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By

Ms T Davids[1], Mr R Gitau[2], Prof FH Meyer[3], Mr. B Chisanga[4] and Prof TS Jayne[5]

[1]Reasearch Analyst and [3]Director: Bureau for Food and Agricultural Policy
Department of Agricultural Economics, Extension and Rural Development
Faculty of Natural and Agricultural Sciences
University of Pretoria

[2]Tegemeo institute of Agricultural Policy and Development, Egerton University

[4]Research Associate – Indaba Agricultural Policy Research Institute

[5]Professor – Michigan State University

[1]tracy.davids@up.ac.za / tracy@bfap.co.za   [2]Gitau@tegemeo.org
[3]ferdi.meyer@up.ac.za   [4]brian.chisanga@iapri.org.zm
[5]Jayne@anr.msu.edu

EVALUATING PRICE VOLATILITY AND THE ROLE OF TRADE IN EASTERN AND SOUTHERN AFRICAN MAIZE MARKETS

ABSTRACT

Food price volatility, particularly in key food staple markets, has been a long standing challenge in Sub-Saharan Africa, where prices are already some of the highest in the world. In many cases, governments have acted to curb volatility, though several researchers have shown that actions aimed at reducing volatility in the short run have often been counterproductive for long term aims of market led productivity growth that would be able to reduce high prices in the region. With increased intra-regional trade having been proposed as a solution to volatile prices in the region, this study finds that across a sample of 36 maize markets in Eastern and Southern Africa between 2008 and 2014, volatility is significantly lower in markets with higher trade volumes. Thus it postulates that policies aimed at increasing the efficiency and reducing the cost of intra-regional trade will be efficient in curbing volatility in the region, thus improving food security.

1. INTRODUCTION

Food price volatility has long been a recurring issue in many African countries and particularly in relation to food staple markets, it has been an important factor affecting food security. Comparing food price volatility in international markets to a sample of Eastern and Southern African (ESA) countries, Minot (2014) demonstrates that food price volatility in the region is more than double that evident in international markets over the same period. Considering that poor households spend a greater share of total expenditure on food and that the share of the population that depend on agriculture for its livelihood is generally larger in SSA relative to the rest of the world, this presents an important source of risk for the region.

In ESA, maize is the primary staple crop; it provides the foremost source of calories in the average diet accounting for approximately 25% of total caloric intake between 2013 and 2015 (OECD-FAO, 2016). Maize accounted for more than 35% and 50% of total cultivated area in Eastern and Southern Africa respectively between 2013 and 2015 (OECD-FAO, 2016) and is grown by multitudes of smallholder producers across the region, who rely on it for food and income. Given its undisputed importance, maize has become synonymous with food security in the region and consequently has also been prioritised on the political front. The perceived need to stabilise prices and supply, thus ensuring food security, has been offered as

justification for continued government intervention, despite the international drive towards liberalisation (Jayne and Tschirley 2009, Minot 2014).

Governments are often faced with the need to balance short term food security objectives with longer term goals of increased, market led productivity growth and in many instances appear to lack the confidence to rely on market and trade based approaches to ensure that food security goals are met (Chapoto and Sitko, 2014). Thus interventions have been forthcoming, however, such interventions have been highly discretionary and unpredictable, often characterised by the sudden implementation of trade controls, unanticipated changes to tariff policy and inconsistent pricing policies for government purchases. Consequently several researchers have questioned the success of such policies and contrary to stabilisation objectives, observed volatility over the past decade has been higher in markets where governments intervene most actively (Chapoto and Jayne 2009, Jayne 2012, Minot 2014).

Policies designed to reduce volatility are important in improving food security, owing to its impact on affordability, yet as Minot (2014) notes, the absolute levels of food prices are equally important. With few exceptions, maize prices in ESA remain high in the global context, with significant differences between surplus and deficit markets. This study therefore evaluates relative price levels and volatility across the ESA region, as well as the factors influencing them. Given the limited success of price stabilisation efforts noted by Minot (2014), it considers the role of trade in reducing price volatility. The paper is organised as follows: After this introduction, it considers key drivers of price volatility, followed by an assessment of both price levels and volatility across the nine countries included in the Regional Network of Agricultural Policy Research Institutes[1] (ReNAPRI). An evaluation of processing margins between wholesale maize prices and retail maize meal prices follows, before drawing conclusions and summarising key findings.

2. FACTORS INFLUENCING PRICE VOLATILITY IN EASTERN AND SOUTHERN AFRICA

Following the global food crisis in 2007/08, increasing attention has been focused on the extent to which the sharp increase in global price levels, as well as the heightened volatility evident in global markets was transmitted into the developing world. Africa in particular has been the subject of numerous studies and while results indicate that prices in the region did rise significantly over the same period, spatial analysis indicates that within the maize sector, integration with world markets remains weak, with domestic supply and demand shocks responsible for most of the volatility in the region (Minot 2011, Baquedano and Liefert 2014, Baffes *et al.* 2015). The predominance of rain-fed agriculture supports this notion, as climatic conditions influence the consistency of production levels. Combined with typically low price

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[1] Countries include Democratic Republic of the Congo, Kenya, Malawi, Mozambique, South Africa, Tanzania, Uganda, Zambia and Zimbabwe.

elasticities in food staple markets, such variation in production levels is arguably an important driver of price volatility.

