is the alternative port in Mozambique, has a higher docking capacity and is the closest to Lilongwe, however, it is plagued by slow operations and a slow rail

²⁸ Argent & Milanovic (2014: 5) found that the Central Corridor is dominated by Tanzanian firms mainly through discriminatory application of road tolls which have undermined the competitiveness of Rwandan trucking companies. For example, Rwandan trucks previously paid road tolls of \$500 per trip to Dar es Salaam whereas Tanzanian firms only paid \$152.

²⁹ Interview with Hill & Delamain and Customized Clearing and Forwarding Ltd.

³⁰ Interviews with Hill & Delamain.

³¹ Interview with Hill & Delamain.

service. Greenbelt Fertilizers in Zambia stated that the route from Beira provides significant cost advantages to them in terms of road freight costs due to the efficiency and availability of trucks. Importantly, the company noted that although port handling is cheaper at the Dar es Salaam port at \$42-45 per ton compared to \$52-55 per ton at Beira, the significant problems they have encountered in terms of theft along the route through Tanzania has meant that they prefer to use the Beira port. This is also despite the fact that the Beira port is highly congested (especially in the peak periods from October to November each year) and delays at the port can be very lengthy. Therefore, the combination of a shorter distance, better conditions and reduced road freight costs has seemingly made Beira an increasingly more attractive option user.

There are plans to construct a new fertilizer terminal valued at \$30 million at the Beira port in order to redirect fertilizer imports intended for Zambia and Zimbabwe from going through Durban, to using the Beira port.³² This is likely to increase the attractiveness of the Beira port to fertilizer companies. This would also place Beira in direct competition with the Dar es Salaam port where there are terminals for 'breaking bulk' operated by Dar es Salaam Corridor Group (DCG), the port authority, and now Yara (for fertilizer) as well (discussed below).

The border gate through which goods pass also matters when comparing routes from different sea ports. Transporting goods through the Chirundu border (Zimbabwe - Zambia) is apparently much faster than through Nakonde from Tanzania, which adds to the attraction of Zambia and DRC trade going south to Durban over north-east to Dar es Salaam. 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 2 days to clear customs procedures, whereas clearance used to take up to 21 days some years prior to this.³³ Finally, we note that although Walvis Bay is gaining significance as a port for supplying goods to Zambia, it remains expensive. However, there have been increased volumes,³⁴ including for DRC exports destined for the USA through Walvis Bay, as the shipping route is more direct.³⁵ Despite this it was noted that the problem with the route was that it was difficult for trucking companies to secure return loads.

Overall, Durban remains the most important port and the volumes of road freight on the routes from the port to Zambia and Malawi have grown very substantially. This reflects the greater efficiencies compensating for the longer distances. It does seem that transporting goods via Beira is becoming an attractive option, particularly for the shorter distances to Malawi and Zambia, and is likely to offer greater competition to both Dar es Salaam and Durban over time. Nacala may also become an attractive option over time although significant improvements would have to take place to improve efficiencies. This may have an increasing effect in future but the effect over the period we are examining has been very limited. Walvis Bay has yet to become a viable option for users, although it is likely to grow in significance going forward. The fact that users already seem to consider the ports as competitive alternatives to one another suggests that a continued growth in the levels of competition between ports could lead to improved competitive outcomes for users of port services, and road freight.

³² See 'Goods to hinterland via Beira not Durban' (24 January 2014), at: <http://www.transportworldafrica.co.za/2014/01/24/goods-to-hinterland-via-beira-not-durban/>

³³ Interview with Customized Clearing and Forwarding Ltd.

³⁴ Interview with TruckAfrica (subsidiary of Imperial Holdings Limited)

³⁵ Interview with Hill & Delamain.

3 Value chain arrangements in fertilizer distribution

There is generally low fertilizer usage in Sub-Saharan Africa with 69% of total fertilizer consumption in Africa taking place in three countries – Egypt, South Africa and Morocco (Africa Fertilizer Organization, 2012: 5). Nonetheless, it is the intention of several governments in Africa to increase the usage of fertilizer in their countries through various means, including subsidy programmes, and so it is important to assess the methods by which the commodity is distributed in each of the study countries and to understand the cost build-up.

The main factors affecting fertilizer supply and usage in Sub-Saharan Africa have been identified by Gregory & Bumb (2006) as:

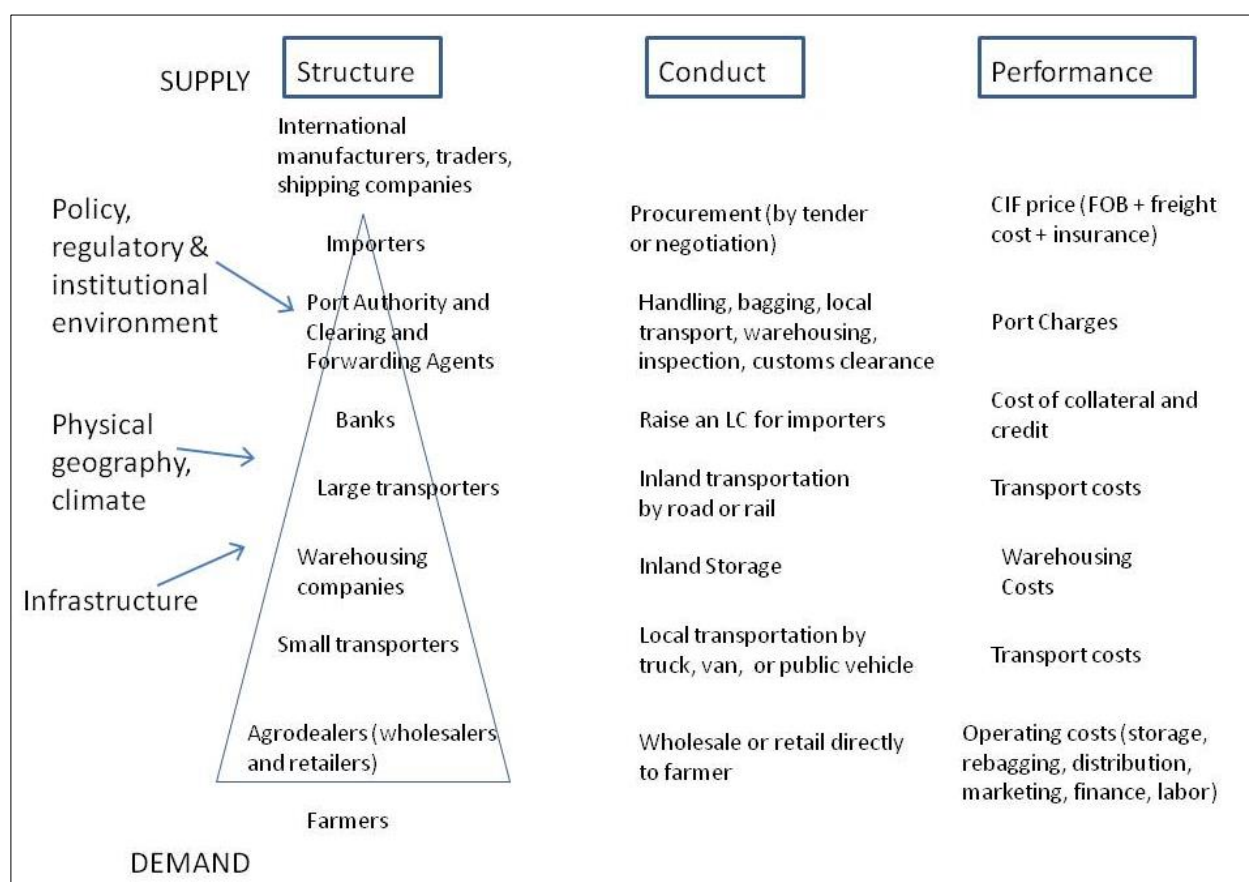
- Market development constraints: uncertain policy environment, inadequate human capital, limited access to finance, lack of market information and data, weak regulatory systems, small size of domestic markets results in no scale economies, and unnecessary product differentiation in already small markets.
- Technical constraints: limited farmer knowledge on the correct use of inputs.
- Infrastructural constraints and related costs: in many countries such as Zambia the main highways and inter-city routes are well-maintained while the side roads linking to rural nodes are not. This adds to transport times and costs. Landlocked countries also incur between \$50-\$100/ton for transporting goods between their borders and ports. (We provide updated estimates in sections to follow).³⁶

For our study, the most relevant of these factors are those dealing with infrastructure and transport costs. As discussed, 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 fertilizer specifically, we are able to discuss the price of road freight *relative* to the price of fertilizer 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 fertilizer trading.

A large amount of the fertilizer consumed in Africa, including in the countries being studied, is imported. The following depiction of the domestic value chain for fertilizer is helpful for understanding the important linkages between fertilizer importers and logistics systems which ultimately deliver fertilizer to the farmers (Figure 8).

³⁶ IFDC (2013) also considered related issues about infrastructure in Zambia arguing that in terms of the transportation of fertilizer, the efficiency of delivery was affected by long haulage distances over poor roads from Beira, Dar es Salaam and South African ports, numerous weighbridges, and roadblocks.

Figure 8: The domestic value chain for fertilizer



Source: Africa Fertilizer Organization, 2012

For the purpose of this study, it is useful to simplify the value chain for fertilizer to three main stages:

- Processing of bulk or containerised fertilizer at the port of entry, including inspection, bagging, and customs clearance.
- Transporting the fertilizer from the port to importers' warehouses within the importing country, including once the product has moved cross-border to, for example, warehouses in Zambia from Dar es Salaam. (We expect that the additional cost of transit transportation and further domestic transportation within Zambia and Malawi as landlocked countries would be reflected in the difference in the price of fertilizer between Tanzania and these two countries).
- Transporting the fertilizer from these warehouses to the end-users or depots, retailers, and agro-dealers close to the farmer.

Our analysis in the chapters to follow therefore considers the domestic transport rates and competition within countries (such as transporting fertilizer 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 on an arms-length basis. The ability to be an effective competitor at the trading level, however, requires being able to undertake this bundle of functions cost effectively.

The study addresses two overarching questions with regard to the road transportation and trading of fertilizer, specifically:

- How do the prices of fertilizer as our representative bulk commodity compare across countries, over time, and to estimated benchmarks of competitive and efficient supply?
- Can differences in the price of fertilizer 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 fertilizer trading, including due to weak inter-firm rivalry and relatively uncontested markets?

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

Trends in the prices of fertilizer

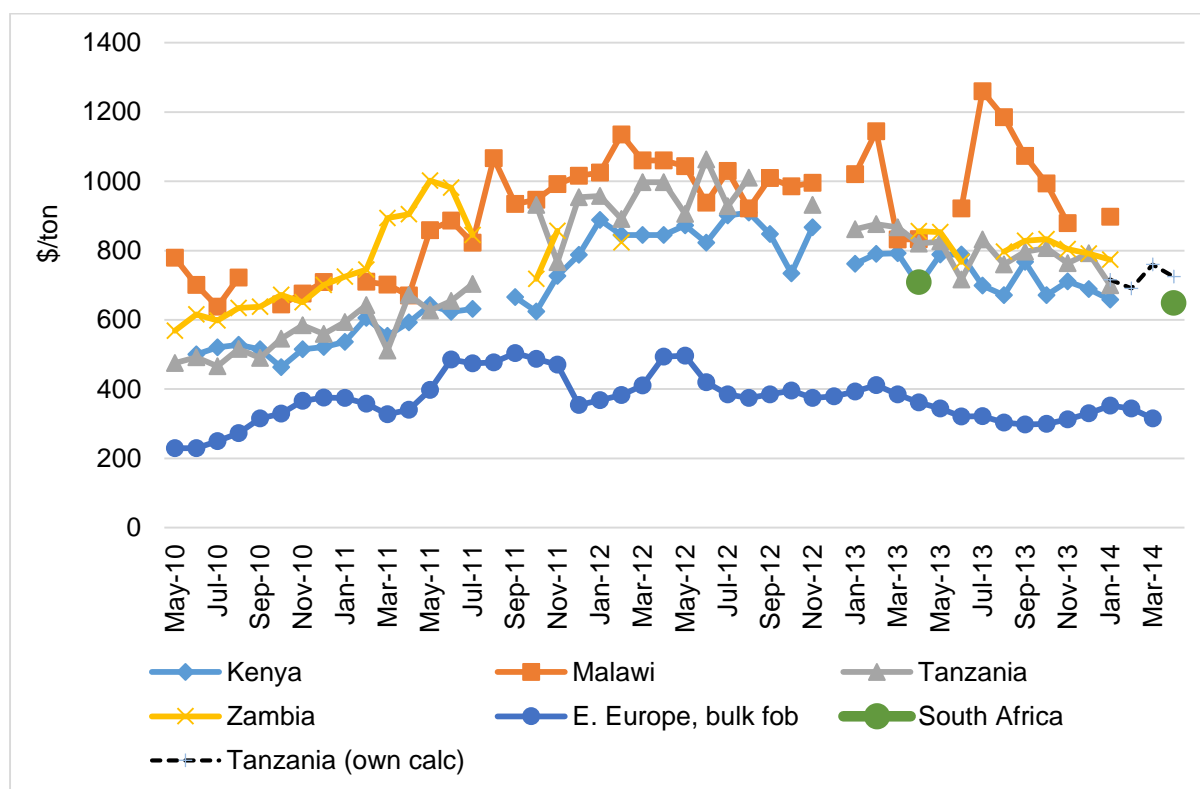
We begin by considering comparative prices for Urea and Calcium Ammonium Nitrate (CAN)³⁷ for the period May 2010 to January 2014, the period for which data was available (Figures 9 and 12). Urea and CAN have been chosen as good products to compare across the countries due to the availability of data 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 and Zambia are landlocked. We also benchmark these prices against a major international source for fertilizer, the Black Sea FOB price. The pricing data reflect the national average prices in each country derived from monthly agro-dealer/retailer-level surveys.³⁸

First, a general observation is that throughout the period there is a significant gap between the international benchmark price and those 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 over the FOB prices (that is, the prices paid to source imported fertilizer). 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 10).

³⁷ Also known as Limestone Ammonium Nitrate (LAN).

³⁸ AMITSA compiles the data by conducting surveys in each of the major agricultural towns (key agricultural production areas) in a country, as well as the capital. 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 from the field-level for those months.

Figure 9: Urea monthly (national average delivered) prices, 2010-2014³⁹

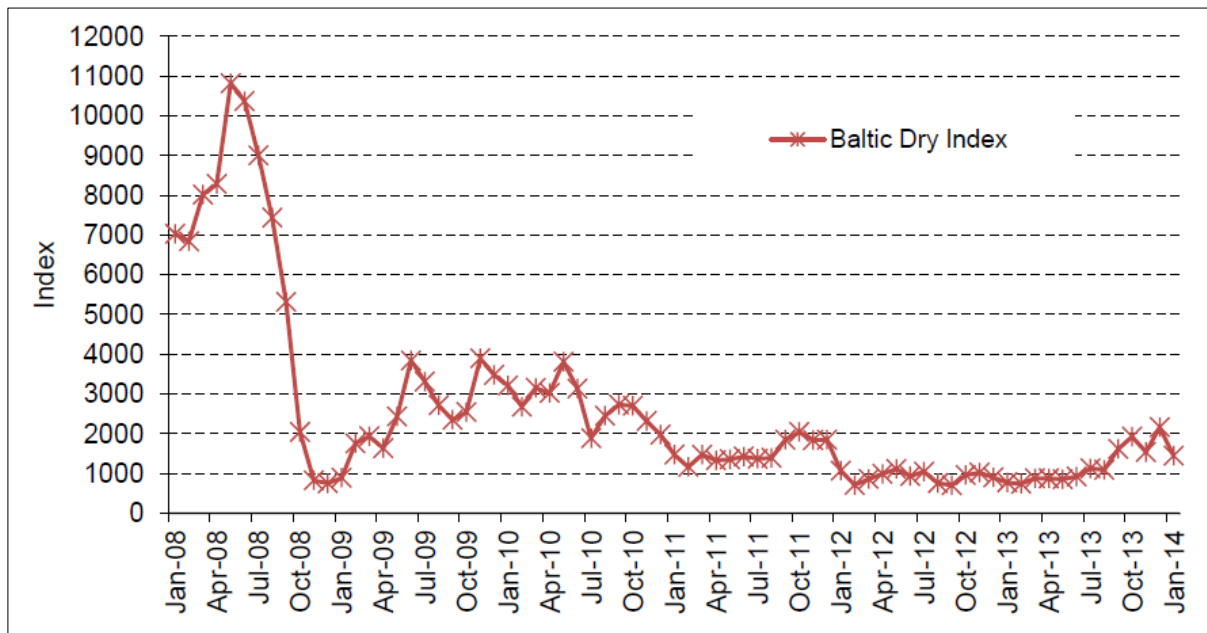


Source: www.amitsa.org ; www.grainsa.co.za for South Africa; World Bank (MIDAS)

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 12). 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 11). There are other possible explanations such as domestic factors, which we explore in greater detail below.

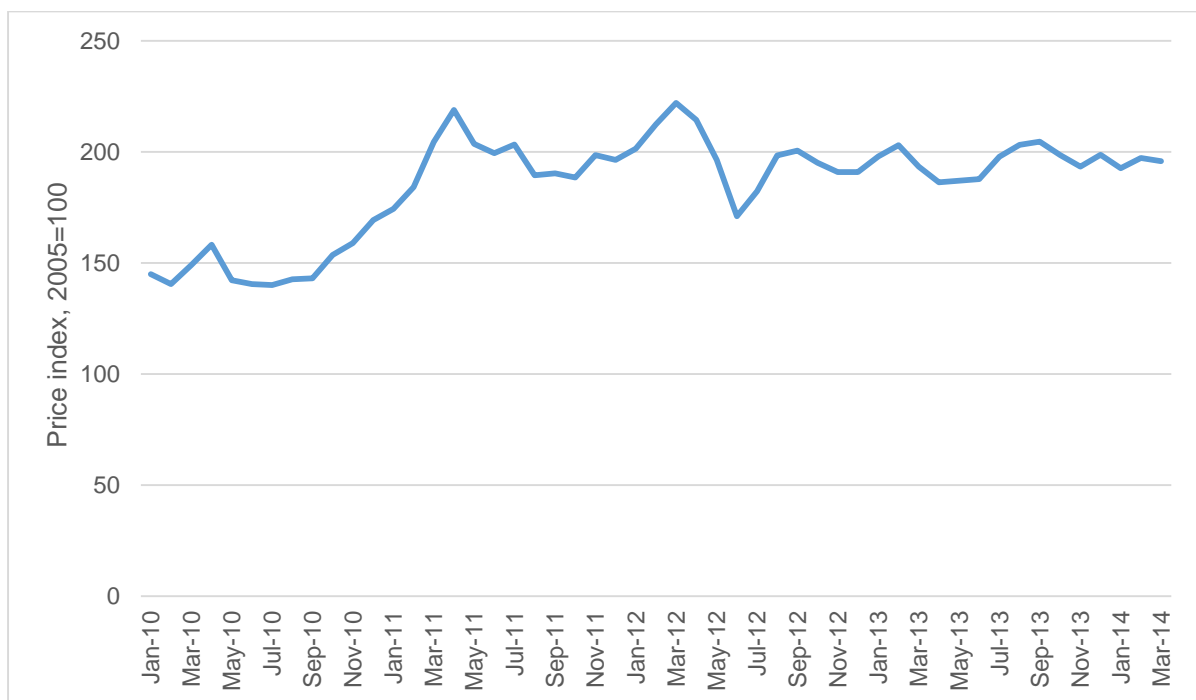
³⁹ We have removed outliers in the data where the value is different by more than 50% (absolute value) from the value in the previous or next month for which data is available. Malawi Urea prices showed an outlier of \$1179/ton in September 2010, and another outlier of \$355/ton in December 2013. Malawi CAN prices showed an outlier of \$1215/ton in September 2010. Zambian Urea prices showed an outlier of \$1702/ton in January 2012, and another outlier of \$1619/ton in June 2012. Zambian CAN prices showed an outlier of \$1477/ton in January 2012, and another outlier of \$1579/ton in June 2012. We also note that imports of fertilizer to Zambia peak in October, November and December annually which corresponds with the period over which fertilizer is generally distributed to the farming areas and when government imports the most fertilizer (see interviews with TruckAfrica and Greenbelt Fertilizers). This period corresponds with the findings by the IDFC (2013) that imports of fertilizer (under the Zambian subsidy programme) mostly take place between September and November and are largely distributed to farming areas over the following 6 weeks.

