



**Agricultural Commodity Exchanges and the Development of Grain
Markets and Trade in Africa: A Review of Recent Experience**

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T.S. Jayne, Chris Sturgess, Ron Kopicki, and Nicholas Sitko

**Working Paper 88
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Indaba Agricultural Policy Research Institute (IAPRI)
Lusaka, Zambia
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Any views expressed or remaining errors are solely the responsibility of the authors.

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EXECUTIVE SUMMARY

Vibrant agricultural commodity exchanges will greatly enhance the performance of Africa's agricultural sectors and contribute to overall economic development. Yet specific conditions in grain markets are required for agricultural commodity exchanges to develop.¹ The absence or short-lived nature of many of these conditions explains why commodity exchanges for staple grains have remained stunted in Sub-Saharan Africa despite strong interest in their development by the international donor community and by most elements of the private sector. This study identifies these preconditions and assesses the scope for development organizations to support the sustainable development of commodity exchanges in eastern and southern Africa.

Six main factors impede trading on agricultural commodity exchanges in the region. They are: (1) limited success in attracting financial institutions' commitment to commodity exchanges, both as agents who are able to complete the transfer of payments from buyer to seller and as lenders to exchange participants; (2) the failure of exchanges to offer contracts that respond to unmet trader needs, especially those seeking mechanisms for hedging quality, price and delivery risk; (3) the inability of commodity exchanges to reduce the transaction costs of exchange, which is one of the major theoretical benefits of a commodity exchange. The anonymous nature of trading on a commodity exchange can exacerbate trading risks rather than reduce them when contract safeguards are missing and contract compliance is only weakly enforced; (4) the potential for conflict of interest among brokers who also act as off-market traders; (5) the potential for market manipulation, which occurs when markets become thinly traded, for example when marketing boards purchase a significant portion of the national marketed output or when risks associated with trading on an exchange are asymmetric between buyers and sellers; and (6) actors trading in thin markets are forced to absorb high fixed costs when limited trading volumes do not allow costs to be amortized over a large volume base of transactions. Exacerbating all these factors is the unpredictability of government intervention in commodity markets.

Factors that signal a hospitable environment for the introduction of grain commodity exchanges include (1) a readiness of financial and banking firms to fulfil commodity exchange transactions and to lend to actors in the grain sector based on a perception that it is profitable for them to do so; (2) a strong demand and willingness to pay among actors in the grain industry for risk-shifting instruments; (3) a management entity that is perceived to be trustworthy, even-handed, and yet decisive in its approach to resolving contract disputes between market participants, based on clearly defined rules of behavior for participating on the exchange; (4) transparent rules governing the behavior of brokers; (5) a commitment from governments to adopt transparent and predictable rules for direct state operations in grain markets, including trade policies; and (6) vibrant spot markets with large trade volumes are already in place.

It is not necessary for all of these factors to be in place before donor organizations can meaningfully support the development of agricultural commodity exchanges. The important point is to conceive of support for commodity exchanges holistically, recognizing that all commodity exchanges operate within a system, and that support for overcoming weak aspects of the grain marketing system will be needed as part of a comprehensive program to support the development of agricultural commodity exchanges. Development partners can play a catalytic role in supporting the development of agricultural commodity exchanges as long as

¹ For an explanation of technical terms relevant to Commodity Exchanges, See Appendix 1 at page 27.

there is sufficient commitment, first from actors in the financial and commodity sectors, and secondly from governments to ensure stable and predictable commodity marketing and trade policies. Development partners could assess, on the case by case basis, the degree to which this commitment exists. In the more favorable countries, donors could provide interim support for basic nuts and bolts strengthening of the grain marketing system (e.g., warehouse certification services, collateral management and settlement services, contract dispute resolution processes, investments in transportation infrastructure), while also nurturing the status of the six conditions specified above.

Fortunately, there are signs of increasing commitment to the development of commodity exchanges by some governments in the region. Detailed consultations are needed to ensure that governments understand how commitment to the development of commodity exchanges would circumscribe their behaviour and policy choices. In particular, prospects for the sustained development of commodity exchanges are highest where governments are prepared to accept a more limited and predictable approach to intervening in grain markets and to trade policy. To date, most governments have considered such commitments to impose unacceptable constraints on their mandate to ensure national food security.