The role of stock levels in influencing volatility has also been acknowledged. In many ESA countries, stock levels are limited by infrastructural constraints and often the majority of stocks are held as strategic food reserves by government. The establishment of such food reserve programs was a resolution within the Maputo declaration on agriculture food security. Across ESA, strategic food reserves have been employed in Kenya, Zambia, Malawi and Zimbabwe. While the maintenance of such reserves is justifiable, design in line with the specific objectives of the policy, as well as transparent implementation and pricing is key to achieving success and limiting market distorting impacts. When prices are not transparent and market based, they can also lead to speculation. For example in Kenya the National Cereal and Produce Board (NCPB) buys maize for strategic reserves, with the added objective of stabilising prices. NCPB policy indicates that prices are based on the market price, yet over the years, producers have always exerted pressure through withholding stocks and lobbied government to increase the price offered by NCPB. When prices are increased, this drives the market price higher. During the periods when NCPB was not participating in the market, prices have been more stable.

Government actions aimed at curbing price volatility have differed across the region, allowing conclusions related to their success based on volatility levels post 2008. An extensive discussion on policy responses of several developing countries to the price volatility crisis is presented by Bryan (2015). Overall, most governments focussed on consumer and trade issues at the expense of increased production, with 50% more policy responses focused on consumers and trade through lower import tariffs and food taxes, rather than output. Particularly in the group of countries that intervened most actively, export bans were also frequently employed. Such actions inhibit efficient trade with the rest of the region however, which can impact on prices in neighbouring countries. Such actions also further diminish confidence in market and trade related responses to changes in prices and further emphasise the often perceived need for self-sufficiency.

The role of intra-regional trade in reducing volatility and improving food security was recognised in the Malabo Declaration on accelerated agricultural growth, which committed to boosting intra-African trade in agricultural commodities and services. A reduction in barriers to regional trade offers an inexpensive means of reducing domestic price volatility (Dorosch et al., 2010) and the World Bank (2012) indicates that an enabling environment which allows intra-regional trade to occur more efficiently has enormous potential to improve food security in the region. This positive contribution is already evident in regions where cross border trade is prevalent (Mozambique-Malawi, Malawi-Zambia, Uganda-Kenya), with neighbouring countries essentially pooling production in order to stabilise markets (Chapoto and Sitko, 2014).

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3. REGIONAL COMPARISON OF PRICE LEVELS AND VOLATILITY

Consideration of historic trade-flow within the region supports the notion that domestic supply and demand fluctuations have a greater influence on price volatility than international price movements. White maize accounts for the majority of maize consumption within ESA, whilst yellow maize dominates in the global market. Maize markets in the region remain insulated from world markets by high transportation costs, while policies that reflect the reluctance to accept maize with genetically modified technology further limits potential import sources from outside of the region. Consequently, the majority of trade occurs intra-regionally and maize imports from outside the region have been limited, except for yellow maize imports into South Africa for the feed market (Figure 1).
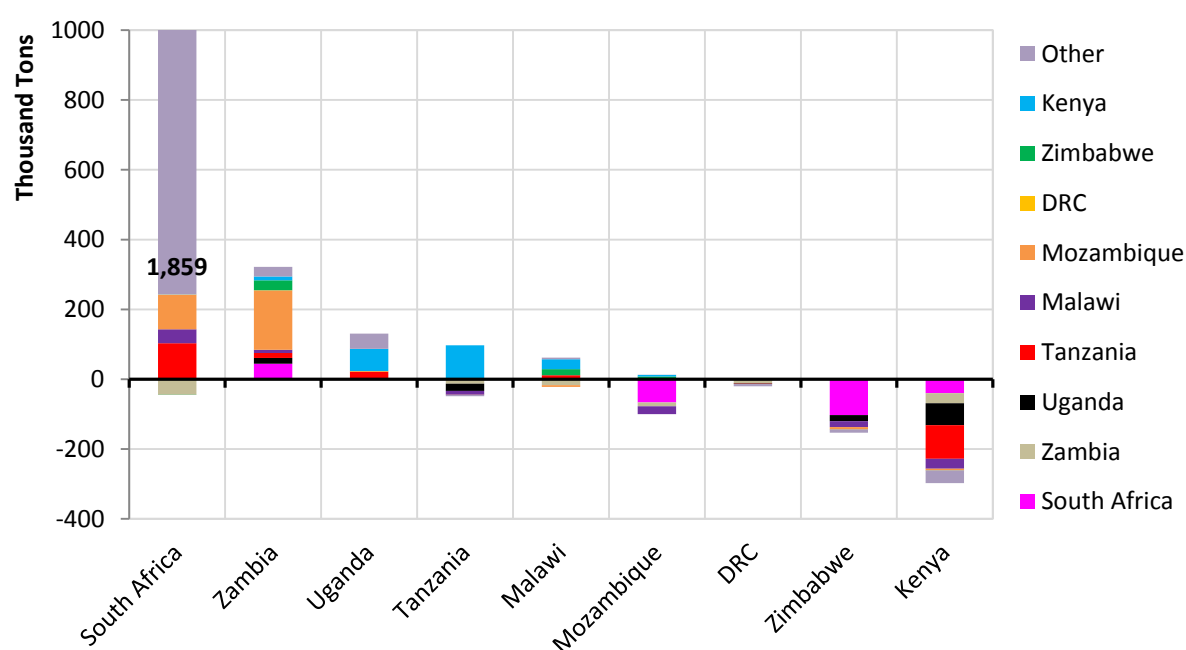
Figure 1: Average net exports between 2010 and 2014, disaggregated by trading partner