Figure 10: Baltic Freight Index, 2008-2014



Source: SAGIS in National Agricultural Marketing Council of South Africa (NAMC), February 2014⁴⁰

Figure 11: Crude Oil Price index



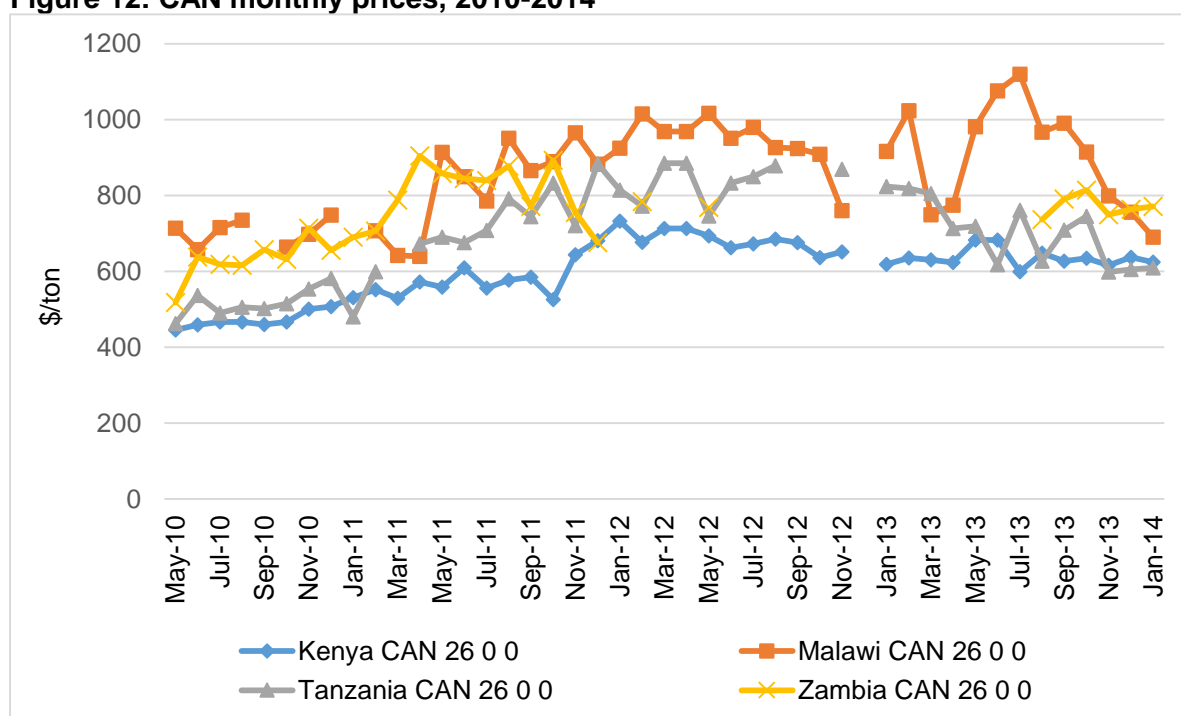
Source: www.indexmundi.com

⁴⁰ 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 coastal countries of Tanzania and Kenya. 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 cost that is required to take fertilizer from the ports to the Zambian end-user.

Fourth, Malawi prices remain substantially above the prices in other countries, while Tanzania prices also 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 13% in 2012 and 11% in 2011. In this context, South Africa is also an interesting comparator because Zambia imports fertilizer 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.⁴¹

Figure 12: CAN monthly prices, 2010-2014



Source: www.amitsa.org

We compare the average annual prices of Urea in Kenya, Zambia, Tanzania and Malawi for the period 2010 (from May) to 2013 (Table 2). We also indicate the mark-ups (in italics) of Kenya, Zambia and Malawi over a) Tanzania prices (blue) and b) the Black Sea FOB

⁴¹ See www.grainsa.co.za. South African local prices converted using monthly exchange rate available at: <http://www.oanda.com/currency/historical-rates/>

benchmark price (red). We do not calculate average prices for Zambia for 2012 given the very small number of data points.

Table 2: Average annual fertilizer (Urea) prices and international fob prices⁴²

	Tanzania	Malawi	Zambia ⁴³	Kenya	Avg. Black Sea FOB (Urea)
2010 (May-)⁴⁴	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 moved to be 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 fertilizer 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 fertilizer 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 coastal country with a major port. 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.⁴⁵ Note that the South African price includes local delivery transport across

⁴² Note that slight discrepancies in the mark-ups calculated are due to rounding.

⁴³ There are only two data points for 2012 for Zambia and so we do not compute an annual average.

⁴⁴ For 2010 we average data from May to December which corresponds to the months for which national average fertilizer prices were available.

⁴⁵ Interview with TruckAfrica. This was the rate at which they stated that they could break-even on a trip from the Copperbelt to Johannesburg.

the country so it is as if we are moving the country inland by the Johannesburg to Lusaka transport.

Table 3: Port and landlocked country price benchmarks, 2013

Competitive coastal country fertilizer price	\$709 per ton (South Africa)
Competitive transport rate	\$110 (Johannesburg to Lusaka)
Competitive landlocked fertilizer 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 4). 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 \$150/ton to \$200/ton.

Table 4: Mark-ups over benchmark competitive prices by country, 2013

Country	Average fertilizer 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' country with a major port and landlocked country, respectively. Effectively, the calculated mark-ups represent the portion of the difference between the costs of fertilizer 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.

The process of importing fertilizer and the composition of fertilizer prices

The process by which fertilizer is imported into the Dar es Salaam port provides a good illustration of how fertilizer imports are handled at a port as well as the accumulation of costs and margins along the whole value chain. It is important to understand each level of the value chain in order to distil the areas where improvements can be made to ultimately reduce the cost of fertilizer to farmers, including recommendations for reducing the costs of logistics services. The analysis also highlights how the improved access to facilities for fertilizer companies can result in lower costs and more competition.

Fertilizer arrives at the Dar es Salaam port mostly in bulk which must then be separated and packed into 50kg bags that are then 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.⁴⁶ To expedite the handling of fertilizer a private terminals were introduced by the Dar es Salaam Corridor Group (DCG) which was established in 2004.⁴⁷ DCG's facilities, which are available just outside the port, are used to offload fertilizer ('break bulk'), facilitate clearance procedures, move the fertilizer out of the port area and bag the product for the importer. Our understanding is that when the bagging of fertilizer is done by DCG, they can discharge about 3000 tons per day versus 1500 tons by the port authority.⁴⁸ These facilities for breaking dry bulk have improved efficiency at the port.

Based on the interviews, several factors can affect the accumulation of costs from when the fertilizer is purchased from an international source, to the bagged 'ex-port' or warehoused cost, including:

- The volumes imported in a given consignment. For instance, the Tanzania Fertilizer Company (TFC) noted that because they do not purchase large volumes compared to their competitors, they are not able to buy directly from large suppliers globally, and are forced to buy through traders. This implies that they are not able to obtain some of the discounts available to their competitors. Furthermore, large competitors such as Yara are able to buy products from within the Yara group which places them in an advantageous position – although this apparently also constrains Yara from buying from cheaper sources outside the group.⁴⁹
- Where fertilizer is imported in bags, the importer is able to transport it directly to its warehouses. Alternatively the importer makes arrangements to have the bulk fertilizer bagged at the port. The availability of terminals at the port is important in this regard. For example, the DCG terminal seems to be more efficient than the port authority which reduces costs for the importer, and the Yara terminal will provide the same cost advantages but these will be limited to Yara's own shipments and not competitors. Interestingly, we understand that Export Trading Group (ETG) has facilities at their warehouse outside the port (approximately 20kms away) which enable them to take bulk fertilizer (un-bagged) and bag it for themselves at the warehouse. As we show below, this seems to result in cost savings for ETG.
- Large transporters take the fertilizer to importers' warehouses for storage. The cost of transporting fertilizer from the port to warehouses in Dar es Salaam on a 30-ton truck is estimated to be approximately \$9-10/ton.⁵⁰
- The importer's margin which the fertilizer company adds.

We have assessed the composition of fertilizer costs and prices in Mbeya (Tanzania), using Urea as the benchmark product. This is based on interviews with ETG, TFC, collating data for the first quarter of 2014, and a 2013 study by the Tanzania Fertilizer Regulatory Authority

⁴⁶ Interview with Jambo Freight Forwarders.

⁴⁷ Yara will be opening their own bagging facility which will only handle fertilizer while DCG's platform also handles other dry bulk goods.

⁴⁸ Interview with TFC.

⁴⁹ Interview with TFC.

⁵⁰ Interviews with STACO and Jambo Freight Forwarders.

(TFRA) (Ngowi, 2013) (Table 5). 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, fertilizer is in high demand in this area 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, 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 ETG, who also do their own bagging).⁵¹

By comparison, the local transport and trading activities add around \$160 to get to a final (net) retail price for the fertilizer trader. The retail list price of the agro-dealer is substantially above this, based on the prices recorded at a town some 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 ETG 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, 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).

Table 5: Urea price composition in Mbeya, \$/ton⁵²

	TFC Q1 2014	ETG Q1 2014	TFRA (2013)	Benchmark
FOB	352	350	-	350
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
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)	882⁵³	882	757	882
National average retail list price (AMITSA)	720	720	810	720

Source: Interview data from ETG, TFC reflecting first quarter 2014 and Ngowi (2013)

⁵¹ 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 Greenbelt Fertilizers).

⁵² 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.

⁵³ Available AMITSA disaggregated monthly price data for Chimala which is 74km from Mbeya city (average of prices in January and March 2014)

The identification of around \$110 in excess charges in the price is also consistent with the very competitive ETG final retail price. Our assessment is that very recent moves to open up the market have allowed more competitive offerings. This includes better access to the port enabling a more contestable market. In effect, the developments we are seeing in early 2014 are consistent with the assessment of the mark-ups over 2011-2013 for Tanzania. In addition, the difference of ETG's 2014 final retail price with the FOB price of \$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 2.

These are significant differences, even though the final retail prices quoted in each interview are lower than the average national list price. This is most likely due to significant volumes purchased and discounting to large customers in intensive agricultural regions such as Mbeya. Nonetheless, this suggests that fertilizer prices in Tanzania are far above what farmers should be paying, 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.

With regard to transport costs, we note an apparent decline in the inland transport rate to Mbeya since 2011 which was \$65/ton (obtained from SUMATRA for 2011), suggesting high mark-ups in transport in 2011 which have been eroded away since then by \$22/ton in the case of the estimates provided by TFC in Table 5. This may be a result of relatively more competition in the Tanzanian road freight sector, at least in terms of the number of competitors in the market which has increased, as we discuss below. Regarding transportation, other mechanisms are available to further reduce the transport costs in Tanzania such as making improvements in infrastructure (see for example, Benson et al, 2012).⁵⁴

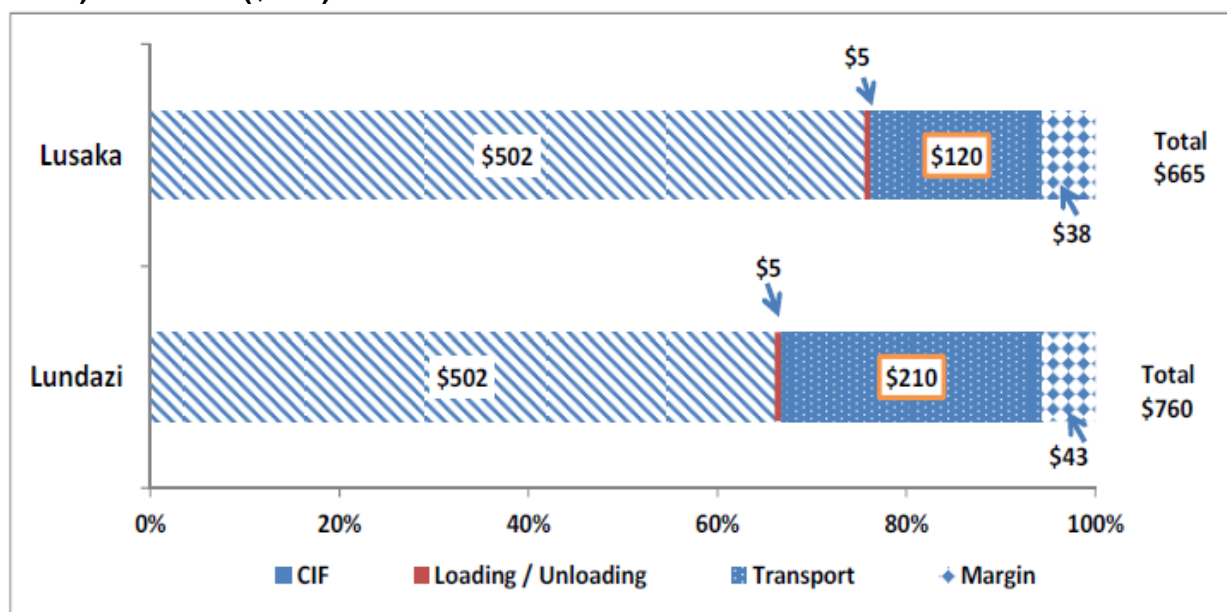
The apparent decline in the transport rate over time, while shaving \$22/ton from the cost benchmark, only serves to highlight how big the other additional margins appear to be. Once again, this may reflect a significant lack of effective competition at the wholesale level of the market. This accumulation of margins is likely to explain, at least in part, why prices in Tanzania are comparable to those in Zambia in 2013 despite the much longer distances and higher transport costs to supply fertilizer in Zambia.

A recent study on the composition of fertilizer prices in Zambia supports the tentative conclusion that there are issues with competition in Tanzania (IFDC, 2013a). Similar final prices⁵⁵ in Zambia of \$665/ton in Lusaka and \$760/ton in Lundazi are realized despite higher costs of landing, transport and delivery reflected in \$502/ton CIF prices in Beira and transport of \$120-\$210/ton associated with the distances and border crossing (Figure 13). Lusaka is 1048km from Beira, while the delivery to Lundazi is an additional 753km further. While the landed price in Beira is higher than Durban, this appears to be compensated by the shorter distances such that traders look at both Durban and Beira as sources for Zambia although most actually comes from Durban.

⁵⁴ Other suggestions included removing the 18% VAT on transport, as well as other minor levies (Interview with Shivalal Tank & Company, STACO).

⁵⁵ These compare with the average retail list prices of \$816/ton across Zambia in 2013 from AMITSA.

Figure 13: Contribution of transport costs to total price of D-Compound fertilizer (10-20-10) in Zambia (\$/ton)



Source: IFDC, 2013a

The prices in Malawi are much higher again, which we assess further in section 6 below.

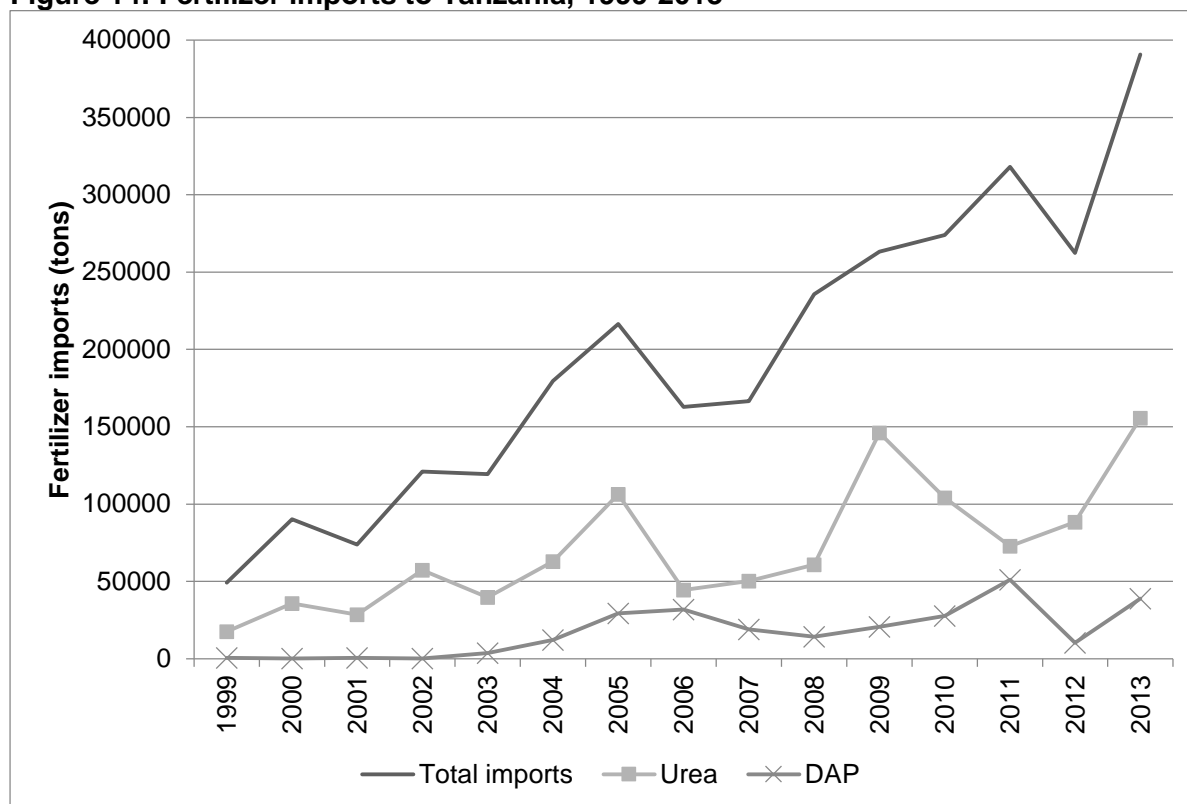
Imports and consumption of fertilizer in Malawi, Tanzania and Zambia

The majority of fertilizer to markets in Sub-Saharan Africa is imported, and most of the fertilizer imported to the countries considered in this study is transported by road. This section considers the level of imports and consumption of fertilizer in each country, beginning with Tanzania.

Total fertilizer imports to Tanzania have increased gradually over time (mostly from Europe and the Middle East), especially since 2007 (Figure 14). Urea and DAP, which are part of the subsidy programme in Tanzania, have increased since the introduction of the subsidy voucher system in 2008 (discussed below).⁵⁶ This is more so for Urea where there was a spike in imports between 2008 and 2009 although generally the increased imports of Urea have been in the form of erratic spikes rather than a smooth transition. While there was an increase from 2008, DAP imports are still far lower than those of Urea.

⁵⁶ Other imports are of NPKs (a blend of nitrogen, phosphorus and potassium) and Ammonium Phosphates.

Figure 14: Fertilizer imports to Tanzania, 1999-2013



Source: UN Comtrade Database

We note that some of the fertilizer imported to Tanzania is re-exported to neighbouring countries. We have calculated the approximate consumption of Urea in Tanzania between 2010 and 2013 as the difference between the imports and the re-exports. Therefore, the domestic consumption of Urea is thus even lower than what we have shown in figure 14.

Table 6: Consumption of Urea in Tanzania, 2010-2013

	2010	2011	2012	2013
Urea imports	104 104	72 817	88 282	155 533
Re-exports	15 711	23 632	25 767	17 011
Approximate consumption	88 393	49 185	62 515	138 522

Source: Tanzania Revenue Authority (TRA)

The data in Table 6 are, however, inconsistent with the amounts of fertilizer which are subsidised which was around 200 000 tons in 2013, and mostly of Urea. Data from the TFRA provide different numbers for apparent demand and for availability.

The data for Zambia also do not present a consistent picture in terms of fertilizer imports. Most imports are from South Africa and Egypt, and sources in the Middle East, and China. For instance, Zambia was the primary destination for South African fertilizer exports in 2011 and 2012, followed by Zimbabwe and Mozambique (Mostert, 2013).

IFDC (2013a) estimated the current total consumption of fertilizer in Zambia to be 250 000 to 300 000 tons, of which 200 000 tons is imported under the government subsidy programme discussed below. However, it seems unlikely that only 50 000 – 100 000 tons is imported for

the commercial market. Other estimates put the commercial market at around 230 000 with the total supply at around 430 000 tons.⁵⁷ This is closer to the trade data for 2012 and 2013 from Zambia Revenue Authority (Table 7). (Note that this does not account for re-exports.) Urea imports account for a significant proportion of the total.

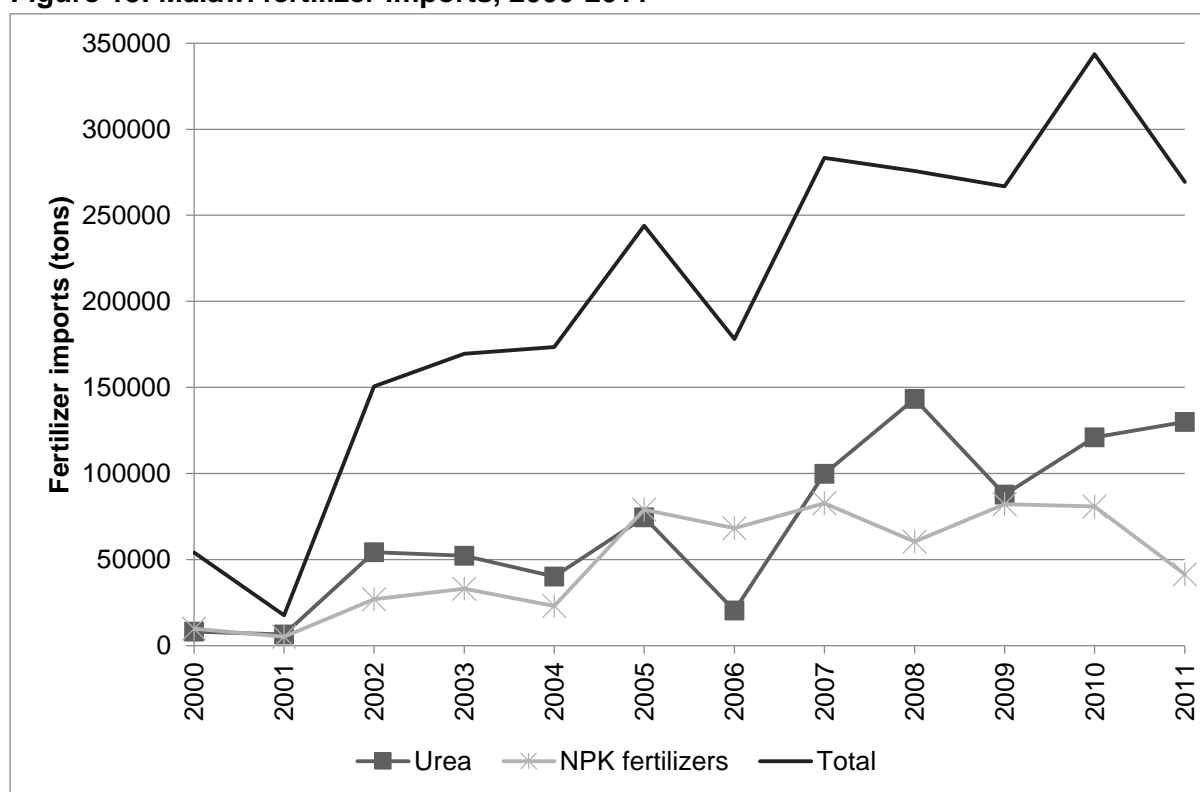
Table 7: Imports of fertilizer to Zambia, 2012-2013

	2012	Share of total	2013	Share of total
Urea imports (tons)	115 433	29%	188 061	35%
All fertilizer imports (tons)	397 333		544 495	

Source: Zambia Revenue Authority

Malawi also records strongly increasing fertilizer imports over the last decade (Figure 15). Urea and NPK blends have been the most important products, which at least partly reflects the fact that the fertilizer subsidy (which is discussed in a later section) provides coupons for the subsidised purchase of Urea and NPK. Urea is largely used by farmers as a top dressing while the NPK fertilizers are used as basal fertilizers (Likoya & Mangisoni, 2010). Urea imports to Malawi for 2013 were 183 661 tons (UN Comtrade data).