A major conclusion from this study is that commodity exchanges should not be viewed as panaceas for rectifying the many challenges facing African agricultural markets. The development of a commodity exchange is not an end in itself, but is rather an important component in the process of developing efficient marketing and trading systems that promote social welfare. While commodity exchanges can improve the efficiency of markets in the region, they cannot be expected to impose order on dysfunctional markets. Only once the major grain markets of the region are able to achieve minimum threshold levels of policy stability will investment in commodity exchanges begin to contribute meaningfully to market performance and to advancing national food and agricultural policy objectives.

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ACRONYMS

ACE	Agricultural Commodity Exchange for Africa
AHCX	Auction Holdings Commodity Exchange
AHL	Auction Holdings Ltd.
BM&F	<i>Bolsa de Mercadorias e Futuros</i>
BVO	Bid Volume Only
CES	agricultural commodity exchanges
ECX	Ethiopian Commodity Exchange
FRA	Food Reserve Agency
GMO	Genetically Modified Organism
IAPRI	Indaba Agricultural Policy Research Institute
LuSE	Lusaka Stock Exchange
MACE	Malawi Agricultural Commodity Exchange
MAL	Ministry of Agriculture
MT	Metric Ton
SAFEX	South African Futures Exchange
SI	Statutory Instrument
UNCTAD	United Nations Conference on Trade and Development
US\$	United States Dollar
WFP	World Food Programme
ZAMACE	Zambian Agricultural Commodity Exchange
ZNFU	Zambian National Farmers Union

1. INTRODUCTION

Agricultural commodity exchanges are typically associated with efficient and sophisticated markets, providing valuable benefits such as price discovery, publicly available market information, contracts for minimizing price risks, low transaction costs of exchange, and insurance against potential opportunistic behavior of trading partners. But these benefits are far from being achieved in any African country except for South Africa. Few if any commodity exchanges in Africa are thriving or even solvent. Why?

This study is motivated by the need to better understand why agricultural commodity exchanges in the region have thus far failed to develop into sustainable trading platforms and to identify the critical changes needed to enhance their performance. Our objectives are to review the evidence and experience of agricultural commodity exchanges in Africa, updating prior analysis of case studies and providing new information in some cases. Based on this review, we assess the near term potential of commodity exchanges to improve the functioning of staple grain marketing systems in the region and identify the conditions needed for the successful and sustainable development of commodity exchanges. We argue that an appreciation of the system-wide impediments to the development of sustainable commodity exchanges will reduce the likelihood of failed start-ups and redirect donor support toward investing in the building blocks of efficient agricultural markets as an interim stage in the process leading to direct support to commodity exchange management entities.

2. WHAT PROBLEMS CAN A COMMODITY EXCHANGE ADDRESS?

Commodity exchanges can reduce the costs and risks of transacting. They can provide valuable public information such as prices and volumes of trade. In many indirect ways, they can encourage the financial sector to invest in agricultural value chain development, improve farmers' access to markets, reduce marketing margins, and encourage agricultural productivity growth.

In recent years, however, unrealistic expectations have resulted in commodity exchanges being promoted in markets that were not yet ready for them to succeed. It has sometimes been implied that commodity exchanges are institutions that can be grafted onto unregulated markets to impose order and stability on informal markets and provide a range of new services for participants. Commodity exchanges are a logical outgrowth of reasonably well-functioning spot markets. An under-appreciation of the preconditions for new commodity exchange start-ups to succeed has led to the collapse of several African commodity exchanges, creating disillusionment and arguably a hesitancy to continue investing in them. These outcomes could be avoided in future with a clear understanding of the preconditions for the successful introduction of commodity exchanges.