Source: ITC Comtrade (2015) and FEWSNET (2015)

Figure 2 presents the typical trade-flows of the nine countries included in the ReNAPRI network from 2012-2014. Since 2008, South Africa, Zambia and Uganda have supplied consistent exports into the region, whilst Kenya, Zimbabwe, DRC and Mozambique have remained in deficit. Mozambique presents a very regional market however; the Southern region is typically in deficit and has in the past mainly relied on imports from South Africa whereas the Northern regions often produce a surplus, yet high transport costs inhibit maize shipments from the Northern surplus regions to the deficit markets in the South (Tostao & Brorsen, 2005), resulting in a negative net trade position at national level. Tanzania and Malawi have traded closer to self-sufficiency, switching between net imports and net exports based on weather conditions. The most important shift that has taken place in terms of trade

flow is Zambia becoming a surplus producer over the past decade and replacing much of South African white maize exports to Zimbabwe.
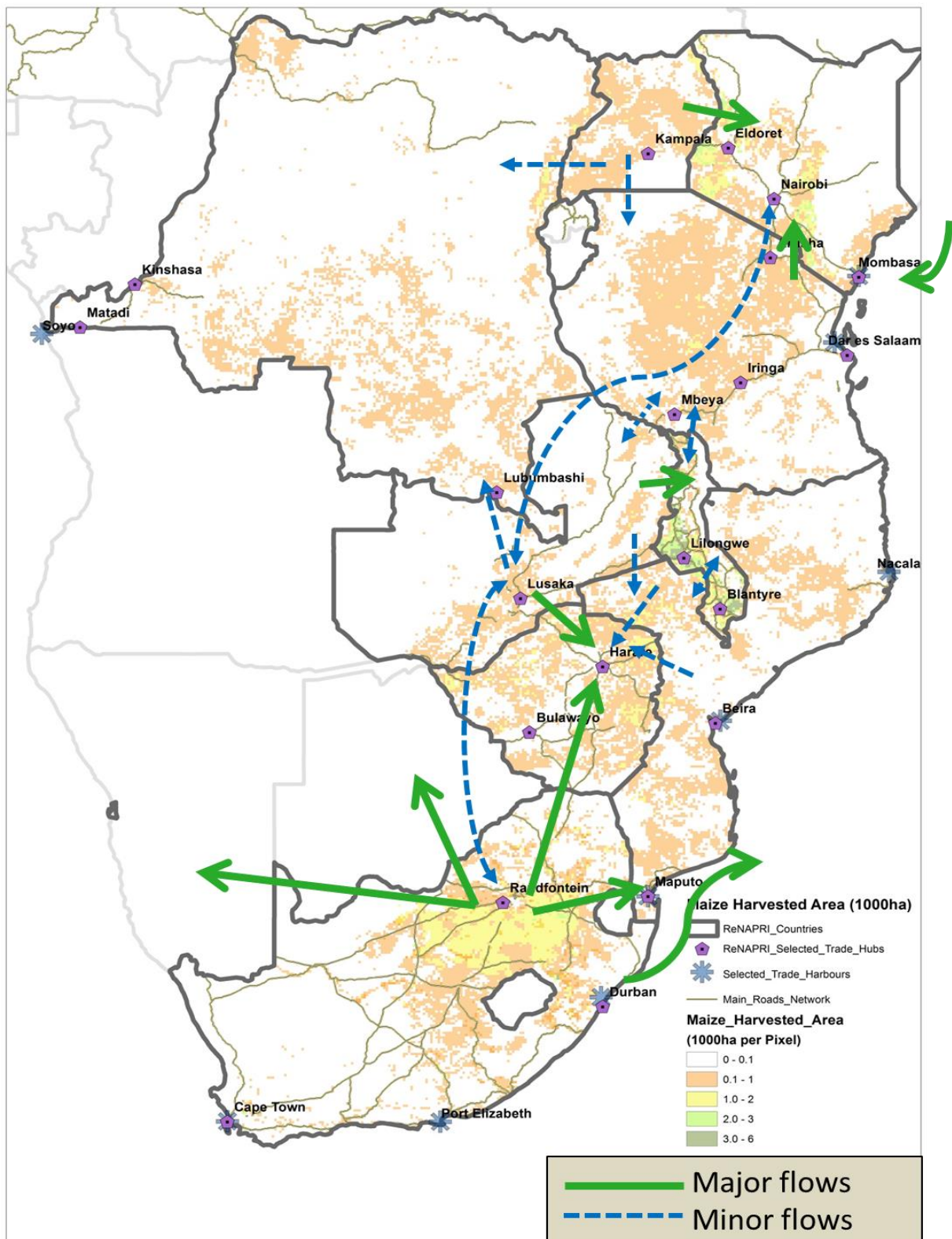