Figure 15: Malawi fertilizer imports, 2000-2011



Source: UN Comtrade Database

The levels of total imports in Malawi, Zambia and Tanzania are in the same range of around 250 000 to 400 000 tons in recent years. This is despite the fact that the arable and permanent

⁵⁷ Interview with Greenbelt Fertilizers.

cropland is much smaller in Malawi and Zambia at 3.73 million hectares and 3.4 million hectares, respectively, than it is in Tanzania whose comparable cropland is 13.3 million hectares (World Bank database, 2014). This suggests that fertilizer usage per hectare is far more intensive in Malawi and Zambia, although it is still lower than some recommend.

Based on the estimates of import volumes and average national prices above, we are able to calculate (roughly) the impact of relative price differences between these countries and comparators (Table 8). These calculations are based on the initial hypothesis that Tanzanian fertilizer prices should be substantially lower than those in Zambia and Malawi (landlocked countries) and comparable to those in Kenya; and that, other things equal, if transport markets in Malawi became more competitive, the prices for fertilizer in Malawi and Zambia would tend to be closer together, which they currently are not.

Just using the Urea import volumes and applying the average prices in 2013, we find that if prices had been the same in Malawi as in Zambia, there would have been a \$36.4 million saving in the cost of fertilizer to the country overall, other things equal. Similarly, if Tanzanian prices had been \$110/ton lower (as we estimated above) then there would have been a \$15.2 million saving just on Urea. Importantly, these savings would be more than double in some cases if we consider other types of fertilizer as well. The assessments of dynamics within each country's road transportation and fertilizer trading that follow highlight issues which can affect these outcomes.

Table 8: Comparison of average national retail prices, volumes and mark-ups in Urea imports, 2013

	Tons Urea 2013	Average \$/ton 2013	Difference against benchmark	Difference (\$mn)
Malawi	183 661	1014	\$202 (Zambia)	36.4
Tanzania	138 522	810	\$110 (Zambia/South Africa)	15.2
Zambia	188 061	816		

Source: Own calculations

Market structure and arrangements in fertilizer distribution in Malawi, Tanzania and Zambia

This section outlines the main fertilizer 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 fertilizer trading in the region consists of a small number of large importers that operate in more than one country, namely Yara, Omnia, Nyiombo and ETG, as well as a few significant domestic importers in each country. Within each country, we therefore observe largely oligopolistic markets of three to four major players. The nature and intensity of competition between these players therefore matters greatly for market outcomes, as well as whether the market can be effectively contested by smaller rivals and entrants. For example, in Zambia the market has traditionally been dominated by Omnia and Nyiombo although the entry of ETG and the continued growth of Greenbelt Fertilizers has meant increased competition in the market. In Tanzania, the entry and growth of ETG appears to reflect greater competition (evidenced by a high growth in market share for ETG with competitors losing out) suggesting that at least some portions of the market have become contestable.

In general, it is important to understand the extent of competition between fertilizer companies. Other things equal, if these firms are competing vigorously then we expect that they will look to innovate and invest in increasing efficiencies in the value chain, including improving operations at the ports (for example, Yara's investment in a dry bulk terminal at Dar es Salaam could be viewed as such a strategy) and demanding better quality and prices from road freight companies.

In the earlier discussion, we argued that there have been substantial margins accruing to importers and wholesalers along the fertilizer value chain, which may be due to anti-competitive arrangements. This situation can be exacerbated if there are vertical agreements between fertilizer traders and trucking companies. This implies that fertilizer traders have a role to play in influencing outcomes in the road freight sector in each country.

As it stands, across most fertilizer importers we find that road transportation services are outsourced to freight companies except in specific cases such as ETG which is vertically integrated with a transportation operation. As we discuss below, this seems to have allowed the company to present a more competitive offering to the market throughout the region.

We profile the major fertilizer companies in each of the countries (Table 9), distinguishing between those with operations in more than one of the countries in the study, state-owned companies, and other major private importers of fertilizer.

Zambia

The Zambian market has historically been dominated by Omnia and Nyiombo, with collective shares estimated around 70-80% in 2009.⁵⁸ ETG and Greenbelt have grown strongly in recent years whilst Nyiombo has lost a substantial share. According to one of the major fertilizer companies estimated shares for commercial sales only (not subsidized sales) in 2013/14 are: Omnia 30%; Greenbelt 30%; ETG 10%; Nyiombo 7%; Zambian Fertilizers 6%; and others 17%.⁵⁹ ETG, however, places its share higher than 10% as one of the market leaders, including supplies under the subsidy programme. There has also been an increase in smaller firms, including those set up by ex-employees of fertilizer companies. This may also be linked to the end of the cartel arrangements which saw Omnia and Nyiombo dominate the market in Zambia for several years, as discussed below.

Malawi

It has been more difficult to obtain estimates of market shares in Malawi although Yara, Omnia, Farmers World and ETG each have operations in this market although notably without significant blending or production facilities. The most prominent fertilizer importer in Malawi is Farmers World Group, a subsidiary of Meridian International which is headquartered in Mauritius and has operations in Malawi, Mozambique and South Africa. Meridian International also has a freight forwarding company in its group, Transcargo, which has port operations in Beira and Nacala. Farmers World is a group of companies which comprises fertilizer, grain and seed companies. Within this group, Farmers World Ltd, Agora Ltd and Malawi Fertilizer Company are involved with fertilizer trading. Farmers World and Agora import inorganic

⁵⁸ 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.

⁵⁹ It is not clear how these shares can be estimated so closely unless the Fertilizer association is collecting sales data from market participants.

fertilizers while Malawi Fertilizer Company (MFC) blends and supplies NPK compounds for both domestic and export purposes. Farmers World Ltd and Agora both have distribution outlets in the North, South and Central regions of Malawi. All three companies supply fertilizers to the subsidy programme, discussed below. Collectively they contributed just over 20% of fertilizers for the subsidy programme in the 2013/14 season (Logistics Unit, 2014: 23). Similarly to ETG, Farmers World not only supplies inputs but also provides a platform for farmers to sell produce such as maize, soya beans and groundnuts.⁶⁰

Tanzania

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

Regional suppliers

We find that the largest fertilizer companies in the region are also those firms with a wide network of capabilities including offices, multiple depots, large storage facilities, and that provide some financial and logistics services. In this context, ETG's growth in the regional market is particularly significant considering the capabilities of large global firms such as Omnia and Yara. The firm has made significant entry into several markets around the continent, including Rwanda, Malawi and Tanzania. In Zambia, ETG stated that in the space of three years they have grown to become one of top three fertilizer companies, alongside Nyiombo and Omnia. This may be due, in part, to ETG's business model as well as the cessation of cartel arrangements in fertilizer trading in the region. In Tanzania, the company has managed to accumulate a market share of between 20-40% (despite the fact that they do not currently blend fertilizers in Tanzania⁶¹) since their entry in 2006 which is significant.

ETG advised that they prefer to use their own fleet to transport fertilizer and other inputs to farmers and as such are able to minimize the margins they would otherwise pay on transportation. Although they do also sell through retailers, they stated that their model has allowed them to compete more vigorously with the incumbent firms by charging low margins on transport (for example) to the benefit of farmers. They in turn have arrangements with the farmers to buy their in-season produce and sell it into the domestic and export markets, which is where they are able to recoup lost margins. In terms of transport costs, this provides opportunities for ETG to obtain return loads - for example, STACO stated that for a period of up to 120 days from December there are significant return loads of maize from the major agricultural regions.

In Tanzania, ETG states that they sell mostly along the northern corridor towards Lusaka (e.g. to Mbeya) and although firms such as Yara entered the market some time before them, the nature of their business model allows them to charge minimal margins which makes their

⁶⁰ Farmers World Group corporate profile.

⁶¹ ETG is planning to erect a blending plant in Dar es Salaam to supply countries along the central corridor being Tanzania, Rwanda, Kenya, DRC, Uganda, Malawi and Burundi, however most areas in Tanzania, Malawi and Mozambique are still being covered by their plant in Mozambique. ETG does have two facilities in Tanzania at Bagala and Tanita. They plan to grow the facility at Bagala to 190000 tons.

fertilizer price \$3-4 or 7-10% below the price that Yara charges for a 50kg bag. According to ETG, Yara does still benefit from having an established reputation and brand power. STACO argued that Yara also benefits from selling a significant amount of fertilizer on credit while firms like ETG have also benefited from government incentives such as through the Tanzania Investment Corporation (TIC).

The growth of ETG in the region has coincided with the decline in the shares of major firms such as Omnia and Yara. In Zambia, ETG has been able to grow significantly following the end of the cartel which lasted from 2007-2012. We discuss this finding by the Zambian Competition and Consumer Protection Commission below.

Table 9: Major fertilizer companies in Malawi, Tanzania and Zambia

Source: Interview data and company websites

	Fertilizer company	Ownership	Vertically integrated with freight operation?	Operations across study countries	Estimated market share	Profile
Major multinational fertilizer companies	Export Trading Group (ETG)	Private	Yes – PHL Africa; ETG largely distributes using their own fleet	Tanzania (since 2006)	Between 20-40%	<ul style="list-style-type: none"> ETG started in 1967 in Kenya and operates in agriculture Currently has operations in 30 African countries Has a logistics arm – PHL Africa – which transports fertilizer and agricultural produce Has registered rapid growth in the past 3 years in Tanzania, Zambia, Malawi and Rwanda (70-80% share) Bulk blending plant in Zambia; building plants in Beira
				Zambia	10%+ (ETG claim to be market leader in 2013/4)	
				Malawi	ETG claim to have grown significantly	
	Yara	Part of Yara International group based in Norway	No – transport outsourced	Tanzania	40%	<ul style="list-style-type: none"> One of the largest global fertilizer and agricultural inputs firms One of the largest suppliers of the fertilizer subsidy programme in Tanzania Only supplies limited quantities to Zambia Agricultural Resources Ltd (ARL) is sole distributor of their products in Malawi (also sells other brands)
				Malawi	Small presence	
	Omnia Ltd	Part of Omnia Holdings Ltd group	No – transport outsourced	Zambia	30% (estimated 40% in 2009)	<ul style="list-style-type: none"> One of the largest regional fertilizer and agricultural inputs firms Produces dry, liquid and speciality fertilizers Have regional office in Zambia, Zimbabwe, Angola, and Mozambique, but also service DRC, Botswana, Namibia, Ethiopia and Kenya from their South Africa office. Has facilities in Malawi Strong volume growth in Zambia (Annual Report, 2013) Involved in cartel conduct in Zambia with Nyiombo from 2007 to 2012
				Malawi	Facilities	
	Nyiombo Investmts	Private		Zambia	7% (estimated 34% in 2009)	<ul style="list-style-type: none"> Zambian firm, entered in 2002 Presence in Zambia, Malawi, Tanzania, Zimbabwe; head office Lusaka Claim to sell 200000 tons of fertilizer annually into Central and East Africa Marketing, financial and logistics services Network of rural satellite depots Distribute granulated NPK, Urea, CAN, DAP, D-Compound Have been involved with subsidy programme in Zambia since inception 2004/5
				Malawi	presence	

						<ul style="list-style-type: none"> Involved in cartel conduct in Zambia with Omnia from 2007 to 2012
Govt owned	Tanzania Fertilizer Company	State owned	No – transport outsourced	Tanzania	Small	<ul style="list-style-type: none"> Produced domestically until 1990s
	Nitrogen Chemicals Zambia	State owned	No – transport outsourced	Zambia	Small	<ul style="list-style-type: none"> Apparently in disrepair, operating sub-optimally Conduct blending and production under state subsidy programme
Other significant importers and producers	Shivlal Tank & Company (STACO)	Private	No – transport outsourced through agents	Tanzania	Claim to have 10%	<ul style="list-style-type: none"> Only involved in fertilizer trade
	Premium Agro Chem	-	-	Tanzania	Small	<ul style="list-style-type: none"> Trade mostly in fertilizers Also export to neighbouring countries
	Minjingu Mines and Fertilizer Ltd	Private	-	Tanzania	-	<ul style="list-style-type: none"> Only domestic producers of fertilizer in Tanzania – Minjingu Rock Phosphate
	Greenbelt Fertilizers Ltd	Subsidiary of CHC Commodities (Zambian) firm in logistics, brokerage, storage, financing	No – transport outsourced	Zambia	Claim they hold 30% of overall commercial agriculture sector; (estimated 3% in 2009)	<ul style="list-style-type: none"> Blending and marketing Imports materials and blends in Zambia (since 2004) in Kabwe and Mazabuka (since 2006) Also supply Mozambique, Malawi and Zimbabwe Supplies commercial farmers (100ha) Have commissioned a 2nd plant in the north, and installed plant in Beira in 2011 Claim to hold 80% of fertilizer supply to Zambian sugar industry
	Zambia Fertilizers Ltd	-	No – transport outsourced	Zambia	6% (estimated 12% in 2009)	<ul style="list-style-type: none"> Involved in importing and blending Import through Durban and Beira, and sometimes Dar es Salaam Sold blending facility for specialized fertilizers in Zambia to ETG Source Urea from various sources including Farmers World, Profert South Africa, ETG, Bosveld
	Sasol Fertilizers	Trading as Bridgeway Commodities	-	Zambia	Small (estimated 4% in 2009)	<ul style="list-style-type: none"> Previously bid for supplying subsidy programme Operate as the main distributor of Sasol Nitro products and general dealer in Zambia
	Farmers World Group	Subsidiary of Meridian International Group. Farmers World includes Farmers' World Ltd, Agora Ltd and Malawi Fertilizer Company	Freight forwarder, Transcargo, in its group, port operations in Beira and Nacala	Malawi	-	<ul style="list-style-type: none"> Farmers' World and Agora import inorganic fertilizers Malawi Fertilizer Company blends and supplies NPK compounds for both domestic and export purposes
	Optichem	-	-	Malawi	-	<ul style="list-style-type: none"> The only fertilizer company in Malawi with a granulation plant Also has a blending facility

Overall, the structure of the market at the level of fertilizer traders has an important impact on the outcomes in the road transportation level of the market. For instance, in cases where the fertilizer 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 fertilizer companies outsource road transport services they can play a significant role in stimulating (or chilling) price competition between transport companies.

The arrangements for fertilizer transportation are generally similar whether fertilizer is meant for government subsidy programmes (which we discuss below) or imported by fertilizer companies for sale in the commercial market which operates alongside the subsidized market. Freight forwarding companies advised that fertilizer companies will typically contract directly with a trucking company and not via a freight forwarding company to minimize the costs associated with dealing with an intermediary such as a freight forwarding company. This practice transfers the risk of managing the relationship with the transport company to the importing company. Where freight forwarding companies are involved, the buyer (fertilizer importer) will still stipulate which company they would like to handle the transportation of goods.

Yara's operations are a useful example of how this process works. In the case of the Southern African market (which for them includes Zambia), Yara is only responsible for shipping the ordered volumes of fertilizer (mainly Urea) from Qatar in the Arab Gulf to Durban.⁶² As such they are accountable for the on board shipping costs and the cost of insurance and freight. Once the shipping vessel has reached the port in Durban, it is the responsibility of those customers who have ordered specific quantities of fertilizer to arrange for its offloading, storage and trucking from the port. This is consistent with information obtained from freight forwarding companies at the port in Dar es Salaam. For sales of their own products to customers in the region, they utilise the logistics and distribution capabilities of another distribution firm, Kynoch, which has a contract with the fertilizer importer to be its sole distributor in the region. Specifically, the fertilizer importer will sell volumes of fertilizer to the distributor who then solely distributes the products through their retail networks. This contractual arrangement is typically renewed year-on-year on the basis of the distributor's performance and subsequent negotiations (only the *terms* of the arrangement are likely to be affected from year to year). Importantly, the fertilizer company prefers to maintain their long-standing relationship with the appointed distributor.

This is similar to the case of TFC in Tanzania which found that although they are free to contract with any transportation company and make them compete with one another in order to arrive at a good transport rate, over time they tend to end up using the same transport companies based on prior relationships.

In many ways the nature of this relationship suggests that in the case of fertilizer, customers inadvertently may be important drivers of the 'lack' of competition in road transportation over time by not readily switching between operators and playing them off against each other on the basis of price, efficiency and performance. We discuss the relationship between fertilizer trading and road transporters in the context of each country in sections to follow.

⁶² Interview with Yara.

The fertilizer subsidy programmes

Fertilizer subsidy programmes have contributed significantly to the use of fertilizer by farmers in each of the countries we assess. However, the mechanisms used to implement programmes can also distort competitive outcomes to the detriment of the same farmers and, ultimately, consumers which the programmes seek to support. This can occur through distortions created at the level of fertilizer traders, or in the transport market. For example, the allocation of volumes under the subsidy programme to certain suppliers can give them an advantage in the market (as seems to have happened in Zambia, with cartel conduct now being evident between the two main suppliers to the subsidy programme). In the case of Malawi, the subsidy is set so high it seems to have set a price floor and had the effect of supporting higher overall prices, including for the substantial proportions of fertilizer which are not subsidised.

The Tanzanian subsidy programmes have historically aimed to address the higher transport costs that lead to higher prices in rural areas further from Dar es Salaam. However, over time the amount of the subsidy and the geographic reach have increased to cover effectively the whole country. At the same time, there are questions as to whether it is having the desired effect of increasing fertilizer use.

Malawi

The agricultural sector in Malawi provided 90% of total employment, 90% of exports and contributed approximately 30% to Malawi's GDP respectively (IFDC, 2013b). Tobacco, sugar and tea are the main export commodities with tobacco alone accounting for more than 50% of merchandise exports for the past two decades. Tobacco crop production covers 105 thousand hectares while maize covers 1.3 million hectares of land (Likoya & Mangisoni, 2010). While tobacco is the main agricultural export, maize as a staple food crop is also very important and thus forms an important aspect of Malawi's food security objectives. The dependence of the Malawian economy on agriculture, both for income and for food security, underpins the importance that is placed on its performance. A large part of this performance is dependent on the use of fertilizer.

Unfortunately, agricultural production is not as high as it should be. This is due to a number of factors such as soil depletion and the profitability of certain crops, as well as the low usage of fertilizer. Given the importance placed on its agricultural sector, the Malawian government has agreed (under the auspices of the Malawi Growth & Development Strategy – MGDS II) to raise agricultural growth by 6% and to ensure that its budget allocation to the agricultural sector is at least 10%. In order to meet the 6% growth target by 2016 Malawi would need to increase consumption of fertilizer from 297 000 tons to 600 000 tons annually (IFDC, 2013b: 37). As there is no local production of fertilizer in Malawi, all of its fertilizer requirements are imported. While Malawi has some phosphate rock deposits, these are insufficient for the production of fertilizer. In addition, given the costly process required to convert them into useful fertilizers, these phosphate rock deposits are not of economic value (IFDC, 2013b: 21).

