

## Assessing the readiness of Zimbabwe in adoption of an agricultural commodity and derivatives market- a review paper

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### Abstract

*With the increased fragmentation of the Zimbabwean agricultural system it has become apparent for stakeholders to look for new ways to managing market risk to enhance farm profits. Globalisation has also increased the pressure for regional and global integration hence the possibility of a commodities and derivative exchange has been under serious consideration by the Government and stakeholders. This review has shown that while financing the exchange is central to its implementation, more studies need to be done to assess, the level of interest by farmers, infrastructural, the logistical, warehousing, capacity building and legal parameters. A specific study on viability of the exchange is also required. The review has also shown that the success of such an exchange in sub-Saharan Africa, with the exception of SAFEX is limited due to the main issues of volumes of trade and strong government interventions in the market.*

**Key word:** *Agricultural commodities, Derivatives, Agricultural markets, Zimbabwe*

### Introduction

In January 2010 the government announced through the Ministry of Industry and Commerce the launch of a commodities exchange in Zimbabwe, Commodities Exchange of Zimbabwe (COMEZ) was received with lots of enthusiasm by stakeholders as it was believed to unlock value in the marketing of agricultural produce. A commodity exchange is believed to operate on the principles of demand and supply hence it becomes a transparent price determination mechanism. In

addition the free flow of market information will ensure fairness in trading system. The exchange is believed to act as both a spot and futures market for trade of agricultural commodities and will allow integration with other regional and global markets. Three years after the launch (2013) the exchange is yet to begin trading, and this give rise to the question of whether Zimbabwe is ready ( infrastructure, legal, capital, capacity) to operate such an exchange. In May 2013 the government availed USD 500 thousand of the USD 1 million to kick start the venture. *What exactly is required to operate a viable commodities exchange?* Noteworthy, Zimbabwe operated a similar exchange (ZIMACE) between 1994 and 2001 that traded all agricultural products except milk. This was after the adoption of the Agricultural Sector Policy and Pricing workshop of November 1992 recommendations that followed through market liberalization policies under the Economic Structural Adjustment Program. However this exchange was short-lived due to the promulgation of statutory instrument 235A of 2001 that legislated Grain marketing Board) GMB to be the sole purchaser of controlled products, maize and wheat leading to the collapse of ZIMACE in 2001. What lessons can be learnt from this? Radical policy shifts/government intervention in

markets will result in traders taking positions to minimize net welfare losses. In this case a proliferation of the parallel market for grains resulted. Without a formal way of price determination farmers received an unfair price and the middlemen increased margins resulting in agricultural production suffering. Albeit other factors, contribution of agriculture from 19% in 1999 to less than 16% in 2002.

Marketing of agricultural commodities have been loosely organized in Zimbabwe. The policy environment has also been unstable to the marketing of agricultural commodities for farmers in general and smallholder farmers in particular. While formal institutions have been established with the aid of the Government (GMB, DMB, COTTCO, CSC, TMB, NRB, ARDA etc) Rukuni (2006), farmers are left in limbo as to the best market driven place for the exchange of commodities. Over the years these institutions have been transformed through privatization and commercialization with the objective of making them more viable. However, these transformations have not had effects on the entire value chain with especially farmers being negatively impacted. Contract farming has been offered as a solution with companies like Interfresh, Matanuska, Cains,

GMB, Oil seed companies all attempting to contract farmers notwithstanding challenges especially of side marketing. As a result the farmers are possibly not realizing the best possible income. In addition the growth of the financial services sector has not fully supported the farmer's right though the value chain with many financial institutions offering production support facilities as opposed to trade facilities.

While some work has been done and is still being done in input financing schemes, hire purchase and capital and working capital loans, trade finance, the market place for commodities is underdeveloped. As a result opportunities for farmers and other agribusiness to mitigate market risk have not been provided or initiated by the government with the private sector less interested. The Zimbabwe Stock exchange is notably the only registered exchange that trades in financial instruments. A commodities market that fixes prices on the basis of demand and supply and therefore has the potential to reduce arbitrage, and will minimize the interference by governments in markets( if this is viewed as detrimental).

### **Poor development of commodity exchanges**

Various reasons can be attributed to the poor development of agricultural

commodity exchanges in Southern Africa and Zimbabwe in particular. Most people have the impression that commodity markets are very complex and difficult to understand (Lerner, 2000). Secondly there has been difficulty in justifying the relevance of a futures exchange as opposed to a general market. Thirdly with the exception of South Africa there has been lack of financial depth and innovation within the financial services sector, with most institutions preferring traditional banking roles. The challenge is however the increased levels of globalization that has resulted in easy access to information and global markets and products. Globalization has also resulted in the shared or similar cost structures such as fuel, labour and chemicals. Globalization has also evened out the risk profiles of agribusinesses such that all agribusiness face the same global concerns like, global inflation, recession, energy crisis and geopolitical issues. Global events such as the wheat fires on Russia in 2009, floods in the USA in 2008 had immediate impact on the prices of such commodities as wheat and wheat products to even southern African countries. The impact of world credit crisis on commodity market has been the induction of panic selling or buying, resulting in the prices of most of the commodities

falling. Owing to the slowdown in global economy, the demand for commodities is also affected and lastly global recession has an effect on the liquidity of local markets which ultimately affects the local farmer in Zimbabwe.