Figure 2: Maize area planted and major and minor trade flow patterns in the ESA region (Avg 2012-2014)

Source: ITC (2015), FEWSNET (2015) and GAEZ (2015)

Relative price levels within the region reflect the trade patterns that are evident, as well as the substantial cost of transportation. Figure 3 illustrates the relative prices, as well as volatility levels in several key markets across Eastern and Southern Africa. Prices are measured at wholesale level and represent the average price through the 6 months after harvest (harvest average) and the rest of the year (lean average) between 2008 and 2014. As would be expected, prices in deficit regions are consistently higher than those in surplus producing regions, with Maputo, Nairobi and Harare amongst the highest prices in the region. Conversely, consistent surplus producers such as South Africa and Zambia are amongst the lowest in the region.
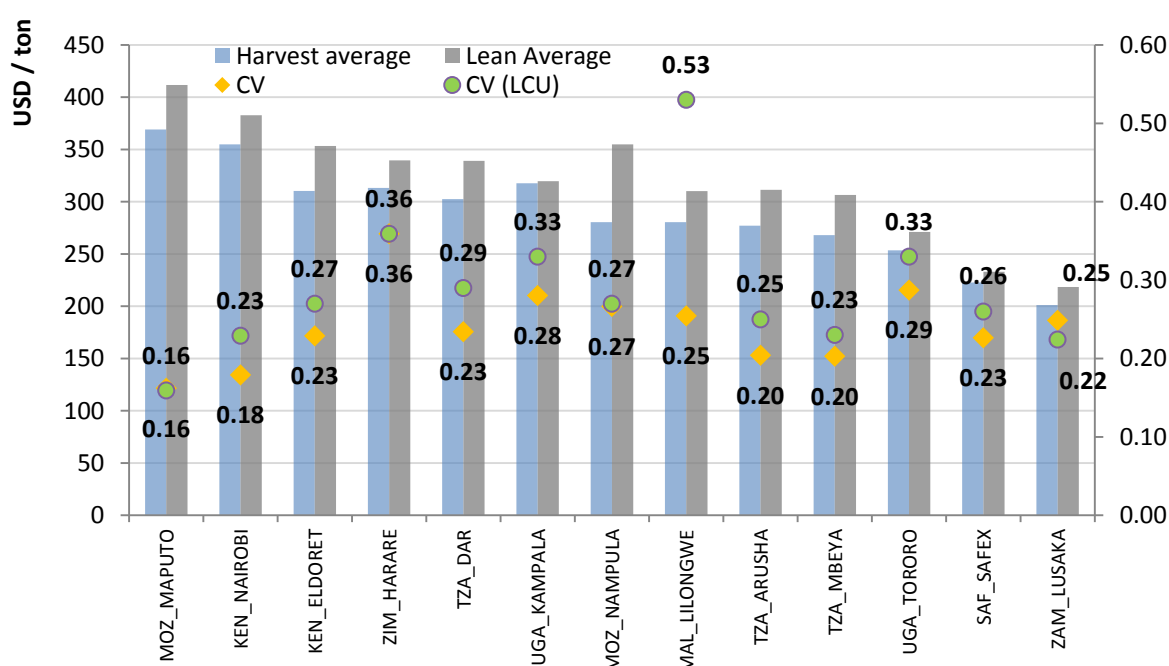
Figure 3: Relative price levels (wholesale) and volatility across Eastern and Southern Africa
Source: FEWSNET (2015) and FAO GIEWS (2015)

As the largest city and major commercial centre in East Africa, Nairobi is an important driver in the market. Kenya remains the largest single importer in the region and while high prices reflect the cost of transporting maize from surplus regions, the expanding market in Nairobi is demonstrating a growing influence on prices in Tanzania and Uganda, where most of its imports originate from. Uganda is favourably located to deliver maize into Kenya's main production region in the Rift Valley, while transport rates into Nairobi and Mombasa are often reduced due to a lack of backloads when imported goods are transported inland from the coastal region. Its proximity to Nairobi also allows for surpluses from Northern Tanzania to be transported at competitive rates from Arusha, which remains an important transport hub in Tanzania. The evolution of demand patterns and production growth in Kenya over the next decade will impact not only on prices in Kenya, but also on market prices in Uganda and Tanzania.

Tanzania itself is a complex market; it covers a large geographical area, characterised by 5 distinct geographic and agro ecological zones, with self-sufficiency across different regions reflecting a large degree of variation. Whilst surplus markets in the North such as Moshi and Arusha supply into the growing market in Nairobi, the surplus markets in the South remain fairly isolated from large consumption centres such as Dar Es Salaam and Dodoma in the central deficit region due to large distances and high transportation costs. Hence cross border trade into Northern Mozambique and Malawi provide additional markets for surplus products (Baffes *et al.* 2015).