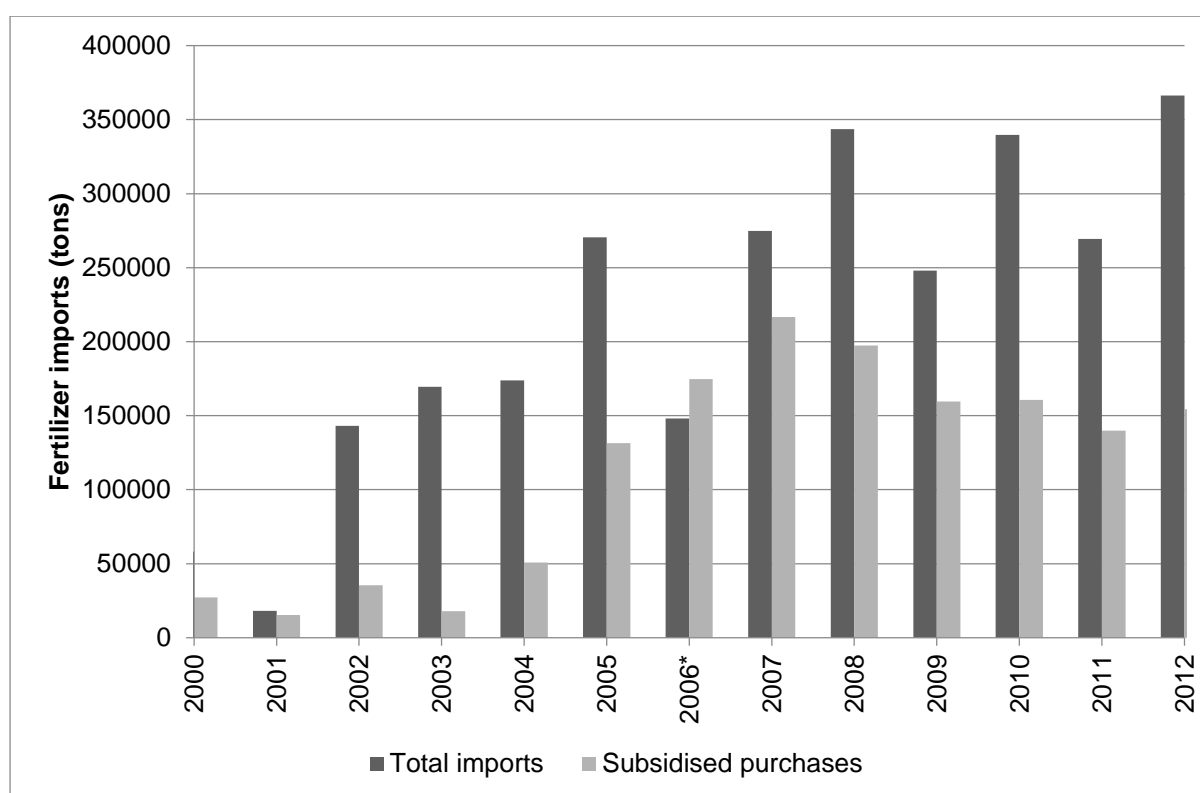
The use of fertilizer by farmers is constrained by profitability and affordability. If the fertilizer is unsubsidised it is too expensive (IFDC, 2013b). This is consistent with our estimates above that Malawi's fertilizer prices are currently \$200/ton above those in both Tanzania and Zambia (table 2).

Over the years, Malawi has implemented numerous subsidy programmes as follows:

- During the mid-1970s to the early 1990s, there was a universal fertilizer subsidy. This subsidised smallholder credit and controlled maize prices (Dorward & Chirwa, 2011: 234).
- From 1998/99 to 1999/2000 there were free starter packs that were issued to all households.
- From 2000/01 to 2004/05 free starter packs were given to smaller targeted households.
- In 2005/06 the government of Malawi implemented a very large-scale input subsidy programme (the Agricultural Input Subsidy Program, AISP, also known as the Farm Input Subsidy Programme, FISP) because of the persistence of food security concerns despite earlier programmes.

The FISP is the latest subsidy programme to be implemented by Malawi. It is facilitated by the Agricultural Development Marketing Corporation (ADMARC) and the Smallholder Farmers Fertilizer Revolving Fund of Malawi (SFFRFM) which are state agencies tasked with distributing fertilizer for this subsidy programme. Imported fertilizer is delivered to SFFRFM regional warehouses. The SFFRFM then has the fertilizer delivered to the ADMARC rural warehouses. Previously the government handled both the importation and the distribution. Now the SFFRFM issues out a competitive tender for the importation of fertilizer and for its transportation to the ADMARC warehouses (IFDC, 2013b). The fertilizer subsidy programme has played a greater role in the consumption of fertilizers in Malawi, especially from 2005 onwards (Figure 16).

Figure 16: Malawi total fertilizer imports versus subsidised purchases, 2000-2012



Source: Malawi National Statistical Office Statistical Yearbook (2012); IFDC (2013b); Chirwa & Dorward (2013)

The FISP is administered in the following manner. The District Agricultural Development Officers (DADOs) from the Ministry of Agriculture and Food Security (MoA & FS) select the farm families who will be beneficiaries of the subsidy programme. The farm families receive fertilizer, maize and legume seed vouchers. Farmers receive two vouchers each, one for 50kgs of Urea and another for 50kgs of NPK. The NPK is 23:21:0+4S or 23:10:5+6S+1.0Zn; suppliers can choose which one to bid for. Farmers redeem the vouchers from the ADMARC/SFFRFM unit markets and farmers 'top up' with a payment of MK500 per bag (about \$1.30) of fertilizer for both the Urea and the NPK. In 2012/13 the vouchers included security features to prevent the production and distribution of fake vouchers. In 2013/14, e-vouchers were introduced as a pilot programme in certain regions, albeit for seed only (Logistics Unit 2013, 2014).

In 2012/13 to 2013/14 the target for FISP has been around 150 000 tons (Table 10). The farmers' contributions to the purchase of subsidised fertilizer have, however, decreased dramatically since the inception of the current programme in 2005/6. This is the amount that farmers need to pay to top-up, reflecting the difference between the price and the value of the voucher (Chirwa & Dorward, 2014). In 2005/6, the MK950 that farmers paid represented roughly 37% of the price of a bag of fertilizer and this has dropped to approximately 3% in the 2012/13 season. Given that Malawi prices are some 20-25% above our benchmarks for competitive prices, this means that the voucher value is substantially more than a competitively priced bag of fertilizer. This implies that the high value of the voucher may act as a price floor below which fertilizer is not sold, whether to farmers with vouchers or for commercial (non-subsidised) sales. Even if there was increased competition in fertilizer trading or improvements in the cost of road transportation, the potential pro-competitive effects in the market would be muted by the price floor.

Table 10: FISP key observations, 2012/13 - 2013/14

	2012/13	2013/14
Total fertilizer (tons)	154 455	149 971
Cost (US\$)	129 022 749	111 346 680
NPK/Urea breakdown (tons)	77 240 (NPK) 77 215 (Urea)	74 991 (NPK) 74 979 (Urea)
Unaccounted	3.2%	0.53%

Source: AISP Implementation Reports, 2012/13, 2013/14

While both government and business agree on the need for the subsidy, businesses feel that the government does not manage and implement the FISP well. Only 47% of potential needs for increased crop production are being met by the current fertilizer consumption (IFDC, 2013b: 19). Some of the other challenges encountered were as follows (Logistics Unit, 2013):

- in 2012/13 there was a lack of transparency in the allocations of beneficiaries at the district level;

- there was a change in the number of beneficiaries selected from 1 500 000 to 1 544 400 midway through the program which would have had both financial and logistical ramifications; and
- there was slow distribution of paper vouchers such that while deliveries of subsidised fertilizer began in early October 2012, some vouchers were reportedly only delivered in January 2013.

In terms of transporters, there was reportedly a lax tender process for the acquisition of transport services. Moreover, there was theft of fertilizers which is captured in the 3.2% of unaccounted fertilizers (Logistics Unit, 2013). Finally, in 2012/13 the number of transporters commissioned to transport fertilizers for the FISP increased from between 23 and 26 transporters from 2008 to 2011 to 43. There is no clear explanation for why this happened, especially since the volume of fertilizers required for the FISP did not increase dramatically from 2011/12 (approximately 140 000 tons) to 2012/13. While police were brought in the following year to participate in the evaluation process, this helped only a little in alleviating the theft purportedly committed by the transporters. This time, the number of transporters appointed went back down to 22. In spite of these measures, some of the transporters did not have enough vehicles while others were so un-roadworthy that they had to be used with no speedometers or odometers. Companies are likely to submit very competitive bids in terms of low transport rates however this may be at the expense of quality (see also Ward & Barreto, 2011). By regulating the number of truck companies the programme distorts the process of competitive rivalry between these operators wherein less efficient and unreliable operators would be marginalised or forced out of the market.

The effect of the price floor in fertilizer trading also means that there is no incentive for traders and transporters to innovate, improve quality of service, and invest in strategies to reduce their costs and thus pricing below this level. This has the effect of dampening competition in both of these levels of the market. In this way, dynamics in the subsidy programme affect outcomes in fertilizer trading and road freight.

Tanzania

Fertilizer usage is very low in Tanzania with only 9% of farmers in Tanzania reported to be regularly using fertilizers in 2008 (Benson et al, 2012: 1). This has been attributed to a number of factors including the cost of fertilizers, lack of sufficient knowledge about its proper use, and insufficient credit markets. There has been a lot of emphasis on the fertilizer subsidy, as the government has made sustained efforts to increase the usage of fertilizer particularly in rural areas and those where there is poor road infrastructure which can sometimes be neglected by private importers.⁶³ The government has historically viewed agriculture as the backbone of the economy and saw the increased usage of agricultural inputs as critical to increasing output and ensuring security in food supply.

In order to achieve this the government also concentrated its efforts on supplying fertilizer to the major agricultural districts such as Mbeya, Iringa, Ruvuma and Rukwa which together consume over 50% of fertilizer in Tanzania.⁶⁴ The Ministry of Agriculture stated that for the subsidy programme 60% of fertilizer is distributed to the 8 major agricultural areas out of 25 regions.

⁶³ According to the TFC.

⁶⁴ Interview with TFC.

There have been a number of fertilizer subsidy programmes in Tanzania dating back to the 1970s which we describe briefly, as follows:

- In the 1970s, the subsidy programme funded the difference between factory costs of locally-produced fertilizer and its selling price.
- In the 1980s, the subsidy covered the full cost of transport from the warehouse to the wholesaler/retailer.
- In 2003, the subsidy was provided to wholesalers to cover the transport costs to remote areas and a portion of the final price. This policy which stretched from 2003 to 2007 was intended to ensure that the price of fertilizer was the same throughout the country although this also resulted in significant leakages of fertilizer to other countries.⁶⁵ This programme was based on an allocation system, whereby fertilizer companies were told that they should deliver fertilizer to certain areas and at certain volumes, including price enforcement mechanisms to ensure reduced fertilizer prices for farmers (Benson et al, 2012: 8). In that system, the government would ask the traders how much fertilizer they had in order to place orders and include the firm in the scheme, which created incentives for the companies to overstate their volumes (capacity) in order to win contracts from the government.⁶⁶
- The current subsidy programme is known as the National Agriculture Input Voucher Scheme (NAIVS) and was launched in 2008. This programme benefited from World Bank support from 2009 to 2012 which increased the number of vouchers and beneficiaries and allowed the programme to be stretched to cover the whole country (except Dar es Salaam) with the same budgetary input from government.⁶⁷

The Tanzania subsidy schemes have generally been focused on subsidizing the cost of transport of fertilizer to reduce the delivered price of fertilizer across the country. As with Malawi, the scheme has expanded substantially over recent years. In the case of Tanzania, the coverage has been widened to the whole country. Unlike the previous subsidy scheme, the NAIVS is targeted directly at subsidizing farmers (only those with one acre farms) rather than transportation or specific retailers. Farmers receive vouchers for two bags of fertilizer - one for planting and one for top dressing, with the value of the voucher having been around 50% of the price of an input pack from any agro-dealer. The level of the subsidy (value of the voucher) varies across the country such that in Mbeya the planting voucher carries a value of TSh50 000 and top dressing TSh40 000 (about \$26-27), while in Iringa and Mtwara (somewhat closer to Dar es Salaam) the value of the voucher is TSh40 000 and TSh30 000, respectively. For planting, two types of fertilizer are authorized, namely Minjingu Mazao and DAP, although currently the government recommends two bags of Minjingu Mazao at TSh65 000 instead of one bag of DAP because Minjingu Mazao is locally produced. This apparently caused a reduction in the imports of CAN to Tanzania in recent years because it was not recommended by the government⁶⁸, which in itself distorts competitive market dynamics by affecting demand in the market. For top dressing the government authorizes Urea.

⁶⁵ Interview with Ministry of Agriculture in Tanzania.

⁶⁶ Interview with TFC.

⁶⁷ Interview with Ministry of Agriculture in Tanzania.

⁶⁸ Interview with TFC.

There is no tender process for fertilizer companies that want to supply under the voucher system. Instead government will issue a circular listing all of the firms that have applied (through the TFRA) and that will be allowed to participate in the programme for that year. All firms can apply to be a supplier and the TFRA issues the rights to participate on the basis of factors such as the ability to supply the products. These major companies typically have agro-dealers and agents distributed throughout the country. Through these agents, the current system requires fertilizer companies to go to the district office (one of 109 districts) in the local area in which they want to participate and apply for approval to supply fertilizer to the subsidy programme in that region. The district office can refuse access to a particular supplier if, for instance, that supplier did not perform well in terms of reliability in the previous season. This places a significant level of power in the hands of the leadership of each district particularly in significant farming areas.

Once the agro-dealers and agents are identified government will disperse vouchers to regions and districts through local officials to the farmers themselves. The agents and agro-dealers will then compete for farmers to come to purchase fertilizer using the vouchers. The vouchers are then redeemed by the sellers through the banks, who forward them to government for payment. The redemption payment is either made directly to the agents or to the main fertilizer company which then pays the agent depending on the contractual arrangement. The nature of the system is such that it is not possible to redeem a voucher which is designated for one district in another district. Thus, for instance, a farmer cannot go and purchase fertilizer in another region where it may be cheaper.

The volume of fertilizer covered by the subsidy scheme ranged between 140 000 tons and 201 000 tons from 2009 to 2014 (Table 11). This appears to be a very substantial proportion of the fertilizer used (around 40%), given that import data from the Tanzania Revenue Authority (TRA) which shows that in 2013 imports of Urea for local use (after allowing for re-exports) were just 138 522 tons and total fertilizer imports (including re-exports) were close to 400 000 tons. However, the government claims that subsidized fertilizer is a relatively small proportion of total fertilizer used, at around 10-15% of the total market.⁶⁹ This would put the total market at a much larger size than recorded in the import data (and taking into account Minjingu's local production). Alternatively, if the 10-15% estimate is correct, then the tons of fertilizer actually being purchased with vouchers would be much smaller (at around 60 000 tons).

Table 11: Total fertilizer volumes under government subsidy in Tanzania

Year	Volume (tons) of fertilizer
2009/10	150 000
2010/11	201 000
2011/12	178 000
2012/13	126 000
2013/14	140 000

Source: Ministry of Agriculture, Tanzania

Overall, our understanding is that the government is considering shifting away from the subsidy scheme and instead educating farmers on how to apply for loans as groups instead

⁶⁹ Interview with Ministry of Agriculture in Tanzania.

of getting unsustainable support from the government.⁷⁰ More importantly, farmers are now aware of the benefits of fertilizer use and will pay if they can access the finance.

Understanding these arrangements is significant in so far as the subsidy affects the price of fertilizer in the market. We would expect that the pricing in local areas in Tanzania would reflect competition between fertilizer companies to expand their agency networks in order to distribute fertilizer to more districts. This is in contrast to the Zambian case where cartel arrangements (market allocation), market power vested in powerful buyers (fertilizer companies) and corruption in the tender process at this level of the market have seemingly had the ability to distort competition in both the fertilizer and road transportation market. Other things equal, if the subsidy programme in Tanzania makes it possible for a wide range of companies to supply each district⁷¹ then there would be a higher level of competition amongst these companies reflected in more competitive prices including outside of the subsidy programme. This positive outcome should also be enhanced by the growth of aggressive competitors such as ETG. Finally, in terms of competition in road transportation, there is a direct link with outcomes in the fertilizer supply market arising from the fact that when fertilizer can be distributed to a wide range of different regions and there are a number of companies vying to supply to major regions, demand for transport is stimulated.

Zambia

Zambia has adopted a range of reforms utilizing the Comprehensive Africa Agricultural Development Program (CAADP) and other frameworks to increase agricultural productivity – fertilizer (commercial and subsidized) plays an important role within this programme. At the centre of these strategies is increasing the adoption and intensified use of new technologies that enhance yields – one such avenue is through increased fertilizer subsidies. IFDC (2013a) shows that to meet the agricultural growth targets under the CAADP, fertilizer consumption in Zambia would need to increase by 248 000 tons to 500 000 tons. It is therefore important to increase efficiencies at every node of the value chain including the transportation of fertilizer in order to deal with the anticipated increase in consumption (IFDC, 2013a). However, outcomes in terms of the subsidy programme have been distorted by cartel conduct at the level of fertilizer trading. This section describes the subsidy programme in Zambia and section 5 will draw the links with competition in road freight and fertilizer trading in the case of Zambia.

Some of the constraints which limit the increased usage of fertilizer in Zambia include: public policies that impede private investment; poor port, rail and road infrastructure; financial constraints and storage limitations for inputs and outputs; and inadequate capacity at the farm and agro-dealer level (IFDC, 2013a). The Zambian government plans to grow the contribution of agriculture to GDP to over 30% by 2015 and as part of that process they use 60% of the agricultural budget on two programmes, that is, two primary state-led mechanisms for facilitating the growth in fertilizer uptake (IFDC, 2013a):

- a. Food Reserve Agency (FRA) – FRA purchases maize ‘at pan-territorial prices that are fixed above prevailing market prices’. This programme purchased between 36% and 86% of all marketed maize in Zambia between 2004 and 2010. By selling this maize to millers at subsidized prices the expectation is that millers will, in turn, sell maize

⁷⁰ Interview with Ministry of Agriculture in Tanzania.

⁷¹ For this study, it was not possible to obtain the full list of fertilizer companies operating or being represented in each district.

products to consumers at favourable prices and thus cushion consumers from high prices. Unfortunately it seems this programme largely benefited large farmers with surplus maize sales.

- b. Fertilizer/Farmer Input Support Programme (FISP) – this programme distributes subsidized fertilizer. By focusing solely on maize the FISP has encouraged an increase in the area under maize at the expense of other crops. Large farmers with significant land resources have benefited more than small farmers (IFDC, 2013a).

The FISP primarily distributes D-Compound and Urea and accounted for approximately 43% of total fertilizer distributed in Zambia (at 48 520 tons) in 2007/8, and 200 000 tons in 2013 which has apparently crowded out the private sector importers (IFDC, 2013a). The tender process to participate in this programme works in the following way:

- The FISP Implementation Agency decides on the amount of the subsidy and asks for tenders from importers. Bids are then selected based on criteria including prices. Firms are also required to have some volumes of fertilizer available in inventory during the tender period which has implications for storage costs. This stage of the process takes place between March and August.
- It will take importers three months to transport the product to Zambia (September-November).
- Finally, it will take four to six weeks to distribute fertilizer around the country.

At the local level, the subsidy recipient pays for the discounted fertilizer price at the bank, gets a deposit slip, and then goes to a local Ministry of Agriculture and Cooperatives (MACO) office to receive a letter allowing them to collect fertilizer from the nearest importer warehouse or store.

Historically, Nyiombo and Omnia have dominated the fertilizer programme although it appears that they have done so due to tender bidding requirements that favoured incumbents and inhibited an open and competitive process. On their website Nyiombo indicate that they win the FISP tender due to capacity to deliver and a proven track record earned from having been involved with the FISP since its inception in 2004/5.⁷² However, the CCPC of Zambia found collusion between Omnia and Nyiombo in the FISP tender. Omnia and Nyiombo have in recent years also been linked to allegations of fraudulent relations with the government agents that are in charge of facilitating the tender process in the Zambian Public Procurement Authority and Ministry of Agriculture.⁷³ The Permanent Secretary of Agriculture had to intervene in the tender process for the 2012/13 period to change clauses of the tender bidding requirements.⁷⁴

Specifically, the bidding documents previously stipulated the following criteria:

⁷² Nyiombo Investments website: <http://www.nyiombo.co.zm/>

⁷³ See, for example, 'Government broadens FISP tender process' (18 April 2012), at: http://www.postzambia.com/post-read_article.php?articleId=26958; and 'Corruption deal backfires' (18 December 2013), at: <http://zambiadailynation.com/2013/12/18/corruption-deal-backfires/>; and 'PAC questions govt over Nyiombo Investments, Omnia's contracts' (25 March 2010), at: http://www.postzambia.com/Joomla/post-read_article.php?articleId=7395.

⁷⁴ See 'Government broadens FISP tender process' (18 April 2012), at: http://www.postzambia.com/post-read_article.php?articleId=26958

- Fertilizer suppliers/importers should have a credible track record and demonstrate their capacity (including financial) to deliver on the order;
- Under financial capacity, bidders should show proof of having available financial resources or lines of credit from reputable commercial banks equivalent to the monetary value of the fertilizer quantities in the zones bid for;
- Bidders should own or rent warehouses sufficient for the quantities bid for, or show proof that they have made arrangements for storage at designated central points;
- Bidders should provide evidence of having supplied fertilizer including quantities provided and proof of contracts previously awarded.⁷⁵

On this basis, and according to the sources used by the *Post Zambia*, Omnia and Nyiombo have dominated supplies to the FISP, although we understand that some of the other firms, including *Zambian Fertilizers* and *Greenbelt*, have sometimes also supplied the FISP over the years since its inception.⁷⁶ Omnia and Nyiombo were also found by the CCPC with regard to the FISP tender to have colluded on prices and divided geographic markets. In the commercial market we note the CCPC findings in 2009 that market shares for Omnia and Nyiombo were 40% and 34%, respectively, based on user surveys.

The FISP fertilizer subsidy programme has a significant effect on the market for the transportation and distribution of fertilizer in Zambia overall in so far as it drives a significant proportion of fertilizer demand. In this regard, opening up the tender and identifying and sanctioning collusion in the tender process, has reinforced the moves to open up road transportation. The change in relative prices in Zambia and the fact that the market shares of the two largest firms have been eroded in recent years suggests that there has been more meaningful competitive rivalry in the market from firms such as ETG and more competitive outcomes.