Negotiations in the Doha development round have demonstrated the commitment by the international community for a multilateral trading system that can generate opportunities and welfare gains for contemporary developing countries through a process of reform and liberalization of trade policies. This as well will affect the exchange of commodities in Africa and Zimbabwe in particular.

### **Pricing of agricultural commodities**

Several factors affected the price determination of agricultural commodities with demand and supply being the main determinant. Government policy on strategic crops, pricing and export promotion also affect the ultimate price paid to the farmer. However, economics literature generally agrees with few exceptions that when government intervenes there are high possibilities of market inefficiencies evident in side marketing, low/over production, poor quality and creation

of parallel/illegal markets. The African Development Bank, 2011 annual report alludes that State controlled institutions have monopoly on imports of key agricultural commodities thus offering some fixed price to producers and selling at international prices hence keeping their downward risk at a minimal. In Zimbabwe however, these institutions have a monopoly of even imports and exports. The ratio of stocks to demand play a role in determining the price level because of the general perishability of most agricultural products. In addition food reserves and buffer stocks and trade policy have to be clearly articulated as they have an impact on commodity markets. As a result most companies in Zimbabwe are interested in hedging against currency risk as opposed to commodity risk (Cottco, 2008). Ghana has been noted as the exception in adopting a commodity price risk management through the establishment of a derivatives market.

To ensure that agricultural commodities are priced fairly many developed and fast developing countries have introduced commodity exchanges in the options and futures exchanges. The exchanges run on the same principles as organized exchanges in minerals, stocks, foreign currency e.t.c. A well-

developed and effective commodity futures market, unlike physical market, facilitates offsetting the transactions without impacting on physical goods until the expiry of a contract. Futures market attracts hedgers who minimize their risks, and encourages competition from other traders who possess market information and price judgment. While hedgers have long-term perspective of the market, the traders, or arbitrageurs as they are often called, hold an immediate view of the market.

A large number of different market players participate in buying and selling activities in the market based on diverse domestic and global information, such as price, demand and supply, climatic conditions and other market related information. All these factors put together result in efficient *price discovery* as a result of large number of buyers and sellers transacting in the futures market. Therefore price volatility is a necessary precondition for viable futures markets as it is only when the price fluctuate that producers, traders and processors find that they need to hedge against price fluctuations. Various factors affect price volatility in agriculture and these are past events, trends, stock levels, yields, transmission across prices, exchange rate volatility, interest rate volatility,

oil price volatility and export concentration.(FAO, 2010). In addition general economic cycles and speculative behavior coupled with asymmetrical market information has contributed to volatility of agricultural commodities. According to Collier (2007), the commodity boom in 2005 and 2006 contributed 2.5% to the growth of an African economy.

### **Brief review of literature**

According to Elton and Guber (1995), a derivative is a financial asset whose value is derived from that of an underlying asset. Hull, (1995) adds that the value of the asset could be derived from a reference rate or index such as stock, bond, currency or a commodity. The private contract between two parties should include the notional amount and the sum of the gains be equal to zero. Forward contracts have their history in the physical delivery of grain on spot transactions at a centralized location and this later developed into the futures contracts as a way of hedging against price fluctuations with the specifications of quantity, date and price. The contractual legal requirement of such contracts is believed to offer the stability in the market and hedge against price fluctuations. Futures contracts deal with standardized and negotiable

exchange traded contracts to buy or sell an underlying asset and traded on organized exchanges. In addition to the derivatives market Options (plain, vanilla, put/call) are some form of nonlinear derivatives, which are instruments that give the holder the right but not the obligation to buy or sell an asset at a specified date and price.

#### *Preconditions for a Derivative market*

AfDB, 2011 notes that with the exception of the SAFEX the introduction of a derivatives market could be limited by trading volumes, such that their roles become limited to providing information and being of a regulatory nature. The small size is complimented by the involvement of the small scale farmer who has limited financial resources to global exchanges and manage risk in contrast to developed nations were 90% of farmers sell their commodities through organized boards. The UNCTAD report of 2005 notes that commodity markets in many African countries remain small and highly informal with the exception of South Africa, Nigeria and North Africa. An active spot market is believed to be one precondition of a viable derivatives market (IFPRI, 2010) The report further notes, the lack of financial literacy and capacity building on particularly farmers as

also alluded by Larson et al (1998), and inappropriate market infrastructure, (soft and hard) as drawbacks to development of African commodity markets. The creation of derivatives market is widely acknowledged for its integration to global markets (Hanson, 2003). Morgan (2001) however notes the difficulty of domestic producers in working with offshore commodity exchanges justifying the need for a domestic commodity exchange. This will enable traders to take positions on any market depending on different market speculation perspectives. Hawkesby (2000), reviewed what attracts market participants to a derivatives market as liquidity, low transaction costs, leverage, arbitrage and transparency as cited also in the earlier work by Black (1986). The storage, product homogeneity, active spot market and macroeconomic stability are believed to be preconditions according to the IFPRI, 2010 report. Work done by Njanike (2010) noted that 30% of financial analysts said it way too early to introduce without elaboration on the nature of the quantitative approach used. There exists a gap in information, on the willingness of farmers and other stakeholders in actually setting up the exchange. Knowledge of efficiency gain or losses of maintain the current status situation becomes also crucial.