Malawi represents a complex market, with limited information related to production volumes and informal cross border trade-flows. Despite its smaller size, prices across the country show a great deal of variation; markets remain thin, with estimates by the Grain Traders and Processors association indicating that only about 10% of total maize production is traded formally (Edelman and Pauw 2015). Due to its proximity to various surplus regions, imports accrue from various sources - historically imports have been prevalent from Northern Mozambique, Tanzania and Zambia, however in different years, exports have also flowed to Mozambique, Tanzania and Zimbabwe. Whilst mostly operating in an autarkic situation, its proximity to relatively reliable surpluses from Zambia and Northern Mozambique results in prices tending to follow those markets in years of deficit. Figure 3 indicates that prices in Lilongwe are some of the most volatile in the region, consistent with the findings of Chapoto and Jayne (2009).

Within the Southern African region, Zimbabwe remains the largest importer, due to rising consumption and limited growth in production. While South Africa represents the traditional source of imports into Zimbabwe, competition from Zambian maize has been fierce in recent years due to more favourable transportation costs and the GM free status of Zambian maize (Figure 4). The source of imports often shifts as relative prices change however and consequently the level of price transmission between these markets is inconsistent based on changes in trade volumes. Consistent surplus production from Zambia, favourable transport differentials relative to South Africa and reduced prevalence of export restrictions could result in Zambia providing the bulk of Zimbabwean imports in the future, resulting in a stronger link between these markets.
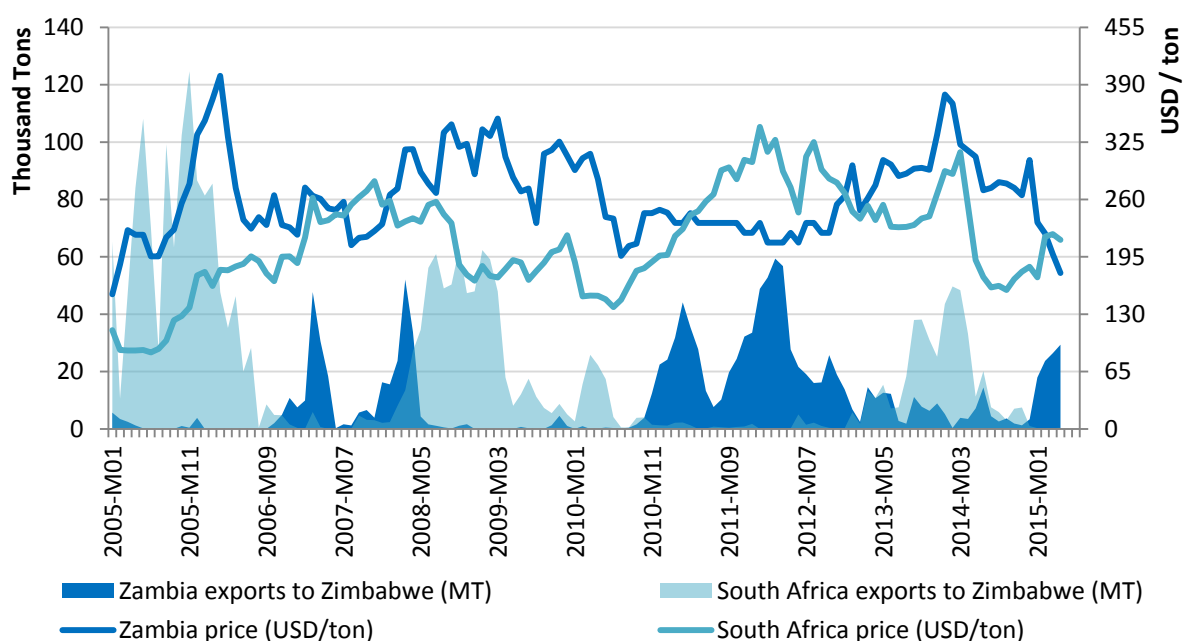
Figure 4: Zimbabwe maize imports and relative prices in South Africa and Zambia

Source: ITC Trademap and FEWSNET, 2015

South Africa also remains a consistent supplier of surplus white maize into Maputo and the price in Maputo is derived from the import parity price ex South Africa plus a Value Added Tax (VAT) levied on imported maize. During periods of high import volumes, maize prices in Mozambique have been proven to exhibit co-integration with South African prices (Traub *et al.* 2010) and as South Africa remains the most affordable source of imports into Maputo in most of the seasons, market movements in South Africa will continue to affect prices in Maputo. At the same time, declining export volumes into Zimbabwe and continued expansion in the demand for animal feed is projected to accelerate the trend of rising yellow maize production in South Africa, reducing the exportable surplus of white maize into the African region. Zambian surpluses are expected to become more consistent however and as a growing supplier of non GM white maize to a number of countries, its competition with South African maize, as well as its influence on regional prices will intensify over the course of the next decade.

Whilst relative price levels are undoubtedly important, volatility is an important consideration from a risk perspective, particularly in Sub-Saharan Africa where households allocate a large share of budgetary expenditure to food products and a substantial share of the population depend on agriculture for its livelihood (Minot 2014). The issue of food price volatility has received unprecedented attention in recent years and it has been measured in various different ways. A popular and relatively simple measure is the coefficient of variation (CV), defined as:

$$CV = \frac{s}{\mu}$$

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Where s is the standard deviation over a specified period and μ is the mean value over that same period. Expressing the standard deviation relative to the mean allows for the comparison of variation between series that differ in scale and while the CV is time-dependant it remains an appropriate measure of relative volatility in different series over the same time period.