Interestingly, access to the FISP tender seems to be critical for farmers – where government does not meet import quantities or when there are delays in delivery, farmers still prefer to wait for the subsidised fertilizer to arrive before purchasing from the commercial market at higher prices (IFDC, 2013a). Transport to the farms is provided by government through transporters who are hired through a bidding process (IFDC, 2013a: 25).

As noted above, local fertilizer production is low and limited to the state-run Nitrogen Chemicals Zambia (NCZ) plant which is in disrepair. Our understanding is that NCZ is actually functional, but it is not economical although for the 2013/14 season government in Zambia chose to award NCZ a compounding tender to produce just less than 100 000 tons of fertilizer (D-Compound and Urea).⁷⁷ Other fertilizer companies were contracted to supply inputs to NCZ's production. The late President Sata of Zambia announced in January 2014 that NCZ had achieved this target, which suggests that there is some capacity for domestic production in Zambia (noting that this is for blending of fertilizer, which is imported).⁷⁸

⁷⁵ See 'Government broadens FISP tender process' (18 April 2012), at: http://www.postzambia.com/post-read_article.php?articleId=26958

⁷⁶ 'Corruption deal backfires' (18 December 2013), at: <http://zambiadailynation.com/2013/12/18/corruption-deal-backfires/>. Losing bidders will sell under competitive commercial market conditions parallel to the subsidy programme.

⁷⁷ Interview with Greenbelt Fertilizers.

⁷⁸ See 'Over 96000 metric tonnes of fertilizer distributed countrywide by Nitrogen Chemicals Zambia' (23 January 2014), at: <http://breezefmchipata.com/?p=3677>

4 Analysis of the state of competition in road freight and fertilizer trading in Tanzania

This section assesses whether the road freight rates charged by trucking companies in Tanzania are relatively high compared to Zambia and Malawi, and the factors which explain this. As discussed above, the prices of fertilizer in Tanzania and Zambia have converged in recent years despite the additional transport distance to Zambia. Other things equal, this means that margins in transport and trading are high in Tanzania, or they are particularly low in Zambia. Controlling for the additional cost associated with the additional distance and border crossings, assuming the transport rates in the countries are similar then it is likely that the convergence in fertilizer prices is better explained by factors other than transport prices, such as competitive dynamics in fertilizer trading.

Competition in fertilizer trading

As mentioned above, the bulk of the fertilizer used in Tanzania is imported from Europe and the Middle East, through the Dar es Salaam port. Tanzania does produce its own phosphate fertilizer at Minjingu Mines in Arusha – Minjingu Rock Phosphate. However, phosphate is a relatively small proportion of required plant nutrient and the agronomic response is relatively slow – crops only respond in the following season – meaning that this only accounts for a small proportion of demand (Benson et al, 2012: 8). Production at Minjingu Mines is at 20% of capacity because of the low demand. Consequently, the company has begun to blend the phosphate with Urea which has led to a faster response and has increased demand.

The government, through the TFC, previously had a monopoly on fertilizer importation and used to produce certain fertilizers domestically (Ammonium Phosphate and Tri-superphosphate) although these operations were virtually closed down in the early 1990s (Cagley & Plotnick, 2009; interview with TFC). In 1992 there was a substantial shift in government policy leading to the liberalisation of the sector and the entry of about 6 to 10 fertilizer firms that have apparently been in the market since this period, with about 10 of these being larger firms currently. TFC is government-owned but competes in the market against the private commercial operators using a network of warehouses situated in different regions including the major agricultural regions where they sell mostly to retailers. It is generally not feasible for them to have outlets throughout the country and more efficient to allow retailers that deal in products from many different fertilizer companies, to sell for them directly to farmers.⁷⁹ As a state-owned firm, TFC have at times found it difficult to compete because of limited working capital and because they do not have the financial wherewithal of their competitors.

In terms of the overall market, a few large firms dominate fertilizer supply in Tanzania, led by Yara and more recently ETG. However, there are a few smaller competitors in the market as well. High levels of concentration have gone along with high prices and margins in fertilizer trading after accounting for transport costs. As discussed above, the most interesting feature of this market has been the recent growth of ETG which is associated with changes meaning the market has become more contestable such as greater effective access to the port and to bagging facilities. This increased level of competition is likely to have further pro-competitive

⁷⁹ Interview with TFC.

effects in the local market as ETG grows its capacity to import and blend fertilizers for domestic and regional supply. It also appears to be having an effect on prices which are undercutting the prevailing levels.

Yara could also benefit significantly going forward from leveraging their terminal at the port coupled with investments in facilities, to increase efficiencies in their value chain. However, as discussed, the accumulation of high margins at the wholesale and retail level means that measures to address the relatively high fertilizer price in Tanzania will not only need to look at road transportation, but other levels of the market as well. This includes the subsidy programme and addressing the significant level of control vested in district leaders to distribute fertilizer. On the face of it, this situation seems to create opportunities for rent-seeking which are typically higher in smaller (and local) markets. Another view is that the power vested in the districts to decide which firms can sell in their local market creates opportunities for corrupt practices to emerge. These practices could then affect prices in the commercial market, which operates out of the same agro-dealer and retailer outlets.

In addition, there is the risk that the larger fertilizer companies that are part of the subsidy programme have larger resources to ensure that they have agents in almost all districts. This may mean that although there a high number of agro-dealers and retailers in the country, in some remote locations, there may only be the large companies present.⁸⁰ This is exacerbated by the fact that many agro-dealers are possibly reliant on the major companies for fertilizer supplies as well.

The fact that most of the fertilizer companies are participants in the Fertilizer Society, which is apparently designed to deal with issues that affect the whole industry increases the risk that there is some coordination especially in smaller, remote locations. For instance, because the value of the subsidy voucher is significant and farmers generally rely on it, it can influence prices in the commercial market such that fertilizer firms compete on quantities sold and not price. Specifically, by allocating certain locations to one another, these firms could ensure that they each still benefit from selling high volumes even if this is at a lower price. The experience of Zambia in terms of cartel conduct, which we discuss below, is illustrative in this regard.

This discussion draws further attention to the role of the Fertilizer Society. Our understanding is that the society will meet to discuss issues of broad industry interest, such as the position to present to government on directives such as new fees which affect the industry.⁸¹ In this regard, it was still argued that currently there are high levels of competition between these companies although relationships are such that at times firms such as TFC are able to approach competitors to supply them with stock when they are experiencing a shortage.⁸² The representative of TFC is currently the Chairperson of the society and advised that the members tend to be very discrete and do not share information on their business activities or coordinate on industry strategy. Although we do not discuss the role of the Fertilizer Society further, we note the similarity in its structure and title to the arrangements which operated in South Africa during the fertilizer producers' cartel.⁸³

⁸⁰ Although this information is available, the Ministry of Agriculture was not able to provide the records of which firms and agro-dealers operate in each district.

⁸¹ Interviews with STACO and TFC.

⁸² Interview with TFC.

⁸³ See for example, Competition Commission News (June 2009), at: <http://www.compcom.co.za/assets/Uploads/AttachedFiles/MyDocuments/June-09-Newsletter-32.pdf>

Competition in domestic and cross-border transportation

This section considers the transport rates in Tanzania and draws linkages with the discussion regarding relatively high fertilizer prices, competition in fertilizer trading particularly in terms of the growth of ETG.

Average local transport rates from Dar es Salaam reflect the fact that longer distances have slightly lower transport rates due to economies of distance. In 2011 the costs were around US\$0.08-0.12 for routes of 500km and above (Table 12). These rates are similar to the current transport rates for four popular cross-border routes whereby in 2008 transport rates for all but one of the routes were \$0.10 per ton per kilometre (Table 14). It is important to note that only the rates for Mbeya and Arusha were quoted for trucks that are of at least 28-ton capacity. These are trucks used on major routes, including transit to neighbouring countries. The majority of trucks (approximately 77%) that were licensed for commercial trade in Tanzania have a carrying capacity of between 3 and 15 tons (SUMATRA, 2011: 3).

Table 12: Local transport rates in Tanzania (different destinations), 2011

	Distance (km)	\$ per ton	\$ per ton per km
Dar to Mbeya*	828	65	0.08
Dar to Songea	928	100	0.11
Dar to Mtwara	560	69	0.12
Dar to Morogoro	194	43	0.22
Dar to Mwanza	848	81	0.10
Dar to Dodoma	501	44	0.09
Dar to Arusha*	644	63	0.10

Source: SUMATRA (2011). *These are the rates that were quoted for trucks of at least 28-ton capacity.

There is evidence of significant changes in 2014 in the domestic rates due to increased competition. For the major routes from Dar es Salaam to Mbeya and Songea prices have fallen by almost 40% (Table 13). This is because many of the new entrants to the market are owner-driver companies that will typically charge very low rates whereas in the past there was a shortage of trucks in the market.⁸⁴ The Tanzania Truck Owners' Association (TATO) confirmed that the market in Tanzania had become more competitive over this period, attributing this to the significant decline in rail transport, whereby it stopped operating in 2010, resulting in an influx of trucks from that year, particularly of owner-driver operators.

Table 13: Domestic transport rates in Tanzania, 2014

	Distance	TSh/ton	\$/ton	\$ per ton per km
Dar to Mbeya	828	70000	42.7	0.05
Dar to Songea	928	100000	61	0.07
Dar to Rukwa	1187	120000	73.2	0.06

Source: Interview data

Cross-border rates declined slightly from 2008 to 2013, and are similar to the domestic Tanzania rates in 2011, regardless of distance (Table 14). We expect that cross-border routes

⁸⁴ Interview with Transmams Tanzania.

would attract higher rates in some cases due to the delays and costs associated with border procedures. The Nakonde border was also considered to be less efficient than other borders, such as Chirundu and trucking companies would be expected to factor in the opportunity costs of delays into their rates. This further suggests that the local rates have been high given that there are no costs associated with border crossings. One possible explanation for this is that routes to certain rural areas within Tanzania do not attract reliable return loads for trucking companies, whereas routes to Zambia (and DRC) do (largely from the copper regions).⁸⁵ Mbeya, on the other hand, is a strong agricultural region and as such it is likely that trucking companies can benefit from being able to come back with return loads of in-season crops, which might explain the relatively lower rate for this route. However, the reductions in rates in 2014 indicate that more competitive outcomes have been possible.

Table 14: Selected cross border rates, 2008 and 2013

	Distance (km)	\$ per ton		\$ per ton per km	
		2008	2013	2008	2013
Dar to Bujumbura	1 560	160	142	0.10	0.09
Dar to Kigali	1 475	147	135	0.10	0.09
Dar to Lubumbashi	2 038	200	140	0.10	0.07
Dar to Lusaka	1 951	147	138	0.08	0.07

Source: Ernst & Young; TATO A

ETG has their own fleet and noted that they try to minimise any margins which they earn on transporting their products to Mbeya, and will typically only factor in a cost of about \$60/ton from Dar es Salaam to Mbeya (\$0.07 per ton per km). The business model of the company is such that they are able to secure return loads from areas such as Mbeya by entering into partnerships with farmers to deliver fertilizer to them, and then buy their in-season crops and transport these back to Dar es Salaam. This provides a useful benchmark for comparing the prevailing rates provided above for domestic transportation in Tanzania, and indicates a decline in prices of 8% from 2011. For a similar distance to Mwanza⁸⁶, the reduction in transport prices was as high as 26%. This perhaps serves to demonstrate the difference that travelling to an area with significant return loads can make.

Further to this, a Tanzania-registered truck is not charged toll fees in Tanzania, however they would have to pay road tolls in Zambia.⁸⁷ This is consistent with interviews conducted in Zambia and suggests that cross-border rates are likely to account for this additional cost, whereas domestic operators do not have to. This further suggests that domestic rates should have been lower in Tanzania, holding other factors constant.

⁸⁵ Interview with SUMATRA.

⁸⁶ Mwanza region mainly produces cotton, although cotton production has declined in recent decades due to low profitability, inefficient marketing arrangements, and droughts. See 'Socio-economic profile of Mwanza region', at: http://www.mwanza.go.tz/kurasa/habari_mpya/SOCIO%20ECONOMIC%20PROFILE%20OF%20MWANZA%20REGION.pdf

⁸⁷ Interview with Transmams Tanzania.

Costs of road freight

Transport rates have been shown to be relatively expensive within Tanzania, especially over shorter distances. It is therefore important to understand the factors that affect the operators' costs.

The first category of costs are the operating costs which relate to fuel, tyres and maintenance, for example. Table 15 below illustrates this for two round trips from Dar es Salaam to Lusaka and Lubumbashi, respectively. While these figures are from 2008, evidence from interviews suggests that there have not been many changes as far as the general cost structure is concerned. However, some of these costs have increased, and some more than others. For example, fuel used on one trip from Dar es Salaam to Lusaka is 1600 litres.⁸⁸ This translates to fuel usage of approximately TSh3 420 000. The equivalent of the mileage allowance in the table below was estimated at TSh500 000 while the border fees were roughly TSh600 000.

Table 15: Direct operating expenses for a trip to Lusaka and Lubumbashi

	DSM – Lusaka (TSh)	DSM – Lubumbashi (TSh)
Diesel	3 420 000	3 780 000
Mileage allowance	400 000	550 000
Border fees	400 000	1 320 000
Tyres	704 000	756 800
Repairs and maintenance	600 000	645 000
Total direct expenses per trip	5 524 000	7 051 800

Source: TATO

The first thing to note is that a round trip to the DRC is more costly than a round trip to Zambia. The highest difference is due to the border fees where these are much higher when crossing into the DRC than when crossing into Zambia. The mileage allowances are also very different for a trip to Lubumbashi and a similar trip to Lusaka. This is likely because of the amount of time it takes to complete a round trip to Lubumbashi compared to a round trip to Lusaka. Despite the fact that the distance between Dar es Salaam and the two cities is very similar, a round trip to Lubumbashi reportedly takes 4 weeks whereas it takes 2 weeks to Lusaka. This is mostly due to the customs procedures in the DRC that require all documentation to be physically verified and stamped in the capital Kinshasa.⁸⁹ Not only are the direct expenses higher for a trip to the DRC than a trip to Zambia, overhead costs which include insurance and drivers' salaries, are also higher for DRC trips than for Zambian trips (Ernst & Young, 2008).

There are also differences in transit costs for a trip to DRC and a trip to Zambia (Table 16). Once again, these costs are generally higher for the DRC than for Zambia. For example, the road tolls in the DRC are much higher than those in Zambia. Moreover, there are visa requirements in the DRC where there are none in Zambia.

⁸⁸ Interview with Transmams Tanzania.

⁸⁹ Interview with Transmams Tanzania.

Table 16: Transit costs from Dar es Salaam to Ndola and Lubumbashi, 2011

	Ndola (Zambia)	Lubumbashi (DRC)
Transit costs		
Road toll (USD)	345	895
Crew visa	-	80
Truck visa	-	25
Entry card (USD)	-	15
Carbon tax (TZS)	66 000	66 000
Insurance p.a. (USD)	920	920
Other costs		
Parking fees	-	-
Foreign vehicle fees	-	-
Weighbridge (USD)	100	-
City council fees (TZS)	25 000	35 000
Gate pass (USD)	-	50
Road permit p.a. (TZS)	743 160	743 160

Source: SUMATRA, 2011

Other operating costs are regulatory costs such as licenses, permits, and road tolls. Interviews with truck companies revealed a number of issues as far as licenses and permits are concerned. For instance, road tolls cost \$345 per truck (approximately \$11.5/ton) from Tanzania to Zambia and even more when going to the DRC, as shown above. This is a very expensive process. There is also a problem of the lack of security, reported violent crimes against truck drivers, theft and pilferage along certain corridors, especially on the route to the DRC.

Another issue is that of licensing and regulatory requirements, and mainly the transit goods license (C-28 form) from the TRA. This license can take several months to be issued. In one truck owner's case, his latest license took roughly four months to come out (he applied on 20 November 2013 and the license was issued on 13 March 2014). It reportedly takes the longest to be issued in Tanzania compared to other EAC countries (Kenya, Rwanda, Uganda and Burundi) where it takes only a few hours. In addition, the transit license is reportedly the most expensive in Tanzania at about \$700 whereas in the other EAC countries it is about \$200. The transit license is a very important document because truck owners cannot travel cross-border routes without it. As a result of the licensing delay issues, it has been very difficult for non-Tanzanian truck companies to enter the market.

New entry is thus largely limited to domestic firms. This is compounded by other regulatory requirements such as those pertaining to tri-axle heavy load trucks which means that firms such as TruckAfrica cannot carry a backload from Tanzania and will have to factor this into the outbound rate.⁹⁰ The effects of these regulations and logistical arrangements are that entry and competition may be constrained. Specifically, license delays are quite likely to have an anti-competitive effect as they limit the number of new entrants into the market by delaying and perhaps in some cases discouraging new entry.

⁹⁰ Interview with TruckAfrica.

Again, we would expect trucking companies operating along transit routes from Tanzania to factor these costs into the rates reflected in the comparisons above, and yet domestic transport has a similar rate.

The operating costs are high for Tanzanian trucking companies, especially for those that travel to the DRC. Given that the rates charged by these companies are relatively low as discussed above, we expect that the profit margins earned are fairly thin.

Competition issues in road freight

The number of licensed trucks in Tanzania increased from 36 853 in 2009 to 63 345 in 2013, and there have been larger number of trucks also used for cross border transport (Table 17).⁹¹ One of the factors which have fuelled the increase in the number of trucks is the relaxation of government controls which previously required that heavy loads be transported via rail.⁹² Another reason could be the removal of surcharges for the purchase of trucks that are over 10 years old. Finally, the economic growth in the DRC, Rwanda and Burundi, and the increase in exports to neighbouring countries, has also driven an increase in the number of trucks in the transit market.

Table 17: Number of trucks licensed in Tanzania, 2009-2013

Year	Goods services vehicle licenses
2009	36 853
2010	43 340
2011	49 057
2012	62 056
2013	63 345

Source: SUMATRA

While the number of licensed trucks presented in the table below does not reflect how many of these have been newly registered each year, how many of them are Tanzanian vehicles, and how many are foreign-registered vehicle, it does tell indicate that approximately 26000 more trucks entered the road freight industry between 2009 and 2013. With this level of new entry, one would expect the prevailing market prices to have decreased more than they have from increased competition, especially on domestic routes. This would be affected by the fact that a large proportion of new entrants has been concentrated on domestic routes and not transit freight (SUMATRA, 2011).

Although there has been the substantial increase in operators it is not clear that this meant that levels of effective competition changed, at least until 2014. There is limited information to suggest that new entry has been constrained by strategic behaviour on the part of powerful insiders such as trucking associations. Some market participants advised that rates were actually set by SUMATRA. However, it appears that an 'economic rate' is calculated by SUMATRA as a benchmark to which they compare the prevailing transport rates. This benchmark is based on the operating costs that would be incurred by a brand new truck operating selected routes. SUMATRA has historically found that their benchmark rate is higher

⁹¹ Interview with TATOA.

⁹² Interview with SUMATRA.

than the prevailing rates in the market, which suggests to them that the market is competitive, and as such they have not had to regulate prices in the market. The risk of using this methodology is that the benchmark is based on new trucks, whereas many of the operators in the market use second-hand and older vehicles, and that it does not take into account the efficiencies in operation that vigorous competition can bring (including organising return loads).

Another issue that affects transport rates is the arrangement between TATO A and the TRA which dictates that in order to get a licence a truck owner must be a member of the industry association. Despite this, our understanding from interviews is that TATO A does not set transport rates in the market and does not wield very strong influence in the market although it has a broad membership of approximately 900 companies. However, TATO A does have the powers to have a truck owner's license revoked by the TRA if certain TATO A regulations are breached. For example, if a truck owner repeatedly fails to adhere to vehicle load regulations or has undue delays in delivery of cargo, their TATO A membership and, consequently, their transit licence could be revoked. While this does not happen immediately as there are warnings issued, the threat of removal from the market as a punishment suggests that TATO A does wield a certain level of influence in the Tanzanian trucking industry.

Finally, we refer to the views of some market participants that the Tanzanian road freight sector is dominated by several powerful interest groups including government officials and large transport companies. However, we have not found sufficient evidence to confirm this argument. Indications are that this is unlikely because of the large number of companies that operate in this market. For instance, approximately 183 of TATO A's membership of 900 individual member companies are considered 'large' with very large fleets.⁹³ This large number of participants makes coordination between these players unlikely, although we do not draw further conclusions in this regard.

In terms of cross-border road freight, the merchandise imports charts for Tanzania showed that apart from Kenya, merchandise imports into Tanzania from neighbouring countries are much lower than the merchandise exports from Tanzania. While most imports are below the \$100 million mark, exports are generally above this mark and are rising. The low level of imports from its neighbouring countries suggests that outbound Tanzanian trucks may not have a great deal of backhaul on the return trip to Tanzania. That is, while there is high demand for goods from Tanzania, the highest demand for goods from its neighbouring countries is from Kenya. However, it is worth noting that trucking companies operating on some of the routes to and from Tanzania's neighbouring countries (e.g. Zambia), may be benefiting from return loads that aren't necessarily bound for consumption in Tanzania, but for transit through to the port. This may explain the relatively 'lower' transit transport rates when compared to domestic rates in Tanzania.