Nicholas, 2011 noted 10 preconditions for the success of a commodity market, but these are qualitative variables that include good governance, stakeholder buy-in, accurate contracts, education and training etc. The work however is mainly qualitative with no specific quantitative measures to help access the suitability of such a program. The question of the exact economic threshold for a viable exchange has to be econometrically modeled in a detailed research.

#### *Organized Commodities Exchanges*

Various exchanges are present in the world where various commodities including agricultural are traded. In Africa 10 exchanges are currently listed for trade in agriculture, metals and forex with agriculture being the dominant area. America has 16 exchanges, Asia 36 and Europe 12. Examples include Chicago Board of Trade (CBOT 1848) with 454 million contracts in 2003, New York Mercantile Exchange (NYMEX 1994) the largest commodity exchange market in the world and the London Metals Exchange. In India there are three major exchanges for the commodity trading which are, the National Commodities and Derivatives Exchange Ltd. (NCDEX), Multi Commodities Exchange of India Ltd. (MCX) and National Multi-

Commodity Exchange Ltd. (NMCE). In Southern Africa the Safex Commodities Derivatives Market an arm of the JSE Ltd. The Ethiopia Commodity Exchange (2008), the Agricultural Commodity Exchange for Africa based in Malawi, the Abuja Securities and Commodities Exchange in Nigeria and ZamACE in Zambia is partially active. In Zimbabwe the Minister of Industry and trade announced the launch of the Commodities Exchange of Zimbabwe (COMEZ) on 14 January 2011. Trading is yet to commence to replace the commodity Exchange, which was closed in 2001 when the Government monopolized maize and wheat trading to the Grain Marketing Board. Commodities traded on such exchanges are coffee, sugar and cotton, the Chicago Board of Trade, exchanges corn, soya, wheat and soya oils. In India turnover on such exchanges as a proportion of GDP increased from only 4.7 % in 2003-04 to 18.3 % 2004-05 and further to 76.8 % in 2005-06. In Zimbabwe the government in 2009 established by an act of parliament the Agricultural and Marketing Authority. One of its core mandates is the promoting the marketing and fair pricing of agricultural commodities. AMA is therefore loosely connected to COMEZ and institutional partnerships are weak to drive the full development of a commodities exchange.

### **Does Zimbabwe need a commodities and derivatives market**

Market development is crucial for farm profits. Most agricultural commodities, in particular crops, are subject to strong seasonal production patterns, and their supply cannot always adjust rapidly to changes in prices or demand. This means that agricultural markets are characterized by a certain degree of variability. Structural factors such as demographic growth, pressure on agricultural land and the impacts of climate change may add to growing tensions on agricultural markets. In Zimbabwe as in South Africa and the more developed countries, USA, EU the governments have significantly reduced support prices and related measures on agriculture. As a result, commodity producers and traders are more exposed to market price developments making agriculture more prone to use futures markets to hedge risks. Low prices for agricultural commodities are passed on to the poorest segments of a country in the form of low profits and low wages on farms. For many farmers it is easier to cut costs by reducing labour costs than raise prices and this has an effect on farm productivity. Farmers in Zimbabwe have for long been affected by price volatility and uncertainty. Without a formal way to incorporate prices into

farm budgets farmers are unable to maximize profitability through enterprise selection. Also the announcement by government of prices of certain commodities such as maize and wheat at the beginning of the marketing season have left farmers exposed to market fluctuations and government policy. This has implications on decisions on the next cropping pattern and is a potential driver to low agricultural production of maize, wheat, barley and soya beans. While tobacco is being marketed internationally farmers in Zimbabwe are unable to receive a fair price that is activated by very high price variability. Excessive volatility of food prices affects producers and consumers alike, and has serious effects on security of food supply. While higher global prices could stimulate agricultural production, price transmission mechanisms in developing countries are imperfect as the domestic commodity markets are disconnected from world markets. An options market act as protection against lower prices. The *put option* provides leverage in obtaining credit, assists in production management decisions, and has a formal set of contract provisions and known procedures for settling disputes.