As a relative comparison between the volatility evident in the different markets, Figure 8 illustrates the average price levels in selected maize markets across Eastern and Southern Africa in the 6 months following the harvest (harvest period), as well as the remaining six months (lean period) for the period between January 2008 and October 2014. The CV calculated in both domestic currency and US dollar terms is also included. Whilst Figure 3 only presents the main markets, evaluation of the full sample of 36 markets suggests that the seasonality experienced in East African markets that are able to harvest for a second time within each 12 month period is reduced. The difference between harvest period and lean period prices in the East African markets amounted to 8% on average across the sample, whilst the same difference in the Southern African markets averaged 12%. This also results in a marginally higher coefficient of variation (US dollar terms) in the Southern African Markets (27%) relative to the East African markets (24%).

Figure 3 suggests a significant increase in volatility when considered in domestic currency terms relative to US dollar terms, implying that macro-economic volatility is a significant contributing factor to the volatility experienced in these markets. Considered in US dollar terms to account for currency fluctuations, the observed volatility over the period under examination was the highest in Harare and Kampala, whilst it was the lowest in Maputo, Nairobi, Mbeya and Arusha. Three of these low volatility markets have the benefit of multiple harvests in any calendar year, however it remains a diverse grouping in terms of classification as surplus or deficit regions, as well as distance to other surplus or deficit regions. Maputo and Nairobi are both deficit regions, Maputo being a coastal city with a port, but Nairobi almost 500 km away from the closest port in Mombasa. There is however a good road network between the two cities. Mbeya and Arusha on the other hand are surplus producers in the South and North of Tanzania respectively. Arusha is favourably located to supply maize into Nairobi, whereas Mbeya is a relatively isolated market (Baffes *et al.* 2015). Maputo typically imports from South Africa, which benefits from a transparent price formation mechanism on the commodity exchange market. Many reasons have been offered in literature as a reason for volatility in the region; Minimal volatility in Mozambique is supported by the findings of Chapoto and Jayne (2009), who attributed this fact to Mozambique's relatively open trade and marketing strategy and concluded that markets typically characterised by increased government intervention tend to be more volatile. Minot (2014) also suggested that within maize markets, volatility was greater in landlocked countries relative to coastal regions, although this finding was unique to maize markets, with most other commodities exhibiting less volatility in landlocked countries.

Minot's findings suggest that improved access to international markets reduces volatility, however it fails to account for the fact that the greatest share of maize traded originates from

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within the region as opposed to international sources and access to ports may therefore not be the primary determinant of the impact that efficient trade-flow has in reducing market volatility. In order to test for the impact of port access, a simple bivariate regression analysis was conducted to relate market volatility, as measured by the CV to distance to closest port. The analysis included a cross sectional sample of 36 markets across Eastern and Southern Africa with summary statistics presented in Table 1.

Table 1: Summary statistics of prices included in the volatility analysis

	Mean	Min	Median	Max	StDev	CV
KENYA_ELDORET	332.35	164.11	345.98	528.12	75.70	22.78
KENYA_KISUMU	401.81	211.91	408.57	600.00	89.65	22.31
KENYA_MOMBASA	347.29	172.05	358.26	503.75	67.62	19.47
KENYA_NAIROBI	369.18	219.91	385.78	528.12	66.25	17.94
MALAWI_KARANGWA	295.94	149.10	284.33	477.84	85.43	28.87
MALAWI_LILONGWE	295.32	193.26	286.55	478.36	75.81	25.67
MALAWI_LUNZU	289.25	170.03	262.34	581.38	98.16	33.94
MALAWI_MCHINJI	257.55	23.87	235.49	465.70	95.56	37.10
MALAWI_MITUNDU	291.47	148.06	260.97	564.56	95.35	32.71
MALAWI_MZUZU	278.60	171.68	256.64	454.83	76.87	27.59
MALAWI_NSANJE	309.23	158.52	285.43	657.36	94.84	30.67
MOZAMBIQUE_MANICA	317.58	175.53	298.64	671.75	97.40	30.67
MOZAMBIQUE_MAPUTO	391.59	290.00	375.00	560.00	63.45	16.20
MOZAMBIQUE_NAMPULA	281.08	160.00	260.00	490.00	83.84	29.83
MOZAMBIQUE_TETE	322.67	207.07	298.91	642.91	93.27	28.91
TANZANIA_ARUSHA	294.23	166.60	295.82	442.26	60.33	20.50
TANZANIA_DAR	320.81	186.15	312.11	559.04	75.57	23.56
TANZANIA_DODOMA	324.24	207.71	309.95	558.00	77.53	23.91
TANZANIA_MBEYA	287.26	186.15	286.31	471.42	58.27	20.28
TANZANIA_SONGEA	213.98	119.87	207.06	387.00	58.78	27.47
UGANDA_ARUA	292.71	118.45	300.80	506.03	85.14	29.09
UGANDA_KAMPALA	318.64	127.35	333.42	563.96	90.01	28.25
UGANDA_MASINDI	239.46	84.60	238.49	496.10	72.54	30.30
UGANDA_TORORO	262.54	106.20	268.18	492.00	75.78	28.86
SOUTH AFRICA: RANDFONTEIN_WHITE	227.86	137.97	232.20	342.26	51.85	22.76
SOUTH AFRICA: RANDFONTEIN_YELLOW	227.04	144.52	232.92	345.52	51.93	22.87
ZAMBIA_CHIPATA	237.96	166.60	230.31	322.19	37.94	15.94
ZAMBIA_CHOMA	212.77	116.67	200.05	322.19	51.67	24.28
ZAMBIA_KABWE	224.18	116.67	214.13	469.80	55.80	24.89
ZAMBIA_KASAMA	271.83	175.93	258.40	403.95	58.49	21.52
ZAMBIA_KITWE	273.77	177.78	268.81	384.93	51.00	18.63
ZAMBIA_LUSAKA	209.74	108.20	198.10	381.36	52.15	24.86
ZAMBIA_MANSA	262.59	161.85	249.91	420.00	60.17	22.92
ZAMBIA_MONGU	327.93	202.67	299.39	779.18	102.51	31.26
ZAMBIA_SOLWESI	264.40	158.33	265.42	390.64	64.82	24.52
ZIMBABWE_HARARE	326.45	140.00	290.00	860.00	116.78	35.77