There is consensus that the most important marketing-related constraints facing Africa's farmers revolve around the following five points: (1) high production and marketing costs, leading to low profitability and a disincentive to produce for the market; (2) constrained access to credit, especially for small-scale farmers; (3) limited availability of profitable new farm technologies to adopt and use sustainably; (4) price volatility; and (5) poor market access and competitiveness conditions. This section considers how agricultural commodity exchanges (CEs) could address each of these problems and improve the functioning of grain markets. We then identify the minimum set of conditions that would need to be in place for agricultural commodity exchanges to thrive.²

2.1. High Production and Marketing Costs

Commodity exchanges are unlikely to bring about major reductions in the costs of inputs or improvements in the availability of new farm technologies. However, well-functioning CEs could reduce the transaction costs and risks of exchange and thereby shrink the wedge between the prices received by farmers and the prices paid by consumers. If the commodity value chain is competitive, then the reduction in marketing costs at the various stages of the system can provide important benefits to both farmers and consumers. However, the lion's share of marketing costs are related to distance to market, transport cost rates, interest rates on stored inventory, labor handling costs, and taxes. A commodity exchange cannot directly affect these factors in any major way.

2.2. Constrained Access to Credit

CEs rarely if ever provide credit directly to farmers. CEs can support the development of warehouse receipting systems, which can increase the supply of credit finance to traders. Indirectly then, by increasing the supply of credit to assembly traders, farmers operating in a competitive marketing environment may receive more seasonal credit from traders. These

² Some technical terms and services pertaining to commodity exchanges are defined and described in Appendix 1.

connections between CEs and farmer access to credit are indirect and contingent on the behavior of market intermediaries, yet potentially quite important. In Africa most CE's are launched into business ecosystems where conduits for capital supply to agricultural activities are primarily informal and equity based. With that said, involving major financial institutions in lending to and intermediating risk within the agricultural sector can and should become a major objective of CE development.

2.3. Limited Availability of New Farm Technology

CEs cannot directly support sustainable agricultural intensification or new technology generation. In cases where a virtuous cycle of investment in new technology, productivity gains and wealth creation has been achieved, then CEs can indirectly but potentially substantially strengthen this kind of virtuous cycle. The main point is CEs cannot encourage farm technology investment and productivity growth directly, but can indirectly promote such processes in a favorable enabling environment where there are already positive incentives for investing in the agricultural system.

2.4. Price Volatility

CEs are not designed to reduce market instability *per se*. In fact CEs require for their smooth functioning the ability of prices to be freely determined based on short-term supply and demand conditions. Policy makers must be committed to allowing the market to find its own price (within pre-specified bounds) in order for CEs to succeed. If policy makers feel that it is necessary to use discretionary measures to keep prices within politically tolerable bounds, then those markets are not likely to be good candidates for the introduction of commodity exchanges or the offer of risk management tools.

With that said, commodity exchanges can provide risk management tools that allow marketing actors to hedge their positions in future crops. Mature commodity exchanges, which price and sell risks through futures contracts for example, can also make the financing of farm inputs and fixed agricultural assets less risky for financial institutions. Commodity exchange management entities that understand the risk management requirements of traders, farmers and financial institutions will be in a relatively good position to develop the services and incentives for these actors to want to trade on the exchange. Well-functioning commodity exchanges can therefore support the use of forward contracting, futures trading, and other activities that allow market actors to mitigate the consequences of unpredictable market price movements but not the magnitude of price volatility *per se*.

2.5. Farmers' Market Access Conditions

CEs cannot directly improve farmers' market access conditions or the degree of competition in assembly markets *per se*. However, if a commodity exchange can be successfully introduced, it is likely to attract new firms into the market which may contribute to greater competition among traders at various stages of the value chain and improve farmers' market access conditions. As new entrants enter food markets they compete away the rents that dominant traders might have enjoyed earlier. This process of new market entry and enhanced competition for farm product can be accelerated when CEs provide services that previously were available only to dominant traders. An important example of such a service is price discovery. If the commodity exchange publicly publishes daily strike prices and trade

volumes agreed through the exchange, such information will reduce the information advantages of dominant firms, substantially level the playing field with regard to information, and promote new entry by other firms that would ultimately improve farmers' access to markets.

A tipping point mechanism appears to be at work between the legacy conditions prevailing in informal commodity markets and the ability of commodity exchanges to create transformational change in the grain value chains. Achieving these threshold conditions depends holistically on the policy environment, the advantages that CEs are able to create for millers, brewers, stock feeders and other large-volume grain purchasers, and on the level of support available in the business ecosystem and in particular from commercial banks, other financial institutions and third party warehousemen.