Futures market attracts hedgers who minimize their risks, and encourages



competition from other traders who possess market information and price judgment (Lener, 2000). An efficient and well organized commodities futures market is generally acknowledged to be helpful in price discovery for the traded commodities as farmers and traders have the right, but not the obligation to buy (call) or sell (put) a commodity at a fixed price on or before a given date. Futures contract allows for standardization of quantity, quality and warehousing issues. The painful reality of Zimbabwean agriculture is that unless a vibrant commodity markets is set up a farmer who bears all production risk will continue to have income stripped by middlemen who bears very little risk. This scenario is counter-productive and distractive to Zimbabwean agriculture. The following are the interest groups: 1. *Farmers*-Commercial Farmers Union, Zimbabwe Farmers Union, Indigenous Commercial farmers Union 2. *Reserve Bank of Zimbabwe*, Bankers Association of Zimbabwe and other Financial intermediaries 3. *Government*, Ministry of Industry and Commerce, Agricultural and Marketing Authority and Ministry of Agriculture 4. *formal and informal commodity brokers*

### **Is Zimbabwe ready for the full implimentation?**

To answer the question various attributes need to be looked at.

#### *Infrastructure*

The well-functioning of a commodity market is dependent of supporting infrastructure. Road infrastructure is an important attribute. The ability to move agricultural communities at low costs to warehouses for trade is crucial. Rural road network is poor with most rural areas still having to travel considerable distances to a tarred road network. Road network in areas such as Gokwe North and South, Mberengwa, Guruve/Muzarabani, Nyanga are still in a bad state. However of the 41 districts in Zimbabwe only 5 have a growth point that is not linked by tarred road. Distances to tarred road need to be quantitatively derived as this is substantial implications on transport costs and produce losses. Telecommunications is another factor. Internet penetration in Zimbabwe has increased to between 53 and 58% higher than in many African countries. It is estimated that two in three people of the productive age group has access to a mobile device. Even though access to internet is still limited due to the cost of 3G devices a good telecoms infrastructure such as exists will foster the good development of a commodity exchange.

#### *Storage facilities*

Agricultural commodities are highly perishable and therefore deteriorate

in quality is they are not properly stored. The construction of central warehouses and district and provincial level required capital investment. At farmer level proper storage facilities that are environmentally regulated are a necessity. At face value smallholder farmers have granaries that are self-regulating built by brick and mortar while some commercial farmers have granaries with artificial environmental control. What are the storage capacities for these granaries and how long can they keep agricultural products in a good state? These questions require further research to determine the exact capacity of the nation. Price trends reflect that low prices are prevalent during harvest time of commodities and surge afterwards. Storage and quality become a key factor to enable farmers to sell produce at the right time. Under ZIMACE inspection of the warehouses by an independent inspection company, ITS Socotec. According to GMB the company's storage capacity stands at 4, 895, 000 metric tonnes of which 733 000 is the holding capacity of Silos. In addition the country has other private silos that could be used for warehousing and trade.

#### *Financial environment*

According to the RBZ January 2013 policy statement there were 22 operating banking institutions,

excluding Interfin which is under curatorship, Royal Bank which is under liquidation), 16 asset management companies and 150 microfinance institutions under the supervisory purview of the Reserve Bank as at 31 December 2012. Financial institutions are expected to be intermediaries to facilitate trade. Stability of a commodities exchange is anchored upon the pillars of the financial market. Over the past 10 years a number of financial institutions have collapsed. Trust Bank, Time Bank, Barbican Bank, Royal, Century Bank and Discount House, Rapid Discount House and Intermarket subsidiaries are some of the banks placed under curatorship. As at 31 December 2006, 31 banking institutions comprising of fourteen (14) commercial banks, five (5) merchant banks, six (5) discount houses, three (3) finance houses and four (4) building societies were in operation (Reserve Bank of Zimbabwe, 2006a). The collapse of financial institutions is an indicator of financial instability caused by a number of factors emanating from the macroeconomic policy environment and risk management issues. A major threat to the stability of this sector will be the execution of the 51% indigenization law to the sector and this issue has been a subject of intense debate. That as it may if the implementation or otherwise of the

policy results in a loss of confidence in the financial sector this will result in an unfavorable environment for the creation of a commodity exchange. This area requires urgent further academic research to forecast and estimate policy effects on financial stability. What are the main instruments traded against the expected. In Zimbabwe trade is mainly in shares, Treasury Bills, Bankers Acceptances foreign currency and to a lesser extend forward contacts. South Africa however has a full array of instruments under trade indicating greater depth of the financial market. While the Zimbabwean government has pledged financial support currently amounting to \$1million, more capital injection is required. Exactly how much and the methodology of financing is an area that requires further study.