The bivariate analysis did not provide any statistical significance for the distance to port variable (Table 2), suggesting that there is no clear relationship between volatility and distance to port. Thus the isolation from world markets arising from the land-locked nature of

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many markets in the region may not be the primary determinant of volatility in these markets. This finding is in fact confirmed by previous studies which suggested that the heightened volatility evident within the African region is attributed to domestic supply shocks and policy responses, as opposed to world market volatility (Minot, 2014). The high cost of transportation associated with the region provides a natural insulation from world markets whilst, the preference for non-GM, white maize limits the surplus markets for potential imports from outside the region. Despite the protection offered by these factors during periods of global instability, the comparatively high cost of transportation within the region increases the cost of imported products during periods of domestic shortage, often exacerbating the price impact of domestic supply shocks.

Given the predominance of intra-regional trade, the findings related to the regression using distance to port as an explanatory variable for volatility are not unexpected, but also are not sufficient to suggest that trade does not influence volatility. Consequently a second bivariate regression analysis was conducted with the coefficient of variation as dependant variable and total trade volume (imports + exports) as explanatory variable. The results presented in Table 2 suggest that the total trade volume is a statistically significant explanatory variable for volatility at 10%, implying that trade can be effective in reducing price volatility. This is an important finding from a policy perspective, as it suggests that liberalised trade regimes will be effective in reducing volatility levels.

**Table 2: Results of the regression analysis**

Dependant Variable	Independent Variable	T-Statistic (P-value)	F-Statistic (P-value)
Coefficient of Variation	Distance to closest port	1.02 (0.31)	1.04 (0.31)
Coefficient of Variation	Total trade volume	-1.86 (0.07)*	3.45 (0.07)*

*Significant at 10%

Whilst higher in maize markets, intra-regional trade still accounts for less than 10% of total trade in food staples, suggesting that its contribution to reducing volatility could be far greater (Morrison and Sarris, 2015). Informal charges to trade, political borders and limited transportation infrastructure have all been identified as important reasons for unexploited regional trade potential (Haggblade, 2013). The World Bank (2012) notes that high transportation rates related to the lack of investment in modern trucking and shipping capacity remains a key limitation to efficient cross border trade. Different studies have estimated that a 50% reduction in transportation rates in Mozambique could increase real agricultural GDP by 7%, whilst reform that delivers more competition could reduce the cost of transporting staples in West Africa by 50%. Incentives for such investment remain weak however due to a lack of information, inefficient border crossings and a lack of transparency related to discretionary trade policies (World Bank, 2012).