Conclusion

In Tanzania, the fertilizer prices were found to be relatively high, especially when compared to that of Zambia and the benchmark South Africa. Analysis in the previous section shows that increased competition in the truck industry has led to a decrease in transport prices over time. However, inefficiencies and delays related to the Dar es Salaam port have the effect of raising

⁹³ Interview with TATO A.

transport rates and thus fertilizer prices. Moreover, the relatively poor backhaul opportunities mean 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 is not the only factor explaining the margins of fertilizer prices over Zambian ones.

The entry of ETG into the Tanzanian market and its relatively lower prices (compared to TFC) reveal that prices in Tanzania could be much lower. As ETG has its own bagging facility and its own transport arm, it was able to absorb a great deal of the costs along the value chain. Moreover, it was able to increase its market share in the Tanzanian fertilizer market, which shows that the market is contestable.

5 Analysis of the state of competition in road freight and fertilizer trading in Zambia

Zambia provides an interesting case study of the linkages between competition in road freight and in fertilizer trading. On the one hand, we find that Zambia has benefited from an increasingly competitive road transport sector which has been supported by increased trade with neighbouring countries and international partners. On the other hand, Zambia has only recently prosecuted cartel conduct in fertilizer trading between Omnia and Nyiombo which, in the context of this study, means that the pricing of fertilizer is likely to have been affected not only by transport prices, but high mark-ups in fertilizer trading as well.

The copper industry which represents Zambia's primary exports in recent years, and is a large buyer of transport services, also has a significant influence on outcomes in the road freight sector. This section considers the influence of trade in copper and fertilizer on the domestic and cross-border transportation in Zambia.

Although fertilizer companies are not significant buyers compared to copper mines in Zambia, it remains likely that these firms influence the levels of competition in the Zambian market because they do tend to prefer to use one trucking company to transport their imports from the ports. For instance, one trucking company noted that they had held the contract with Omnia for several years. This is similar to the case of Yara and Kynoch discussed above. However, this influence by fertilizer companies is somewhat dwarfed by the role that the copper industry plays in influencing outcomes in road transportation in Zambia, which we discussed below.

In fertilizer, as in other bulk commodities, it is unlikely that buyers are willing to incur the costs of procuring trucking services from several different, mis-coordinated transport providers. Fertilizer importers have noted that it is simply not one of their core business functions to deal with individual transporters. This service is therefore outsourced – fertilizer importers will generally have a very small fleet of their own or none at all.

Greenbelt Fertilizers advised that they will generally contract one large trucking (logistics) firm to facilitate their imports through Beira to Zambia (including clearing). The trucking company will make the necessary arrangements with other trucking companies (sub-contract) to fulfill the order and bring the product cross-border to their warehouses. They will then use their own small fleet (for small loads) or contract with trucking companies if there are big loads to be transported from their warehouses to particular areas or customers. Similarly, trucking companies advised that Omnia in Zambia will typically outsource to a large trucking company to bring their imports into their warehouses in Zambia from different ports and then they will use a local fleet of smaller domestic truckers to move goods to outlets and dealers.

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. This suggests that users may be an important stakeholder to incorporate into the SADC Protocol negotiations and any new strategies for stimulating competition in the downstream transport sector in the region. Previous studies in this area have rarely considered the interaction between user groups and/or their agents (in some cases freight forwarders) and transport operators.

It is therefore worth considering the role of the buyers of road freight services even further. The firms that tend to win the FISP tender in Zambia seem to be able to control the means by which the product is distributed. The FISP tender has been typically won by Nyiombo and Omnia (IFDC, 2013a: 19), although we understand that Zambian Fertilizers did win the tender two seasons ago and NCZ produced large quantities domestically for the current season.

Competition in fertilizer trading

We have discussed above the allegations that corruption involving agents of government and the largest importers led to a situation where only Omnia and Nyiombo won the FISP for several years. In addition, the Competition and Consumer Protection Commission (CCPC) of Zambia made a finding of collusive arrangements between these firms. In 2013 each firm was fined 5% of their annual turnover for collusive tendering in their bids for the FISP contract through arrangements that were apparently worth \$20 million over the period 2007-2012.⁹⁴ Along with exchanging information on prices, the firms were found to have allocated markets by agreeing that each company would focus on supplying and distributing fertilizer in an allocated zone.

If the same firms generally win the tender, there are implications for competition in transport as they will most likely use their own or the same companies they usually use to transport the product. It is therefore likely that the same operators will be asked to transport fertilizer to the market. This implies that although it may be the case that the Zambian transport market is considered competitive with many different players, for bulky commodities involving large buyers of road freight services there may, in fact, be limited competition. Small entrants and regional competitors may thus not find that this market is actually contestable, even if they are more efficient. This is likely to explain the relatively high domestic rates in Zambia as well. This discussion also shows that it is important to acknowledge that any arrangements which affect competition in the road freight sector may involve horizontal agreements (in the case of Omnia and Nyiombo) and vertical arrangements between firms at different levels of the value chain. In this case, it is not sufficient to consider only the road freight transportation level of the value chain.

Market structure and competition in road freight

Studies on the Zambian road freight industry suggest that the market is highly competitive (See, for example, Raballand et al, 2007). This has been confirmed by firms that have some history of operating in the market. Indications from the interviews conducted as part of this study are that the market has become even more competitive in the past five years with an influx of both local and foreign trucking companies into the industry (Table 18). The Truckers Association of Zambia (TAZ) and TruckAfrica (Zambia) stated that one of the reasons for the increase in the trucking capacity in Zambia is that in 2008/9 the duty on the importation of second-hand commercial trucks and trucking equipment was lifted and companies were able to import second-hand commercial vehicles 'duty-free' from sources such as Europe and the US far more cheaply. This has had the effect of flooding the trucking market in the country.⁹⁵ Another reason given is the high levels of trade between South Africa and Zambia which

⁹⁴ See 'Zambia: Omnia, Nyiombo fined over U.S.\$20 million cartel' (6 June 2013), at: <http://allafrica.com/stories/201306070434.html>

⁹⁵ Interview with TruckAfrica.

resulted in a convergence of transport costs in Zambia with those of South Africa, influenced by the significant entry of South African companies to the Zambian market (Raballand et al, 2007). Rates in Zambia are considered to be low for a landlocked country. This is despite the fact that Zambia has not lifted the third country and cabotage rules, whereas South Africa has.

Trucking companies have commented that their overall profitability has been eroded over this period partly because of this influx. While the market was more competitive in terms of price, this has come at the expense of quality.⁹⁶ This is because many of the new entrants were owner-driver operations that were looking to minimise their costs by not spending on quality improvement measures such as truck maintenance, security personnel (resulting in high levels of theft), GPS tracking technology, efficient IT systems, and generally not complying with regulations regarding overloading, for instance. In addition, Zambian trucking companies are faced with a high cost environment compared to their counterparts in Tanzania in particular, driven by high fuel costs, road tolls and taxes, and levies which operators in other countries did not face. For example, truckers are required to pay road tolls of \$10 per 100 kilometres in Zambia whereas these additional costs are not levied in other countries. Transmams which operates mainly from Tanzania, confirmed that routes to Zambia were expensive as a result of tolls whereas Tanzania-registered trucks did not pay tolls within Tanzania. It was also noted that within Zambia truckers were also subject to a fuel levy, and inspection of \$6/truck for every four months, and road tax of approximately \$200/truck per year.⁹⁷ Our understanding is also that although VAT is not levied on cross-border transportation, it is applied to domestic operators.⁹⁸ The truckers' association argued that although these fees were not very high overall when considered per trip, in combination with the road tolls they further reduced the margins earned by domestic operators. This should also be considered in the context of limited return loads for truckers that only operated in the domestic market.

This has placed Zambian transporters, especially those only operating domestically where there are fewer return loads, in an asymmetric position to foreign trucking companies wherein they face high costs and have been forced to compete by continuously undercutting market rates and charging very low rates in order to get clients. While competition on price benefits users in the short term in terms of the rates that they pay, it disadvantages them in terms of the quality of service offered in the market.

On the other hand, larger companies such as TruckAfrica noted that although their profitability has decreased in recent years, generally they have been able to sustain their operations because there has also been an increase in the demand for road transportation services, and return loads from markets such as South Africa. This is directly linked to the increase in trade discussed in earlier sections. Despite the influx of trucking companies, rates charged by trucking companies have not come down and/or are higher than five years ago (about 2008/9) partly because the costs faced by these companies (e.g. fuel costs which are relatively high in Zambia) have increased in the same period.⁹⁹ This suggests that the margins of trucking companies have narrowed over the period since 2008/9, which is likely to have contributed to the narrowing differential between fertilizer prices in Zambia and Tanzania.

⁹⁶ Interview with TAZ.

⁹⁷ Interview with TAZ.

⁹⁸ Interview with Greenbelt Fertilizers.

⁹⁹ Interviews with Zambian Fertilizers and the ZCFEA.

The 'core' of the road freight sector in Zambia consists of firms with large articulated trucks (up to 56 tons) operated by small-medium sized Zambian trucking companies carrying bulk goods within Zambia (copper metal and concentrate, cement, coal, sugar, grain, and smaller containerised goods). This segment of the trucking sector is driven by agriculture and mining demand. Many Zambian companies operate at this level, transporting goods to and from inland ports (Ndola, Lusaka, Livingstone, Kapiri) or connecting with rail transport when available. The largest trucks will typically operate along Zambia's regional routes and are operated by the larger transport companies with big fleets. The rest of the market consists of small- and medium-sized operators with trucks of less than about 20 tons, mostly owned and operated by businesses (e.g. wholesalers) or owner-driver companies.

Within the market, Zambian companies were said to hold only 40% overall market share on their main transport corridors several years ago (Table 18 adapted from Raballand et al, 2007).

Table 18: Number and origin of trucks on major Zambian routes¹⁰⁰

Route	Zambia	South Africa	Other
Zambia - Zimbabwe - SA (via Chirundu)	29%	53%	18%
Zambia - Zimbabwe (via Chirundu)	40%	0%	60%
Zambia - Botswana - SA (via Kazungula)	33%	50%	17%
Zambia - Tanzania (via Nakonde)	25%	0%	75%
Zambia - DRC (via Kasumbulesa) (Zambian & transit)	50%	17%	33%
Zambia - Namibia, via Katimo Mulilo	71%	0%	29%
Zambia - Malawi (via Chipata)	63%	0%	38%
Zambia internally (Bulk Goods)	100%	0%	0%
Estimated total no. of large trucks on Zambian routes	1500	1300	1100

Source: Raballand et al, 2007

Information obtained from interviews indicates that there are still high levels of competition from foreign companies and that there has been an increase in the number of trucking operators in Zambia. Our understanding is that in the early 2000s there was a high level of demand for trucking services relative to the supply of trucks, and as a result there were substantial investments in trucking capacity by new and existing companies.¹⁰¹ In recent years, the additional supply of trucks influenced by the removal of import duties in 2008/9 has resulted in overcapacity in the market which has led truckers to reduce their rates.

We expect that the price or rates charged by transport companies (and their margins) domestically and for cross-border routes would have stabilised or decreased over the past 5 years due to increased participation. However, the information obtained in interviews and some of the estimates of domestic rates suggest that outcomes have been less clear-cut.

The following sections assess the effect of the increased levels of competition in the domestic and cross-border markets, as well as the links to buyer power in the copper markets.

¹⁰⁰ Estimates based on cross-border permits, customs records, observations at border posts, and information from transport operators (Raballand et al, 2007).

¹⁰¹ Interview with TAZ.

Increased competition in the domestic road freight market

Information received from market participants suggests that the rules against cabotage have somewhat protected domestic transporters from losing their position in the market to foreign transporters. Firms involved in the industry advised that domestic trucking companies therefore accounted for the bulk of the transportation of goods *within* Zambia which is consistent with Table 18. For instance, all fertilizer companies interviewed in Zambia prefer to use their own fleets or smaller transporters to move products from their warehouses to agro-dealers and retail outlets.

In terms of 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. Domestic operators are more likely to achieve better efficiencies operating on cross-border routes where there are opportunities for return loads. It is therefore surprising that small domestic operators do not enter the transit market. This is most likely because of the competitive disadvantage faced by these companies in terms of higher operating costs in Zambia compared to foreign companies.

Furthermore, it is more difficult for an owner-driver company to obtain a return load, particularly in a foreign country. One reason is that clients with large loads that require more than one truck will prefer to deal with a single agent or company with several trucks, as observed in the case of fertilizer companies. Another factor is that although there are economies of distance associated with servicing longer transit routes, the time it takes (including delays) to complete a round-trip to, say, Dar es Salaam from Lusaka, means that the operator can only complete one or two trips a month.¹⁰² The operator may also have to wait for substantial periods of time for backhaul if they do not have agents in the destination country or port. On the other hand, a large company with several trucks such as TruckAfrica is able to gain from having an office in South Africa and Zambia that sources their return loads ahead of time. Trucking companies interviewed from South Africa and Tanzania confirmed that they also used agents in areas such as the DRC to secure return loads ahead of time. Large transport operators (with 50 or more trucks both in Zambia and South Africa) also have more flexible operations and a broader customer profile than smaller operators and are thus often able to secure backhauls (estimated 100% backhauls at the time of the study by Raballand et al in 2007).

While there are domestic clients for smaller trucking companies or owner-driver operations to compete for, the market is difficult to operate in. This is because the market is highly competitive, and so in order to secure clients, these smaller operators (1-5 trucks) will tend to charge very low rates (e.g. \$100/ton) because they are desperate for business.¹⁰³ Interestingly, even for TruckAfrica, which is a large operation that is part of the Imperial logistics group, they tend to offer new clients a similar, low rate in order to win the contract. Then as they establish a relationship with the client, they will start to increase their rates.

This last observation is interesting - we assume that a rational business would not allow themselves to operate below cost. In this case, it is therefore likely that the rate of approximately \$100/ton (even for cross-border travel to South Africa, for instance) is likely to be a good proxy for their break-even point. TruckAfrica almost always only breaks-even when

¹⁰² Interview with Jambo Freight Forwarders.

¹⁰³ Interview with TruckAfrica.

transporting copper from Copperbelt to Johannesburg where they could earn a rate as low as \$110/ton.¹⁰⁴ However, they are able to offset this by securing consistent, lucrative return loads back from Johannesburg to Zambia aided by the fact that they have an office in Johannesburg that sources return loads for them. This is consistent with the fact that trucking companies would sometimes only charge Zambian Fertilizers approximately \$100/ton from Durban if the trucking company has already secured a return load back to South Africa from Zambia. This is compared to about \$185/ton without a return load. A difference of \$85/ton is significant, and implies a high margin when compared to a benchmark of \$100-110/ton.

Other things equal, the range of \$100-\$110/ton serves as a good benchmark for the break-even point of trucking companies operating in the Zambian market.

In terms of the rates charged by transporters along domestic routes, Zambian Fertilizers stated that all the trucking companies charged them a flat rate of K0.65/ton/km for a 30-ton truck transporting fertilizer for them within Zambia. This rate is equivalent to \$0.11/ton/km. This consistency in pricing could either reflect a highly competitive market¹⁰⁵ or anti-competitive coordination within the market. TAZ stated that the average rate for domestic transportation was approximately \$0.10-0.11 per ton per km, compared to about \$0.08 per ton per km in 2008.

Greenbelt Fertilizers on the other hand stated that the domestic rates they currently paid were approximately \$0.16 per ton per kilometre, which appear to be relatively high. However, we note that their warehouses are both situated outside of Lusaka in Mazabuka and Makushi and that they mostly supply fertilizer to the sugar industry. This industry is dominated by Zambia Sugar which holds more than 95% of the Zambian sugar market, operating from their main factory, Nakambala, in Mazabuka. From this we could infer that there is likely to be a limited supply of trucks in this area with limited opportunities for return loads for these trucks, which is likely to result in the high rate paid by Greenbelt Fertilizers. It seems unlikely that the rates in the industry as a whole would vary so significantly and we therefore place more weight on the estimates provided by TAZ (and to a lesser extent Zambian Fertilizers) which are likely to be more representative of the market.

The rates provided by TAZ are likely to be most representative of the market. From this range of estimates (\$0.10 per ton per km to \$0.16 per ton per km) we are able to estimate the cost for different distances within Zambia for a 30-ton truck, although our analysis places more emphasis on the lower bound of this range (Table 19).

Table 19: Estimates of transport rates for the domestic market in Zambia

From	To	Distance	ZMK/ton	\$/ton	\$/km/ton
Lusaka	Ndola	316	205.4 & 316	33.1 to 50.9	0.10 to 0.16
Lusaka	Kitwe	357	232.1 & 357	37.4 to 57.5	0.10 to 0.16
Lusaka	Livingstone	482	313.3 & 482	50.5 to 77.7	0.10 to 0.16
Lusaka	Lundazi	946	614.9 & 946	99.1 to 152.4	0.10 to 0.16

Source: Interview data

¹⁰⁴ Interview with TruckAfrica.

¹⁰⁵ Interview with Zambian Fertilizers.

These rates can then be compared to the domestic rates for similar distances within Tanzania and Malawi. The main observation is that these rates are generally higher than those obtained in the Tanzanian domestic market on the per ton per kilometre basis, which is a surprising outcome. This may mean that transport rates in Zambia were historically high and increased competition in recent years has only stabilised or brought prices down to these relatively higher market rates when compared to Tanzania. It is also likely that transport rates in Zambia have been affected by high fuel costs in the country. However, it is important to note the small sample from which these data have been sourced. The lower bounds of the ranges in the table are likely to more accurately reflect the prevailing rates in the market.

Nonetheless, we note that for a similar distance within Tanzania and Zambia (Dar es Salaam to Songea compared with Lusaka to Lundazi) the applicable rate is \$100/ton in Tanzania compared to between \$99.1/ton to 152.4/ton; or, \$0.11 per ton per kilometre in Tanzania compared to between \$0.10-0.16 per ton per kilometre in Zambia. Given the benchmark of \$110-110/ton discussed above, it seems domestic operators are either just covering their costs or in some cases making margins of up to 39% on costs.

Competition in the cross-border market

The study has established that there are a large number of foreign firms operating along the main routes to Zambia. This has led to a highly competitive market. Although some companies have reported that rates have not come down over the past five years, it is widely accepted that the market has become more competitive mainly due to the influx of new trucking companies. Despite this, several firms interviewed argue that there has also been a concomitant increase demand in the market which has meant that trucking companies, even smaller ones, have been able to sustain their businesses in the market. Estimates in the previous section suggest that domestic operators are able to charge comparatively high rates in the Zambian domestic market. Given the rules against cabotage, it is likely that domestic operators are insulated from the effects of the influx of foreign firms, and that it is only in the cross-border market where we'll see more competitive prices. However, it does seem likely that the domestic market has benefited somewhat from the influence of foreign companies (particularly those with offices and registered trucks in Zambia) in terms of improvements in infrastructure and the quality of the service provided, at least for those domestic firms that operate in both the domestic and cross-border market.

This level of competition and the sustained demand is likely to be driven by a range of factors, including high levels of economic growth in Zambia, high levels of imports and exports for Zambia, changes in the laws regarding the importation of trucks which have made it cheaper to do so, certain improvements in quality of service, and increased choice in terms of access to cheaper and more efficient ports. We assess these and other dynamics below.

We have summarised the estimates received from market participants regarding the rates charged for road transportation for different major routes to and from Zambia (Table 20).

Table 20: Comparison of transport prices along major routes in Zambia

From	To	Cost (\$/t)	\$/ton/km	Distance
Lubumbashi	Durban	350	0.13	2714
Durban	Lusaka	205-253	0.10-0.12	2143
Walvis Bay	Lusaka	350	0.17	2074
Copperbelt	Johannesburg	116	0.06	2000
Dar	Lusaka	140-220	0.07-0.11	1951
Johannesburg	Lusaka	154-185	0.10-0.12	1569
Beira	Mazabuka	85-120	0.08-0.11	1054
Beira	Lusaka	120	0.11	1048
Lusaka	Lubumbashi	135	0.25	545

Source: Interview data

There are some interesting observations that can be made from the summary above. The rates per ton per kilometre along the route from South Africa (Durban or Johannesburg) to Lusaka fall within a range of between \$0.10-0.12/ton/km. However, there are factors such as additional toll fees associated with travelling between Durban to Johannesburg, the cost of loading at or near the port in Durban, the fact that the route includes transit through two border posts (Beitbridge and Chirundu), high demand along routes from South Africa to Lusaka, and the additional distance travelled which mean that the actual rates in \$/ton are different on these routes. This may also be affected by efficiencies associated with the Durban port. Our understanding is that typically it would take companies about 5-7 days to travel between Lusaka and Johannesburg, which could be further reduced when the goods are actually sourced within South Africa and not brought in through the port.¹⁰⁶ This reduction in delays means they are able to earn higher margins for the overall trip.

Importantly, these rates seem to be higher than domestic rates in Zambia which is an outcome akin to the one observed in the Tanzanian market where return loads have a significant effect on transit rates. However, Zambia has also not removed restrictions on cabotage and the third country rule which is likely to be providing significant protection to domestic transporters in Zambia.

The price of transporting goods from Beira to Lusaka or Beira to Mazabuka (about 130kms south-east of Lusaka) is significantly lower than that associated with using the other ports, i.e. Durban or Dar es Salaam, although the rate per ton per kilometre is comparable, at least for the Tanzanian route. Over time, this is likely to increase the attractiveness of the Beira port particularly if there are further infrastructural improvements at the port.