#### *Legislative environment*

One reason provide for the stalled development of COMEZ has been the disagreement over which ministry in the government it will fall. COMEZ is under the ministry of Industry and Trade with lots of influence however from the Ministry of Agriculture. The result has been the setting up of the Agricultural Marketing Authority in 2012 under the legal instrument Agricultural marketing Authority

Chapter 18:04, with the objective of providing an avenue for trade of agricultural commodities. Schedule 19.13 mandates AMA with the authority to draw, make, accept, endorse, discount, execute and issue for the purpose of business of the authority promissory notes, bills of exchange, bills of lading and other negotiable or transferable instruments. Schedule 19.14 focuses on the promotion of exports of agricultural commodities. The financing of AMA according to part IV of the act will be from parliament, marketing boards (Cold storage Commission Chapter 18:06, Cotton Marketing and Control Act Chapter 18:07, Dairy produce marketing and levy act chapter 18:09, Grain marketing ct Chapter 18:14 and any other act providing for the regulation of marketing of an agricultural commodity) or growers/produces for any service rendered. The implications are that AMA will rely heavily on government support for its viability. With the flooding of information via internet technology and social networking provision of quality information by AMA may provide adequate financial cover should government grants fall. The act however provides also for a leeway for radical changes as it provides that the minister on the recommendation of the authority, may by statutory instrument, declare

any agricultural product to be a designated agricultural product. The two institutions will have to collaborate and cooperate to ensure an efficient marketing system for agricultural commodities.

### *Indigenization laws*

In the year 2007 the Zimbabwean parliament enacted the Indigenization and Economic Empowerment act 14:33 that entitles according to Part II,3,1,a that at least fifty one percent of the shares of every public company and any other business shall be owned by indigenous Zimbabwean (*any person who, before the 18<sup>th</sup> of April 1980, was disadvantaged by unfair discrimination on the grounds of his or her race, and any descendent of such a person, and includes company, association.....*) The act therefore controls the merger or restructuring or acquisition of business to comply with the 51% guideline but includes temporary provision for the purposes of subsection 5. The setting up of such a commodity exchange would have to comply with the existing law. However, literature on the setting up of such an exchange shows that there is need for collaboration with established exchanges and in the case of Zimbabwe with SAFEX may require the invocation of the provision of subsection 5. Part II, 3, e

specifically stipulates that no projected or proposed investment in a prescribed sector of the economy available for investment by domestic and foreign investors for which an investment license is required in terms of the Zimbabwe Investment Authority Act Chapter 14:30 shall be approved unless there is a controlling stake in the investment by indigenous Zimbabweans. In courting potential partners in the establishment of the commodity exchange such provisions should be taken into consideration. Potential legislative challenges have to be looked at. The banking sector is regulated under the Reserve Bank Act 22:15 and legal debate is still underway on how far the Indigenous and Economic Empowerment act can supersede the Reserve Bank Act. If the commodities exchange is regulated by the ministry of Finance through RBZ act then legal hurdles on empowerment have to be cleared. The RBZ act however in its definitions only include banking business, and banking institution as a commercial bank, accepting house, discount house of finance house. The definition of the act seem to exclude a commodity exchange that trade commodities but that is supported by banking institutions. The stability and well functioning of a commodities and derivatives exchange would on that basis fall under the jurisdiction of the RBZ. In addition trade in

derivatives can be a source of credit risks for finance institutions hence the need to properly align the laws. On the prima face the Commodities exchange in Zimbabwe will have to comply with the Indigenization and Economic Empowerment act 14:33. Part II,4 spells out the powers of the Minister( minister of State for Indigenization and Empowerment or any other Minister to whom the President may, from time to time, assign the administration of this act) to review and approve indigenization and empowerment arrangements.

Ownership of SAFEX is wholly by the Johannesburg Stock Exchange (JSE) and is JSE is licensed under the securities services act 2004. The Chicago Mercantile Exchange (CME) Group inc operates as public company and is the parent company of 5 other exchange companies. In Malawi, Auction Holdings Limited (AHL) Commodities Exchange is wholly owned by AHL a private company. The exchange is not

listed on the Malawi Stock Exchange. What is apparent is that the exchange in Zimbabwe could be launched as a private company or as a member of the Zimbabwe stock Exchange. Full global integration is required for to allow the free flow of capital. For example SAFEX continually engages with international partners, is a member of the World federation of Exchanges and is in partnership with the London Stock Exchange for the operating settlement software (SETS). The effect of 'sanctions' on global partnerships should therefore be fully considered in trying to operationalise a commodity exchange in Zimbabwe. The willing to of investors to invest under the Zimbabwean environment can be further investigated using the Delphi technique.

#### Land laws

The land reform laws have been subject to so much dabate and have a bearing on the productivity of agriculture in Zimbabwe.