4. RELATIVE MARKETING MARGIN COMPARISON: MAIZE TO MAIZE MEAL

From a consumer's perspective, prices are measured at retail as opposed to wholesale level and hence the efficiency of the value chain in converting primary commodities such as maize grain to maize meal is an important attribute in considering the affordability of food products. Consequently, evaluations of relative price levels remain incomplete when the margin to retail level is not considered. The challenge of making any form of analysis of retail prices of maize meal within the region and markets is to ensure that the products are comparable. Apart from the extraction rate that is the most important indicator of the type of maize meal, the type of fortification that is required in countries like South Africa also plays an important role.
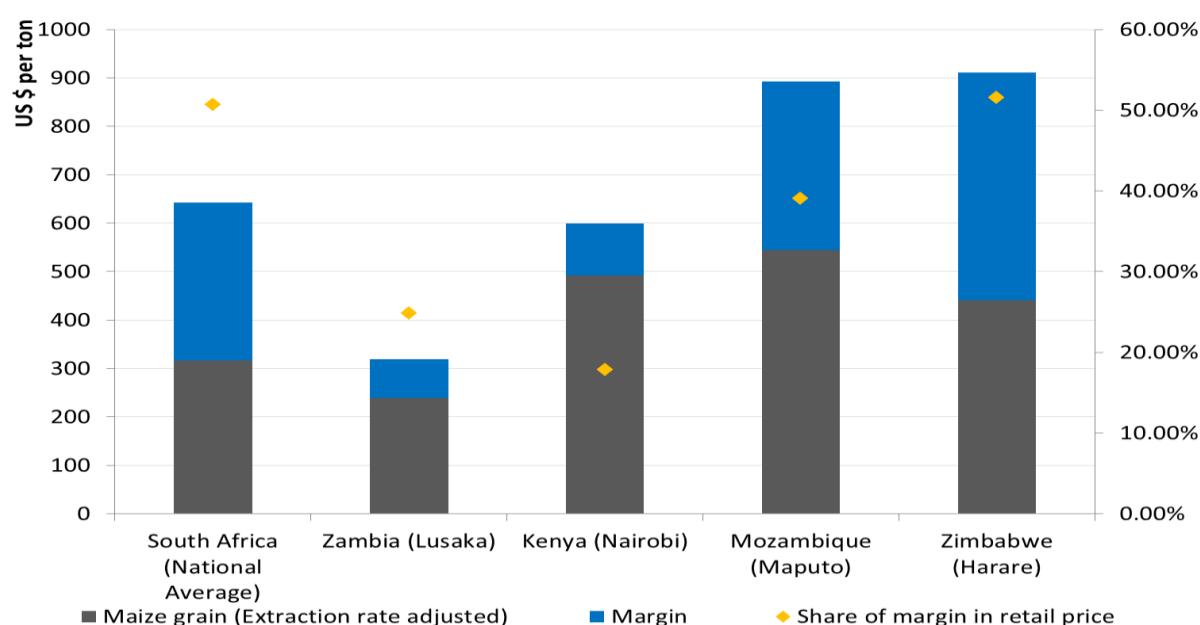
*Details on retail prices provided in Table 3

Figure 5: Regional comparison of maize to maize meal margins, average 2008-2014

Source: FEWSNET, 2015

Figure 5 presents a comparison of maize meal prices in selected markets across South Africa, Zambia, Kenya, Mozambique and Zimbabwe. Maize grain costs were adjusted for the relevant extraction rate in each country, in order to illustrate the share of the margin in the final retail price of maize meal in each market (on the right axis). Prices presented are an average from January 2008 to October 2014, with the location, source, type of maize meal and relevant extraction rates specified in Table 3. The highest margins are observed in South Africa and Zimbabwe, where maize constitutes less than 50% of the retail price of maize meal. Maize meal prices in Zambia are significantly cheaper than any of the other countries; maize grain was the cheapest of the 5 countries over the stated period and the extraction rate is also the highest. Furthermore, the FRA has made subsidised maize grain available to

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millers in the past in order to maintain maize meal prices at acceptable levels. Interestingly, despite significantly higher maize grain prices, maize meal prices in Kenya are below South African levels. Kenyan extraction rates are marginally higher and South African maize is fortified, but at less than 20%, the share of the margin in total maize meal cost is significantly below South Africa, Zimbabwe and Mozambique. Kaves (2014) indicated that in 2014, the cost of maize grain represented 85% of maize meal costs, supporting the estimated value of 82% on average from 2008 to 2014.

Table 3: Maize meal price data detailed

	Source	Location and Type	Extraction Rate
South Africa	Stats SA	National Average, Urban areas, Special, 2.5kg packaging	72.00%
Zambia	FEWSNET	Lusaka, Roller meal	87.50%
Kenya	FEWSNET	Nairobi	75.00%
Mozambique	FEWSNET	Maputo	72.00%
Zimbabwe	FEWSNET	Harare	72.00%

5. CONCLUSIONS

In light of the undisputed importance of maize in considering food security in Eastern and Southern Africa, this paper provides a comprehensive assessment of maize price levels, as well as volatility across none countries in Eastern and Southern Africa. Food price volatility has been a long standing challenge in the region and represents an important source of risk to producers and consumers alike.

In one of the most food insecure regions in the world, governments are often faced with the challenge of balancing short term food security objectives with longer term goals of market led productivity growth. Hence they often act with the objective of reducing volatility, yet the discretionary nature of such interventions has led to their efficiency in reducing volatility being questioned. Instead, the role of intra-regional trade has been recognised by international institutions such as the World Bank and the African Union as having immense potential in reducing volatility.

A comprehensive evaluation of price levels and volatility across 36 markets in Eastern and Southern Africa highlights the complex market linkages found in the region, in line with intra-regional trade. The volatility analysis finds no significant link between the coefficient of variation as measure of volatility and the distance to closest port. It does however find a statistically significant negative relationship between total trade volumes and volatility, implying that countries that have created an environment for efficient trade have been more successful in reducing volatility than those that have not.

From a policy perspective, the finding that trade volumes have a statistically significant impact on volatility in the region is important, as it indicates that the promotion of increased intra-regional trade as a means of reducing volatility should be continued. With traditional

food stabilisation efforts having been shown to be counterproductive, policies aimed at improving the efficiency of intra-regional trade are key to overcoming the long standing problem of volatility in the region.

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