Transport prices differ significantly when comparing the rates from Beira to locations in Zambia versus those from Durban and Dar es Salaam. Greenbelt Fertilizers stated that they channelled 99% of their fertilizer imports through the Beira port because of the significant cost advantages. Specifically, the firm has a plant in Mazabuka and in Mkushi and they obtain rates

¹⁰⁶ Interview with TruckAfrica.

of \$120/ton and \$145/ton, respectively from Beira to these plants. They stated that from Dar to Mkushi they would only be able to obtain a rate of \$160/ton, and up to \$260/ton from Durban to Mazabuka. The company advised that the trucking industry operating from Beira is very well 'organized' in terms of availability of trucks and efficiency.

A number of other observations can be made from the table above. Transporting goods from the port in Tanzania to Lusaka is generally cheaper than transporting goods from Durban, although there are efficiencies associated with using the Durban port as noted above.

Comparatively, the route to Zambia from Walvis Bay is still particularly expensive compared to transit from these other ports. This is linked to the lack of return loads for transporters along this route, despite the fact the available road infrastructure is good. The significance of the Walvis Bay route is however likely to grow over time. As discussed above, some of the mining companies in DRC has started to use this route.

Regarding the DRC, we note that although it covers a short distance, the price from Lusaka to Lubumbashi is very expensive at approximately double the rate per ton per kilometre of any of the other routes in the table. In the table above, the route from Lusaka to Lubumbashi has a very high price per ton of \$135/ton relative to the distance that a truck actually travels. The route from Lubumbashi to Durban is also particularly expensive. This is despite the increased potential for return loads from Lubumbashi due to the revival of ore and metal exports from the DRC, and imports to the DRC of foods items and manufactured goods as discussed in earlier sections.

These increased trade flows to areas such as the DRC may in turn have an effect on the market prices for road transport along those routes. The high rate to the DRC is likely to be linked to increased demand as well as the higher levels of risk associated with traveling into the DRC. The latter was confirmed by a number of the market participants interviewed citing substantial delays at the border posts to the DRC and significant safety risks as well. The route to the DRC (from South Africa) can take up to 3 weeks which implies significant costs. As a result, industry participants advised that although the route to the DRC was lucrative, many trucking companies did not want to travel there. This implies that there is shortage of trucking capacity on to this destination, which when combined with the increased demand, results in higher transport prices.

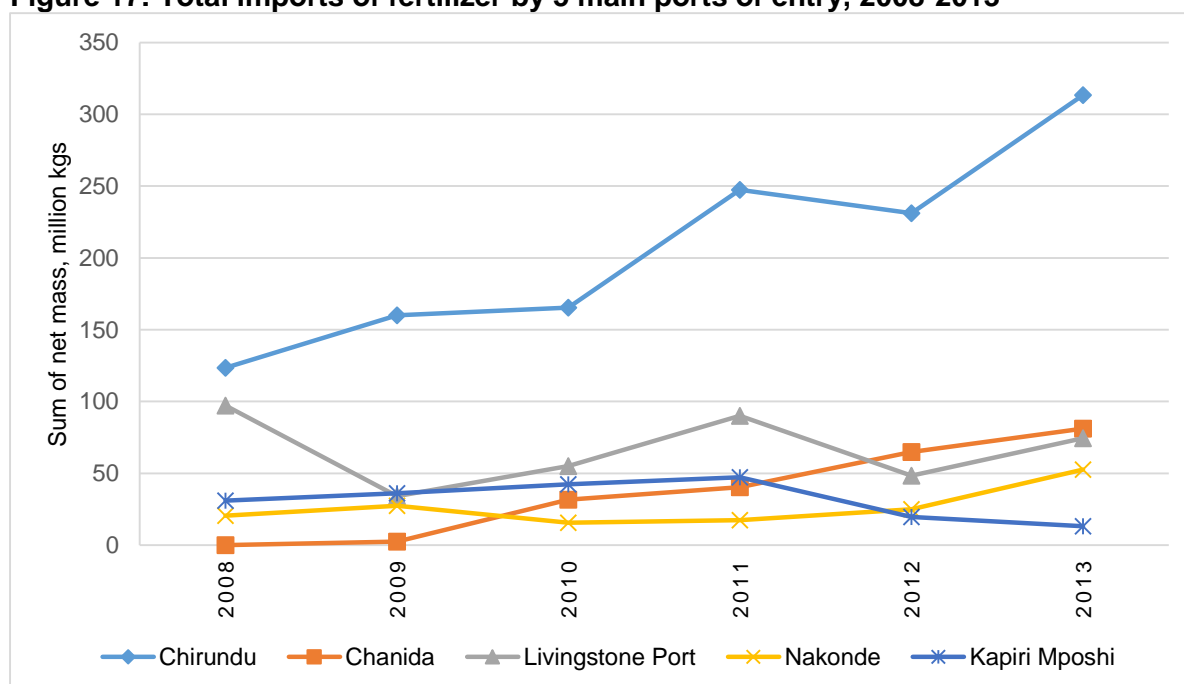
Finally, we consider that the costs of entry through different Zambian borders is also important and can affect the routes to sea ports which are chosen by customers and trucking companies. This is of course linked to the nature and destination of the goods which are being imported or exported, and whether they are destined for regional markets or international destinations. The Zambian Revenue Authority (ZRA) provided data reflecting the traffic by weight of goods carried through each of the different Zambian borders. Although several factors can affect the port of entry and exit chosen for different consignments of goods, the border traffic is likely to be indicative of the most efficient and cost-competitive routes and is as such consistent with where we have found that there is more dynamic competition in terms of the pricing of road transport services. For instance, the ZRA data reflect the fact that in recent years a large portion of Zambian exports of copper and copper concentrates are channelled through Victoria Falls (border with Zimbabwe typically on route to South Africa) and Nakonde (border with Tanzania), followed by Chirundu (border with Zimbabwe) and Kazangula (alternative border

with Botswana by ferry at times used for routes to South Africa)¹⁰⁷ which is likely to be a function of congestion and thus delays and additional costs at Chirundu.

The most important route for Zambia’s exports (mainly copper and sugar) are through Chirundu to Durban. Victoria Falls has become an important border including for transit through Zimbabwe to South Africa which is related to congestion at the Chirundu border.

In terms of the importation of fertilizer (Figure 17) and other manufactured goods (Figure 18) the most significant borders for trade are Chirundu, Chanida (border with Mozambique), Livingstone (border with Zimbabwe), and Nakonde, mainly.

Figure 17: Total imports of fertilizer by 5 main ports of entry, 2008-2013

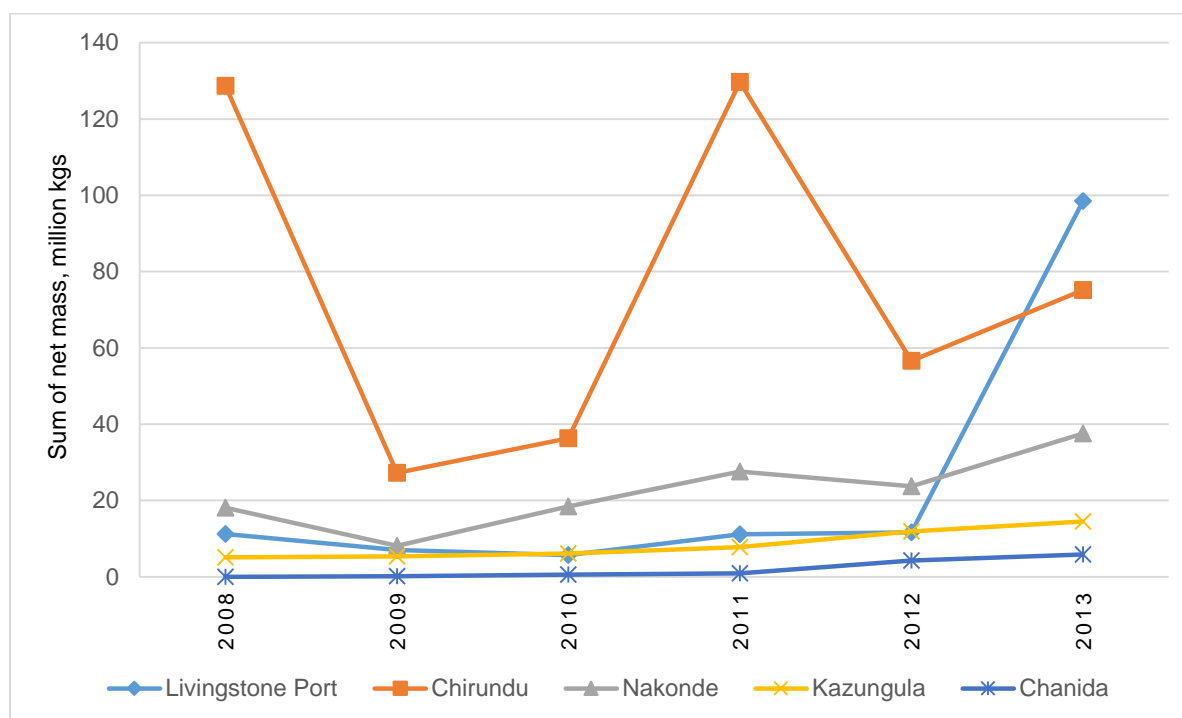


Source: ZRA

Chirundu has been the most significant border by some margin for fertilizer imports while two of the routes through Zimbabwe have been the most important for the importation of manufactured goods.

¹⁰⁷ See Raballand et al, 2007.

Figure 18: Total imports of manufactured goods by 5 main ports of entry, 2008-2013



Source: ZRA

Overall, the data on border traffic highlights the point made in Raballand et al (2007) that road freight traffic is significant along the north-south corridors. For fertilizer imports in particular, it does not seem that there has been a shift to using the route via Chirundu away from other routes, but rather the data suggest a change in relative prices and efficiency which has led to increased usage of the route from South Africa. Of course this is also related to the fact that Zambia imports a significant amount of their fertilizer from suppliers in South Africa.

Finally, it is interesting to note that the route via Nakonde from Tanzania is not more significant however this is likely to be because we are considering fertilizer and manufactured goods which Zambia sources from South Africa as well. As discussed in earlier sections, imports originating from Tanzania to Zambia are limited. In terms of transport rates, the more popular routes, from South Africa for example, are likely to be the most competitive although rates may not necessarily be lowest along those routes due in part to capacity constraints. This could occur if the many truck companies operating along this route are using most of their capacity (truck availability) due to high demand. This is more so if they can obtain return loads as well.

The discussion above suggests that 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, other than in the case of the DRC where there are also other associated risks that are factored into the price. This is exacerbated by the lack of an efficient rail alternative for bulk goods transport, such as for copper and fertilizer. The issue of return loads may in fact be the most important variable affecting transport rates in Zambia, as a landlocked and growing economy. It is therefore worth considering the important role that large buyers such as copper mining companies play in influencing return loads and therefore prices in the

Zambian market. Large buyers in Zambia also influence the domestic rates charged in the market.

The influence of powerful buyers in copper

Large customers will by-pass the forwarding company and negotiate directly with the trucking company when they are able to determine that that trucking company is likely to already be transporting goods down to the ports.¹⁰⁸ In this way the buyer leverages the fact that the truck will already have a load to the port (e.g. transporting sugar to the port for exports to Europe) to negotiate a better rate for transporting their fertilizer back from the port to Zambia.

In terms of copper, the copper mines are able to significantly influence prices in the market which tends to drive price up.¹⁰⁹ The copper mines are able to apply a 'take it or leave it' approach to the prices they offer trucking companies.¹¹⁰ This is because there are many trucking companies that are willing to transport copper from the mines such that the mines can readily switch to another trucking firm if one company finds the rate that is being offered to be unacceptable. It is also important to have good direct contacts and long-term relationships with the copper companies to make sure that trucks that are sent from South Africa to Zambia are able to come back with some backhaul.¹¹¹ Most trucks will come back empty because they are not able to access the copper market. Some trucks will even wait at the mines for some time until a backhaul becomes available. Another trucking company that also operates in Tanzania stated that they make use of an agent with connections to the copper mines (in Zambia and the DRC) to make sure that they secure a return load to Dar es Salaam.

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.¹¹² It is therefore better to secure a load from Johannesburg as well (e.g. oil, fertilizer, steel, mining equipment, processed products such as soft drinks, raw plastics for bottling etc.) where you can obtain a higher rate. Large companies such as TruckAfrica seem to manage the risk of not obtaining backhaul through having dedicated offices and fleets in both Zambia and South Africa. This is consistent with the findings by Raballand et al (2007) in terms of South African companies preferring to by-pass the cabotage rule by buying trucking companies in Zambia. This, of course, is likely to be far more difficult for a smaller trucking company to do which is likely to raise their costs substantially.

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%.

We argue that although 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.

¹⁰⁸ Interview with ZCFAA.

¹⁰⁹ Interview with Hill & Delamain.

¹¹⁰ Interview with TruckAfrica.

¹¹¹ Interview with TruckAfrica.

¹¹² Interview with TruckAfrica.

Conclusion

In conclusion, a number of factors explain why Zambian fertilizer prices became much more competitive by 2013. 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 provide 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 reduces 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 CCPC. This was linked with changes to the FISP tender which made it much more contestable. This has been reflected in the substantial decline in Omnia and Nyiombo's market shares since 2009 (see Table 9), and the corresponding increase in ETG's market share.

6 Analysis of the state of competition in road freight and fertilizer trading in Malawi

Fertilizer prices in Malawi have been substantially above those in neighbouring countries, suggesting problems in transport and trading including related to inefficiencies, costs, regulatory hurdles and low levels of competition. In particular, retail prices for Urea averaged around \$200/ton (or 25%) more than in Zambia in 2013 which we estimated could amount to a difference in expenditure on Urea of approximately \$36 million if Malawian prices were the same as those in Zambia.¹¹³ This compares with 2010 when prices were in line with those in Zambia. Our assessment is that prices in Zambia reflect more competitive outcomes including greater efficiency in road freight, while prices in Malawi and Tanzania remain significantly influenced by low levels of competition in fertilizer trading and transport. This section therefore assesses regulatory and market arrangements account for this significant difference in prices between Malawi and Zambia.

In terms of participation in the value chain, the private sector plays a major role in the procurement and importation of fertilizer, including for the large quantities subsidized under the FISP. It is estimated that around one half to two thirds of all fertilizer in Malawi is sold under the subsidy programme. The private sector also transports locally within Malawi, however, it is not involved in retail as fertilizer coupons are redeemable only at ADMARC and SFFRFM unit markets.

It is possible that the value of the coupons (as they require very little contribution from the farmer, being equal to almost the whole price¹¹⁴) and the weakening of private sector participation have undermined competition at the retail level so inflating retail prices.

Malawi imports the great majority of its fertilizer from and through South Africa, at distances which are not substantially different to Zambia. The exception was in 2008 and 2009 when significant quantities were also imported through Mozambique (from Beira) – approximately the same in those years as was imported from South Africa. This in itself is interesting as these years are before the improvements and increased volumes through Beira which were associated with improved efficiencies at that port. We return to this below.

Market structure in fertilizer trading

There are relatively high levels of concentration at the levels of fertilizer trading and in road freight, storage and distribution. While there are apparently low entry barriers and the potential for many small firms to operate, in practice there are reasons which favour larger firms both in terms of the nature of the business and due to the effect of regulations. The operation of the tender for the FISP has also favoured larger and international companies (IFDC, 2013b).

The Malawi market has been around 300 000 tons per annum, with around half being accounted for by subsidized fertilizer under the Farm Input Subsidy programme (FISP). The main fertilizers used are Urea and D-Compound (an NPK blend, 7-14-7). The market is supplied by most of the same companies operating across the region namely Omnia, Yara,

¹¹³ This difference could be even greater if we considered all fertilizer imports and not only Urea.

¹¹⁴ Just 3% in 2012/13 according to Chirwa and Dorward (2014).

Nyiombo and ETG. There are also some local companies such as Optichem¹¹⁵ and Farmers World.

Farmers World and Agora had been identified as being the dominant suppliers in the mid-2000s (see Likoya and Mangisoni, 2010) although it appears these companies are in fact part of the same Farmers World Group rather than rival companies. Farmers World Group has been developing the import routes from the Mozambique ports of Beira and Nacala and has further developed a network of retail outlets and agro-dealers across Malawi. ETG has apparently also been using Nacala (IFDC, 2013b).

Private traders supply the fertilizer for the FISP, under the annual tender, which is then distributed and retailed through ADMARC and SFFRFM (as described above). There are non-subsidised, commercial sales effectively in parallel with the distribution of the FISP fertilizer through agro-dealers and private outlets of the main fertilizer companies. Those companies winning the FISP tender are in a better position to also supply the commercial market as they can organize larger shipments and the related logistics and transport. Warehousing and storage of fertilizer is also regulated.

Competition in road freight in Malawi

Malawi continues to have extensive regulation of road freight, which is compounded by additional regulations that apply to the transport and storage of fertilizer. It still enforces the rules including cabotage and the third country rule, as does Zambia. However, it is in the impact of the regulations that the effect is felt and which reveals very different outcomes with Zambia for these two landlocked countries. Zambia has improved the working of the regulations such that the market has effectively become contested by regional trucking operators, with substantially lower resultant transport costs.

Road freight matters even more as low levels of efficiency as well as restrictions regarding the draft of vessels at Beira have meant that after 2009 fertilizer imports shifted back once again to overwhelmingly being sourced from South Africa. This means a much longer travel distance than from the Mozambique ports.

Overall it is estimated that there are more than 20 to 30 transport companies that could be used by fertilizer suppliers in Malawi, however, the market is effectively dominated by a very few large players.¹¹⁶ In 2005, most truck operators had less than 10 trucks each, with only 10 operators having at least 50 trucks (TAG, 2007: 17). However, it is important to note that the majority of trucking companies, that is, those with small fleets may not necessarily participate in the same market segment as the larger companies. Thus, the level of competition depends on which part of the market one is looking. Customers who would need large consignments of goods to be transported such as sugar or tobacco bound for the export market or cement that is being imported prefer to deal with the larger haulage companies who have a large fleet of trucks as they require reliable and flexible service (TAG, 2007: 18). As a result, it is likely that there is high concentration in the market for the more lucrative, high volume, high revenue

¹¹⁵ Optichem had historically been associated with Kynoch of South Africa, which was acquired by Yara and then sold to Farmsecure.

¹¹⁶ Interviews with STACO and Combine Cargo.

transportation. The lower end of the market seems to be much more competitive as most truck companies have less than 5 trucks.

Some estimates put the current combined share of the three largest road freight operators, Combine Cargo, SDV Bolloré and Manica, at between 55% and 70%.¹¹⁷ SDV Bolloré is part of the global Bolloré group which does freight forwarding and has a large fleet of trucks operating across southern and East Africa. Manica is a regional trucking group across Southern Africa and is part of the South Africa Bidvest group. In addition, with regard to fertilizer, companies such as ETG and Farmers World (Transcargo) are vertically integrated with their own road freight and freight forwarding businesses, respectively, across the region. There are also forwarding companies that operate in the same space with some of these clearing agents also having trucks. For example, Combine Cargo is a Malawian company which does not itself have a big fleet with only 10 to 15 trucks. Since the core of their business is freight forwarding, they normally outsource transportation services.¹¹⁸

There are a number of factors increasing the costs of road freight in Malawi. These include the relatively small size of the market and there being few opportunities for return loads.¹¹⁹ Due to the lack of backhaul from Malawi to other countries, e.g. South Africa, the import transport rates (i.e. bringing goods into Malawi) will generally be higher than the exporting rates. One of the few advantages of operating in the Malawian market was that there are no weight limits for trucks which means trucking companies can benefit from earning additional margins (in the short term) on larger loads.¹²⁰

As far as competition in the domestic market is concerned, the cabotage rule helps Malawian companies to secure local business. The existence of the cabotage rule is understood to have resulted in the entry of new truckers. In the past few years there has been growth in the number of truckers, both small and big companies. However, in the market for international freight or cross-border trade, there is competition from international trucking companies such as SDV Bolloré and South African firms.

When considering the domestic road freight market, an important participant is the Road Transport Owners' Association (RTOA). The RTOA is a road freight association in Malawi. The RTOA does not deal with clearing and forwarding operations but looks after the interests of its members. While it is not compulsory to be a member of RTOA, the association does give an indication to the market of what rates should be charged in the domestic market. This raises concerns about dampening competition and providing a focal point around which domestic players can coordinate.

An additional aspect of importance in this assessment relates to the transportation of fertilizer. The Malawian government, through the FISP programme, subsidises not only the purchase of fertilizer but its transportation. In particular, through the FISP programme specific truckers are identified, on an annual basis, to transport subsidized fertilizer. Only truckers who have been appointed to provide transport for the programme via a bid can do so. Ultimately, individual trucking companies place bids in a tender process, with the most appropriate bids being awarded contracts. The issuing of these contracts may also have an effect on the overall outcomes in the domestic freight transport market in Malawi, particularly in scenarios where

¹¹⁷ Interview with Combine Cargo.

¹¹⁸ Interview with Combine Cargo.

¹¹⁹ Interview with STACO.

¹²⁰ Interview with STACO.

the price as set by government is seen as a pricing point on which other market participants can base their prices.

Domestic and cross-border transport rates¹²¹

Local rates are much higher than cross-border rates as reflected in a number of studies (see e.g. IFDC, 2013b). This is likely to be a result of a number of factors. First, the cabotage rule weakens competition in the domestic transport market. Second, the RTOA apparently has a set of recommended rates for the domestic market.