Table 1: Trends land acts

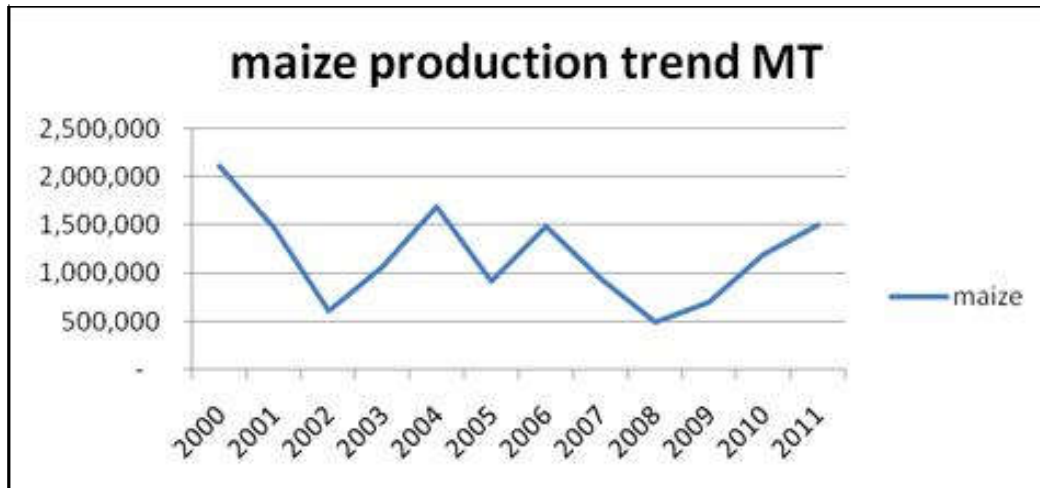
Year	Act	Major elements
1981	Communal land act	Changed tribal trust lands into communal areas Authority form traditional rules to local authorities
1985	Land acquisition Act	Willing seller willing buyer for land Government first right to purchase land
1992	Land acquisition Act	Removing willing seller willing buyer concept Limiting farm size Introducing land tax Government empowered to compulsorily buy land for distribution

1999	referendum	No vote for compulsory acquisition without compensation by government
2000	Fast track	Occupation and takeover of white owned farms Constitution change amendment number 16 Land transferred responsibility for compensation from government.
2013	New constitution	Chapter 16 Continuation of rights of occupiers by virtue of offer letter of lease agreement Right to land and ownership of land by the state Compensation for land improvements by the state subject to legal qualifications

*Price variability and volumes of trade*

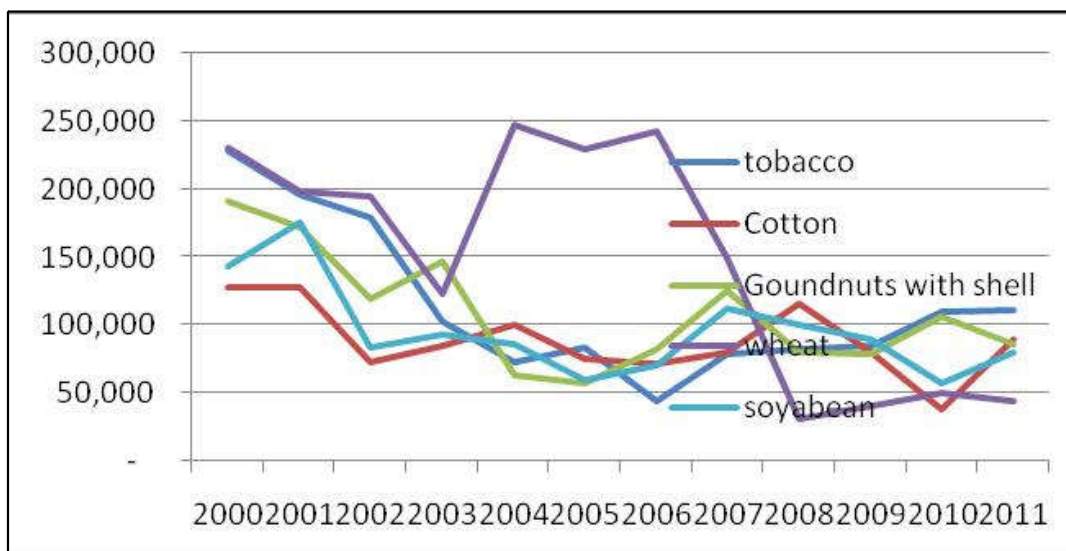
According to Cuthbertson and Nitzche (2001) the major objective of setting up a commodity exchange is to minimize price uncertainty and one requirement for a vibrant exchange is that the underlying assets should exhibit great volatility. Volume ensures that the exchange will be viable and sustainable in the long run. There are estimated 1 million smallholder farmers and 500 thousand commercial farmers. During the ZIMACE era minimum stipulated volumes were traded i.e. maize, sorghum, soyabean, wheat – five tonnes required, beans-one tone, cotton-five bales, and beef had no minimum number and was traded o

live weight basis. However these sizes are considerably low compared to South Africa that has a standard size, maize: 100 tonnes, 50 tons wheat and sunflower and 25 tonnes soya beans. By 2001 the value of contracts traded at the ZIMACE was approximated at US\$500 million. Maize consumption in Zimbabwe is estimated at 2.2 million tonnes and over the last ten years the country has failed to meet its local demand by between 30 and 80%. The implications are a constraint supply that increases the possibility of price variability. The table below shows the output trend of maize between 2000-2009.



**Fig 1:** Maize production trend in metric tonnes  
Source: FAO database

Other commodities that have the potential for trading on the commodity exchange have shown also variability in output as shown by fig 2 below:



**Fig 2:** Commodity trend 2000-2011  
Source: FAO database

Sustainability of the commodity exchange will hinder on sustained production and market potential. As long as there is a mismatch between demand and supply the some measure of risk is assumed to be inherent in the market.

Table 2: Estimated country requirements

Product	Estimated domestic consumption (MT)	Lowest production in last 12 years	Highest production in last 12 years
maize	2 200 000	496 000	2 100 000
wheat	380 000	31000	230 000
Soya beans	150 000	57 000	175 000
Groundnuts with shell	Figure unavailable	57 000	190 000
Cotton	105 000	38 000	128 000
tobacco	27 270	44 000	227 000

The surge in local consumption driven by mainly growth in the oil, poultry and pig industries growth of 18% will increase pressure on the market hence increase the volatility of prices. According to the Soyabean report 2011 there if great regional Soyabean demand estimated at 2 million MT creating more opportunities for regional commodity integration. Ultimately on that basis a fair trading system in the form of a commodities exchange may benefit the farmers and traders. Strong global demand for local tobacco has ensured that Zimbabwe has a thriving tobacco auction market that has 5 players.

Zimbabwean agriculture is mainly divided into large scale and small

scale agriculture. The production of maize, groundnuts and cotton for example is predominantly done by the small scale and communal farmers. This creates therefore a challenge of a fragmented marketing and production system. Coupled with low yields threshold volumes need to be collated in an organized manner for such farmers to benefit from a commodities exchange given that minimum volumes would be required. Wheat, soyabean and tobacco are mainly grown on a medium to large scale and output is higher because of the heavy involvement of the private sector in contract farming. The trading of these commodities will therefore hinder on the response and willingness of contractors in net gains are anticipated.



*Price volatility*

The four graphic illustrations below show the change in the average price variable a continuous period over between 2012 and 2013 with the exception of beef prices which only reflect the year 2013 as monitored by the Agricultural Marketing Authority.

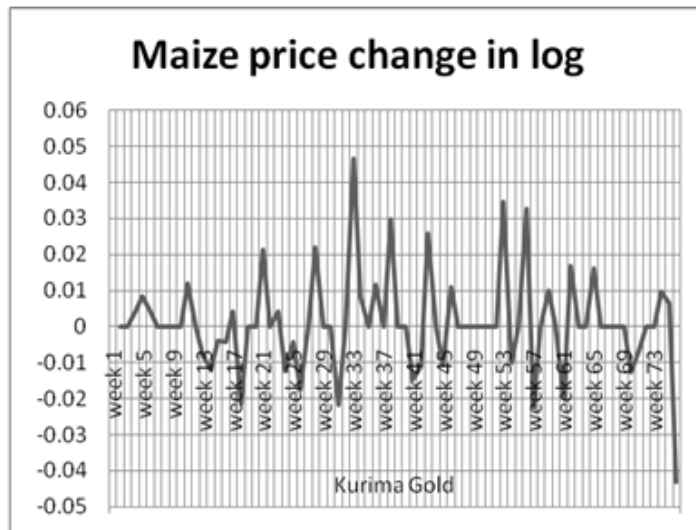


Fig 3: maize price volatility (log of change)

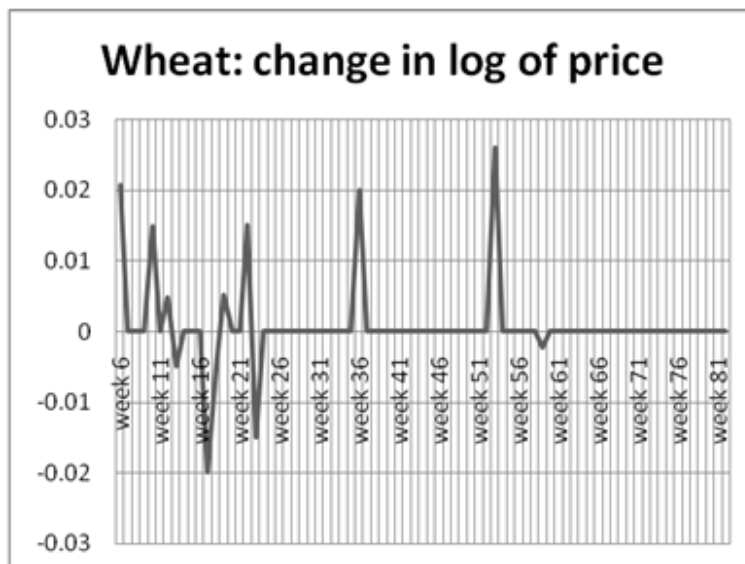


Fig 4: wheat price volatility (log of change)