Third, there are higher costs such as for fuel and spare parts, as well as poor road conditions (IFDC, 2013b: 32).¹²² Infrastructure quality has been identified as an important contributor to regional differences in transport costs (Lall, 2009: 2). The increased operational costs due to poor feeder roads are aggravated by low trade volumes between rural locations and market centres. While Malawi has been spending on improving the road network, road maintenance expenditure is still very low – it falls 24% below what is required to sustain the infrastructure (Foster & Shkataran, 2010). Moreover, only 26% of Malawi's population lives within 2km of an "all-weather road".

Fourth, the likelihood of an empty return load is much higher when transporting goods within Malawi than across Malawi's borders, while backhauls from Malawi are also less likely than from other countries. Finally, domestic routes are generally much shorter than international routes and have much lower average loads implying higher fixed and transaction costs (AFDB, 2009: 53).

These factors mean that only a few transport service providers enter the market, charging disproportionately higher prices to cover fixed costs and maximise mark-ups (Lall et al, 2009: 2). And, in terms of freight costs for imports, because Malawi is a net importer with low likelihood of return loads, the rates are dictated by inbound cargo, which covers all costs and provides a margin, and "loads negotiated from Malawi are a bonus" (DTIS, 2002: 21). Malawian operators are mainly small-scale but even the larger ones have operating costs that are higher than the international benchmarks. For example, many Malawian operators do not have depots in other countries such as South Africa and Zimbabwe so it makes maintenance of vehicles very difficult.

Different estimates place the rate for international shipments to and from Malawi at \$0.06-0.09 per ton per km (Tables 21 and 22). This compares with an average rate for domestic transport estimated in 2008 at \$1.63 per ton per kilometre (Table 21).

¹²¹ The rates used in this section are consolidated from different sources.

¹²² The RTOA is also reported to have requested government to consider a waiver on spare parts and equipment "so that they compete favourably with their counterparts in the region", The Nation (2013).

Table 21: Transport rate estimates for commodities for Malawi, 2008¹²³

	Rate per ton per km (MK)	Rate per ton per km (\$)	Distance (km)	Empty backhaul	Average load (tons)
Domestic	228.4	1.63	85	27%	2.5
Agro town -Exporting port	10.3	0.07	2 273	11%	24.6
City - Exporting port	12.1	0.09	2 012	5%	19.9

Source: AfDB (2009)

Table 22: Transport rate estimates for commodities for Malawi, 2012

	Rate (\$/ton)	Rate (\$/ton/km)
Beira - Lilongwe (947.6 km)	77 (general goods)	0.08
Dar es Salaam - Lilongwe (1515.2 km)	90 – 125 (fertilizer)	0.06 – 0.08

Source: IFDC, 2013b

The Malawi rates for cross-border transport are not out of line with those for the other countries. However, it is noted that the price of transporting fertilizer depends on the season and also on the availability of backhaul for the transporter (IFDC, 2013b: 31). And, while the local transport rates in Malawi appear substantially higher, the rates offered by ADMARC for the domestic transportation of fertilizer for the subsidy programme was K35 per ton per km which is approximately \$0.10 per ton per kilometre, while transporters were demanding between K45 and K50 (between \$0.13 and \$0.14) in order to break-even.¹²⁴ We note that the Competition and Fair Trade Commission of Malawi (CFTC) has launched an inquiry into the trucking industry due to high transport costs being a driver of high trade costs in Malawi (Helema, 2014).

Port efficiency is an additional factor which could make a substantial difference for Malawi. The closest port of Beira has a relatively low docking capacity at between 10000 and 15000 tons which means that only a few vessels at a time can be offloaded leading to congestion and delays (which in turn result in demurrage charges being incurred) (IFDC, 2013b: 31). While Nacala has a higher docking capacity and is the closest to Lilongwe, it is plagued by slow operations and a slow rail service. As noted above, after 2009 imports returned to being predominantly sourced from South Africa, which places Malawi on the same footing as Zambia.

Conclusion

Fertilizer prices in Malawi are approximately \$200/ton higher than in Zambia, which can be explained by a combination of factors, including high domestic transport rates and fertilizer price distortions caused by the subsidy programme.

While transport costs do play an important role in the difference in fertilizer prices, there are other significant factors at play. Domestic transport rates in Malawi are between \$0.13 and

¹²³ The exchange rate is that which prevailed in 2008: US\$1 = MK140.5259, from the Malawi National Statistical Office.

¹²⁴ According to The Nation (2013b).

\$0.14¹²⁵ per ton per kilometre which are higher than the corresponding estimate provided by TAZ in Zambia of \$0.10 and those in Tanzania which lie between \$0.09 and \$0.12 from Dar es Salaam to different locations in Tanzania in the period. This is likely to partly relate to higher costs and the substantial lack of return loads within Malawi. However, a key difference between the Malawian and Zambian markets is the availability of backhauls. While transporters delivering imports into Zambia have a high likelihood of transporting backhaul, mostly in the form of copper, out of Zambia, Malawi does not have the same conditions. The lack of backhaul when transporting fertilizers into Malawi means that the transport rate for transporting goods into Malawi will factor in the empty return load. This is reinforced by the rules against cabotage and the practice of recommended market rates followed by the RTOA. However, these regulations are also present in Zambia but it still has far lower fertilizer prices than Malawi.

Higher transport costs (both international and local) are estimated to account for about \$110-150/ton¹²⁶ of the \$200 difference. This suggests that arrangements related to fertilizer itself play a substantial part in explaining the higher prices. The subsidy programme in Malawi subsidises a very high percentage of the fertilizer price (97%) which effectively creates a price floor for fertilizers. This floor is in effect significantly higher than our benchmarks of what would be a competitive price. In addition, the fertilizer market is highly concentrated with various obstacles to being an effective competitor. Given the cartel conduct uncovered in Zambia and South Africa, there may be similar arrangements in Malawi.

¹²⁵ This is based on the rates demanded by transporters for delivering fertilizer as cited in a previous paragraph.

¹²⁶ Calculated using the rate estimated in Table 22 above of between \$0.06-0.08 per ton per kilometre for the distance from Johannesburg to Lilongwe.

7 Drawing together the threads

The picture that emerges of developments in road freight and fertilizer trading in Tanzania, Zambia and Malawi is naturally complex due to the combination of changes taking place. In this section we sort through the information across the countries and highlight the bigger themes. At the outset it is important to recall the dramatic change in the context which has taken place. The growth in regional trade is dramatic. This makes the effects of intra-regional freight all the more important. It also means that there has been considerable interest and changes including new and growing participants and related investments. While these represent improvements, and some changes have probably yet to impact on the observed outcomes, the counterfactual should be considered, that is, what would have been the effects if there had been greater reform aimed at mutually beneficial integration through more efficient road freight. Seen in these terms, the poor outcomes for end users (farmers in this case) should be cause for alarm, notwithstanding the improvements.

There has been a substantial increase in competition in road freight since 2007/08 especially in Zambia. This is evident in outcomes but is not, however, due to one clearly identifiable change that was made in the regulatory framework. The outcomes include:

- A substantial increase in the number of participants in road freight, in particular, increased participation of regional firms from Zimbabwe and South Africa in the Zambian market.
- A reduction in the prices of imported fertilizer in Zambia relative to Tanzania from a difference of \$119/ton in 2010 to just \$6/ton in 2013. Malawi prices have moved from being close in 2010 to being \$198/ton higher than those in Zambia in 2013. More competitive prices in Malawi and Tanzania could have resulted in reductions in expenditure on Urea alone of approximately \$36.4 million and \$15.2 million, respectively.

By comparison, in Tanzania:

- There has been strong growth in road freight
- Interviewees suggest margins have reduced in road freight
- However, our assessment with regard to fertilizer is that outcomes are not competitive. There are wholesale margins in fertilizer of around \$160/ton over the CIF price and overall the margin by which prices exceed international benchmarks have grown significantly. In simple terms, Tanzanian farmers have been paying around \$100 to \$150 more than they should, when compared against benchmarks of relatively competitive prices.
- The very recent growth of ETG illustrates the big margins that appear to be 'on the table'. ETG's increasing competition has meant discounting prices which should have an effect on market prices.
- A key factor is ensuring that the market is contestable in that rival suppliers are able to access the necessary facilities such as port off-loading, storage and bagging which has opened up in recent years.

In Malawi:

- There has been an increase in trade with neighbouring countries (particularly Zambia and Tanzania), suggesting an increase in demand for regional road freight services
- Prices in the domestic market are substantially greater than cross-border road freight prices.
- Prices are very high compared with those in Zambia, and other benchmarks.

What made the difference in Zambia?

- The increased investment in trucking services in Zambia, including that made by small and medium players, is partly due to the attraction of increased demand due to the growth in neighbouring DRC and in the Zambian economy itself – in other words, the wider context matters. This investment means larger trucks, more density on routes and greater competitive rivalry.
- In particular, the resurgent copper price and related increased mining activity meant two-way trade along the route to Durban and thus backhauls for fertilizer and other bulk goods being transported into Zambia. This substantially reduces the transport price for a one-way load as the hauliers offer prices on the expectation of a backhaul.
- South Africa lifted the cabotage restriction which allowed for more attractive opportunities for those operating along the routes from Zambia to the Durban port.
- The stance in Zambia has broadly moved to favouring the customers of trucking services (in other words, producers and consumers in the economy) and away from powerful local road freight interests. The single permit system for Zambia, Zimbabwe and South Africa has made it much easier to operate across the countries and Zambia has also implemented most of the SADC protocol. However, Zambia has not removed cabotage and the third country rule. Instead, it is about the stance adopted which has not obstructed participants. This contrasts with the delays in obtaining necessary permissions which exist in other countries and which can substantially add to costs, especially for smaller participants.
- Increased participation of new players in Zambia in fertilizer trading (albeit established players in other countries in the region). The rapid growth of ETG in Zambia has impacted on the market as ETG is integrated into road freight and engaged in trading in agricultural commodities more widely.
- Furthermore, the substantial decline in Omnia and Nyiombo's market shares since 2009 (see Table 9), and the corresponding increase in ETG's market share, shows that the fertilizer market in Zambia is contestable.
- Linked to the greater rivalry in fertilizer trading is the uncovering by the CCPC and ending of the cartel in 2011/12 in fertilizer by Nyiombo and Omnia, which had been reinforced by requirements restricting potential rivals from effectively competing for the government (FISP) fertilizer tender.

- Greater inter-port competition with Beira becoming more attractive as an alternative to Dar es Salaam and Durban, albeit with constraints given its size and the transport routes from Beira to inland countries such as Zambia.

In Tanzania, substantial and increased margins of local fertilizer prices over international prices (measured on both a fob basis and estimated on a landed basis) indicate that more competitive outcomes appear not to have developed. There are a number of factors which can explain this, as follows:

- Inefficiencies and obstacles related to the port of Dar es Salaam. These include long delays experienced by some operators in getting the necessary approvals.
- Until quite recently, the reliance on the bagging facilities provided by the port.
- The local transport costs to distribute throughout the country, the fact that there are relatively poor opportunities for backhauls and the relatively low volumes being supplied meaning smaller trucks on sometimes poor local roads.
- The continued imposition of rules of cabotage meaning that when loads are delivered from other countries to the port at Dar es Salaam, road freight operators from these countries cannot pick up a load for delivery to another destination in Tanzania. This contrasts with loads delivered to Durban where return loads can be collected. Given that Dar es Salaam is a major port, the more appropriate comparison of regimes is perhaps with South Africa (for the alternative transport to Zambia) than the regime in Zambia.
- The border at Nakonde between Tanzania and Zambia is reported to be much slower than the improved border post between Zambia and Zimbabwe at Chirundu. This is added to the agreements between Zambia, Zimbabwe and South Africa based on the precepts of the SADC Protocol which include the use of a single permit system.
- Lastly, we note again that the prices which are recorded are list prices across the country (including more remote and smaller markets) and may not fairly reflect transactions prices in the larger agricultural markets where discounts may be substantial, however, this has been the case over the period and so does not account for the substantial changes seen.

In certain respects, the results in Malawi point to a lack of competitive outcomes in the domestic road freight market, especially since the fertilizer prices are so much higher than those in Zambia. A number of factors have been identified which, particularly when considering the outcomes in the domestic market, can collectively explain the relatively higher price. These are as follows:

- The domestic transport rates were considerably higher than the cross-border transport rates, indicating that local fertilizer transportation could be affected by prices
- By effectively imposing a price floor on fertilizers, the subsidy programme is likely to keep fertilizer prices artificially high

- The lack of backhauls when transporting fertilizers into Malawi means that the transport rate for transporting goods into Malawi will factor in the empty return load and thus push up the price of transportation

In our assessment taking this basket of factors into account still leaves a substantial margin unaccounted for which presumably reflects the margin for the trader and/or freight operator. This is evident from the fact that the margin over the international prices increased substantially from 2011 to 2012 while the above factors continued to apply in broad terms across recent years (at least we do not expect they deteriorated between 2010/11 and 2012/13). In addition, the calculations of prices in Mbeya, some 828km from Dar es Salaam, indicate substantial mark-ups on top of the not insignificant port and importer charges.

In effect, around \$100-\$150 of the price is unaccounted for, which is around the differential between the Zambian and Tanzania prices that has been eroded between 2010/11 and 2013. It also appears as if the most effective, vigorous and growing competitor (ETG) has, in 2014, eaten into this margin as it has competed vigorously for customers and has also invested in building a distribution network with agro-dealers. It is interesting to understand what has been required for it to be an effective competitor. The critical factors have included being able to access port facilities in Dar es Salaam without delays, being able to use the independent bagging facilities which have been established by DCG and being able to obtain the licences required for its vehicles.

While we have not been able to fully evaluate arrangements in Malawi, we note that there are even greater restrictions in place regarding transportation and storage, coupled with the lack of backhaul. The size of the subsidy on a per unit basis has also contributed to keep prices higher. In addition, the concentration of fertilizer trading and the persistent size of the margins over the period suggest that there may be collusive conduct, as uncovered in other countries.

We also note that while increased international participation has been part of better outcomes in road freight, this does not mean competition is inconsistent with stronger local participation. However, policies to support local activity, including in fertilizer blending and trading, should not be crafted in such a way as to protect *particular* interests rather than stronger local activity in general. And, the greatest effect is on the ultimate users, in the form of lower costs of agricultural production and lower cost market access for the products produced.

8 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 (as is the case with ETG which supplies fertilizer and trades in other commodities across the East African region).

Prices paid by farmers for fertilizer in the countries studied are much higher (when the subsidy programmes are not taken into account) than in the sources of fertilizer such as the Middle East and Europe. They have also been substantially higher than in South Africa, where some fertilizers such as CAN, MAP and DAP are produced and which is able to import other products such as Urea. For example, average prices over 2010 to 2013 have been as much as \$674/ton higher in Malawi, and \$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.

There have been very substantial increases to the costs related to freight, from port to end customer across the countries. The factors identified are unsurprisingly in line with the many studies that have been done in the area, highlighting: regulations and restrictions – in terms of formal rules, but importantly in terms of delays and unpredictability; market structure and organisation of trucking industries; and low productivity in the trucking industry due to infrastructure constraints.

In the organisation of the trucking industry and rivalry there have been improvements, as well as in productivity with investment, scale and better backhaul opportunities. This comes against the fact that road freight has low intrinsic barriers to entry but typically strong local interests. The strong growth in demand for road freight has played a role in bringing in more players, however, the changes in licensing and border regulations in Zambia, Zimbabwe and South Africa have also been significant.

In fertilizer trading the markets have been much more concentrated with two or three firms typically accounting for the bulk of the market. The position of these firms have been bolstered by arrangements such as access to port facilities (in Dar es Salaam) and the terms on which firms could bid to supply the FISP tender in Zambia until recently. The concentration has also been linked to international anti-competitive arrangements as highlighted by the South African fertilizer cartel which ended in around 2006 and involved some of the big regional suppliers such as Yara and Omnia. The finding of a cartel from 2007 to 2012 in Zambia of Omnia and Nyiombo reinforces this. Our study suggests that there is still cause for concern, especially in Tanzania and Malawi, which would ultimately require an investigation to evaluate, although at

the same time there are indications of greater rivalry through aggressive growth of smaller players.

Recommendations

Based on our analysis, we make the following recommendations:

Careful monitoring of fertilizer prices: High relative prices of fertilizer result not only from high costs of transportation, but from possible anti-competitive arrangements and inefficiencies along the value chain. 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: Anti-competitive arrangements have a direct effect on fertilizer prices and transport rates. 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 fertilizer 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 fertilizer 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.

Considering the effect of fertilizer subsidy programmes on competitive outcomes: The design and implementation of subsidy programmes can have a direct effect on the prices of fertilizer. For Malawi, we recommend that the subsidised price be set at a competitive level to avoid creating an effective price floor in the market. Generally, the large scale of the subsidy programmes in Tanzania, Zambia and Malawi, and the levels of concentration in fertilizer trading are factors which when considered together can facilitate collusion between large fertilizer companies and dampen competition. This has the effect of increasing prices to those not accessing the subsidy (as well as making the subsidy more expensive than it should be for a given quantity). It is therefore important for competition authorities and government agencies in charge of the subsidy programmes to continuously monitor their implementation.

Remove recommended transport prices in Malawi: The Road Transport Operators' Association in Malawi should be required to stop the practice of recommending transport rates as this serves as a benchmark in the market resulting in distortions in competition and high domestic prices. Assessing the influence of associations on pricing in other countries and the role of fertilizer associations across different countries can be a component of competition authorities' studies and investigations.

Areas for further work

The desktop research of Malawi showed that there are likely to be anti-competitive arrangements between firms in fertilizer trading and in road freight. While we acknowledge the market enquiry into the transport sector being carried out by the Competition and Fair Trade Commission, we suggest that a similar study be conducted into fertilizer trading in Malawi. Further research should also look at possible anti-competitive arrangements in fertilizer trading in Tanzania.

Investment and improved efficiencies in Beira and Nacala ports and the routes inland, including the borders, will likely mean lower and more competitive prices for landlocked countries such as Zambia and Malawi. The steps required to realize these gains could be assessed more fully.

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Appendix 1: List of interviewees

Interviews conducted in Tanzania:

Contact	Company/Organisation	Designation	Date	Sector
Godfrey Gabriel	Tanzania Fair Competition Commission	Head of Competition Research	31 March 2014	Government
Godlisten Mmari	Transmams Tanzania Ltd	Director	31 March 2014	Transport company
Salum Mkumba	Tanzania Fertilizer Company	General Manager	31 March 2014	Government
Fahamuel Mnkeni	Surface and Marine Transport Regulatory Authority	Regions Operations Manager	1 April 2014	Government
Michael Paul	Surface and Marine Transport Regulatory Authority	Statistician	1 April 2014	Government
Banwari Jhawar	Export Trading Group	Agro Inputs Head	1 April 2014	Fertilizer importer
Canuth Komba	Ministry of Agriculture, Food Security & Cooperatives	Principal Agriculture Officer	1 April 2014	Government
Susan Ikerra	Tanzania Fertilizer Regulatory Authority	Acting Executive Director	1 April 2014	Government
Hussein Wandwi	Tanzania Truck Owners Association	Executive Operations Officer	2 April 2014	Truck Owners' Association
Stephen Ngatunga	Tanzania Freight Forwarders' Association	President	2 April 2014	Freight Forwarders' Association
Jaisun Tank	Shivlal Tank & Company (Staco AgroChem)	Chief Executive Officer	2 April 2014	Fertilizer importer
Baldwin Kachenje	Jambo Freight	Operations Manager	3 April 2014	Freight forwarding company

Interviews conducted in Zambia:

Contact	Company/Organisation	Designation	Date	Sector
Valerie Sesia	Customized Clearing and Forwarding Ltd	Managing Director	7 April 2014	Freight forwarding
Emmanuel Chokwe	Competition and Consumer Protection Commission of Zambia	Economist	7 April 2014	Government
Yenda Shamabobo	Zambia Revenue Authority	Statistician	8 April 2014	Government
Frida Banda	Hill & Delamain Freight & Logistics	Operations Manager	8 April 2014	Freight forwarding & transport
David	TanFreight Africa Ltd	-	8 April 2014	Transport company
David Bradshaw	Greenbelt Fertilizers	General Manager	9 April 2014	Fertilizer importer
David Chimfwembe	Zambia Customs and Forwarding Agents Association	President	9 April 2014	Freight forwarding
Chunky Kanchele	Road Transport and Safety Agency (Zambia)	Statistician	9 April 2014	Government
Nicholas McEvoy	TruckAfrica Zambia	General Manager	9 April 2014	Transport company
Daniel Soko	Zambian Fertilizers	Purchasing Manager	10 April 2014	Fertilizer importer

Interviews conducted in South Africa:

Contact	Company	Designation	Date	Sector
Marinda Hutten	Omnia Fertilizer (South Africa)	Financial Manager	13 March 2014 (telephonic)	Fertilizer importer
Trevor Dzunani	Yara Africa (South Africa)	Administrator	19 March 2014	Fertilizer importer
Wilmar Nieuwoudt	TruckAfrica (South Africa)	Operations Director	20 March 2014	Transport company
Richard Chiputula	Competition and Fair Trade Commission of Malawi	Director: Mergers and Acquisitions	27 May 2014 (telephonic)	Government
Robert Mtonga	Truckers Association of Zambia	Chief Executive Officer	5 April 2014 (telephonic)	Truckers association
Michael Somanje	Combine Cargo (Malawi)	Operations Manager	16 May 2014	Freight forwarding