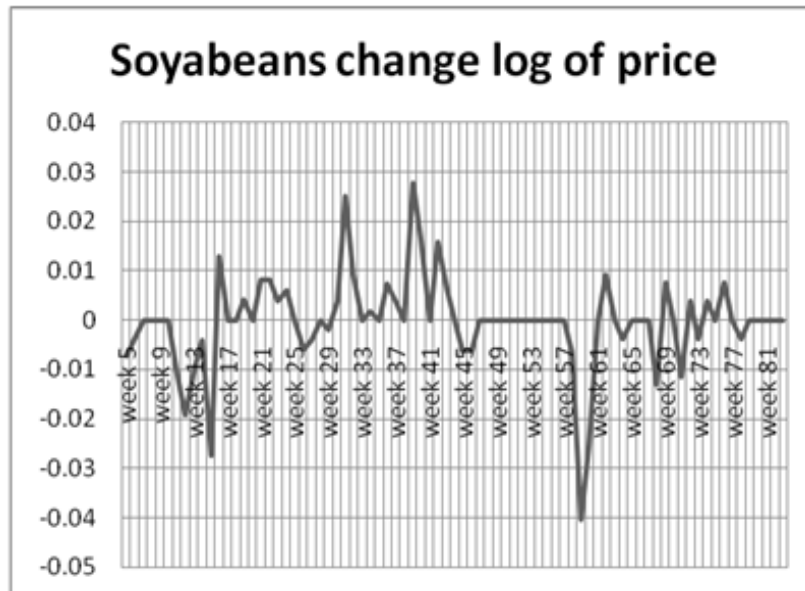


Fig 5: maize price volatility (log of change)

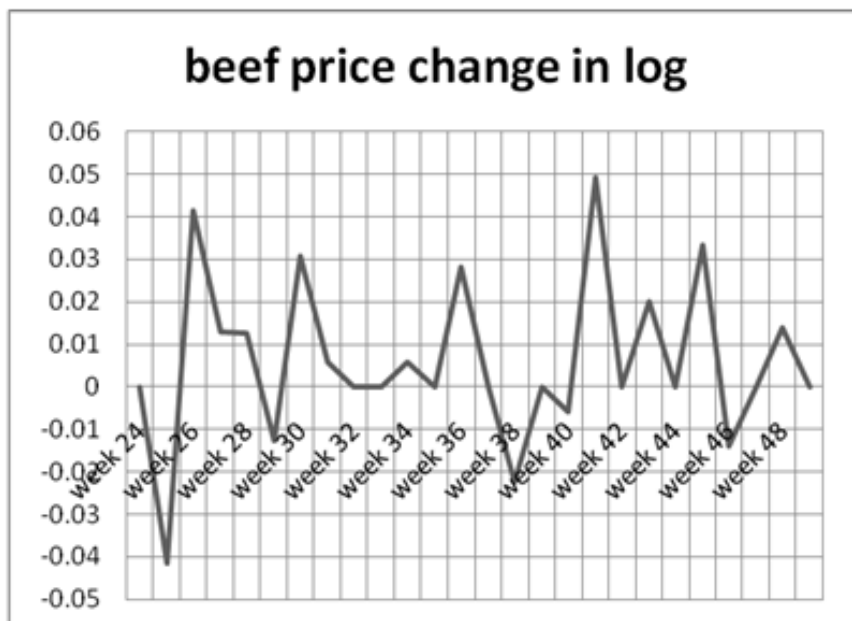


Fig 6: maize price volatility (log of change)

The key question that needs further investigation is on whether these movements are reflect sufficient volatility in market behaviour for the exchange to be viable. The commodity volatility index has to also be calculated and compared to with other viable commodities exchange. Time series analysis and the deployment of the ARCH/GARCH modelling, Engel, 1986 will help understand the nature of price movement. No commodity volatility index studies are yet available in Zimbabwe and this provides a research gap. Volatilities then have to evaluate against major exchanges such as was done in the work by Geyser and Cutts (2007) for the SAFEX.

#### *Agricultural commodities and weather*

Agriculture is depended on weather and the risks in supplying agricultural commodities are increased when bad weather is taken into account. Beginning September 1999 a weather futures contract market has been available in the USA. In 2000 the European weather derivatives was launched with traders who intend to hedge being farmers insurance companies and insurance companies that are affected by adverse weather conditions. The recurrent drought in Zimbabwe of

2002, 2007, 1992, 2002, 2005 and 2012 require that drought be modelled as a component of the commodities exchange. Winter frosts have affected flower and horticultural farmers in Zimbabwe. In addition the probability of cyclones/tsunamis while small is an important contributor to price volatility on the commodities exchange. Therefore options to adopt a *whither weather futures* are as relevant to Zimbabwe as elsewhere in the world.

#### *Capacity building*

Larson et al, (1998) concluded sufficient training is required for the trade in a commodity market. With the current crop of newly resettled farmers there is need to train farmers to appreciate the value of risk management. The training of trainers program to capacitate the Department of Agricultural Technical and Extension services (AGRITEX) and other developmental agencies will be key to acceptability of the change if desirable. Current training programs by Agritex and the department of Livestock are production oriented with lesser emphasis on marketing alternatives. There is a knowledge gap in curricular development on quality control, storage and organizational logistic specifically to manage output.

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