2.6. Summary

What can well-functioning commodity exchanges do? If introduced into poorly functioning markets with limited new private investment in the value chain and suffering from low levels of farm productivity and profitability, the answer is “not very much”. In such an environment, our view is that other types of investments would have a higher payoff to scarce government and donor funds, including those aimed at attacking the root causes of low farm productivity and weak private investment in the value chain.

However, for food value chains exhibiting rapid private investment and new entry, commodity exchanges can add value in many ways. They can indirectly encourage the financial sector to invest in the agricultural value chain and contribute to technical innovation and productivity growth. They can indirectly improve farmers' access to credit. They can produce valuable public price information that levels the playing field among actors at all stages of the value chain. They can improve farmers' access to markets and encourage greater competitiveness at various stages of the value chain.

3. PRE-CONDITIONS FOR THE SUCCESSFUL INTRODUCTION OF AGRICULTURAL COMMODITY EXCHANGES

What are the circumstances that must be in place for a commodity exchange to succeed? We identify five main factors: (1) a pre-existing vibrant spot market; (2) the potential to achieve sufficient volume traded across the exchange to cover its fixed costs; (3) the presence of ancillary marketing services being offered to enable a commodity exchange to be instituted at relatively low cost; (4) modes of institutional governance and appropriate incentives sufficient to motivate rapid learning on the part of the CE's management and (5) a commitment from government to desist from unpredictable and discretionary forms of intervention in commodity markets.

3.1. A Vibrant Spot Market

Spot markets refer to cash transactions between two parties without the use of an exchange. Spot markets commonly arise when there are multiple buyers and multiple sellers negotiating with each other until trade terms are agreed. Wholesale spot markets for cereals and other agricultural commodities are commonly found in urban areas of Africa. Spot markets that trade sufficiently high quantities will be in a position to easily cover the costs of running a commodity exchange.³ Spot markets with sufficiently numerous buyers and sellers can generate trust that the price discovery process of an exchange will be fair. If these conditions are not met, a commodity exchange cannot function for long.

Food staples are typically traded between four and six times as they move from the farm to the consumer. Traders possessing timely and accurate information about prices in urban markets or in adjoining deficit countries have an advantage in negotiations. Traders able to assemble and store large stocks in grain in surplus areas have even larger advantages which are further compounded when they also enjoy better access to liquidity and superior storage facilities. Dominant trader networks exist in most east and southern African countries. The economic rents that they are able to collect may be quite significant. The market reactions and competitive responses of well entrenched, dominant traders pose a significant challenge to fledgling commodity exchanges.⁴

Demand side considerations also affect the vibrancy of spot markets. In many countries relief agencies play a dominant buying role. In some cases these agencies require that all of their local grain products be procured based on their own internal purchasing and quality control requirements. These requirements may be difficult to adapt to the buy-side conditions that a CE offers, and indeed may advantage dominant traders in the market by virtue of minimum volume, prior ownership, proof of standing supply, and other idiosyncratic procurement conditions.

³ It is difficult to quantify the minimum volume necessary to capitalize the exchange as this depends on the per ton value of the commodity, and the operating costs of the exchange, which depend in turn on the level of services already provided in the market. A minimum order of magnitude estimate would be in the neighborhood of 20,000 mt. However, if the management entity of the exchange needed to provide warehouse certification or other services not already provided in a particular market, then the minimum volume requirements could easily double or triple. And it is likely that volumes much larger than this, spaced out on a near daily basis would be required to generate accurate price discovery and not be vulnerable to manipulation from relatively big transactions.

⁴ For example, to our knowledge several specific large multi-country trading firms have, to date, chosen not to trade on commodity exchanges in countries where they operate or formerly operated.

Similar special case procurement issues pertain to the buying and selling practices of national food security agencies. The single largest traders in the grain markets of many African countries are often the government or the relief agencies or both. Engaging both of these large volume market participants—donor agencies and state traders -- in new commodity exchanges would significantly improve spot market vibrancy and assure that CE's were able to secure much needed trading volume.

Although the specific context varies from country to country, most food marketing systems share the common challenge of generating competition from both sides in the market. Exchanges have tried to overcome this challenge by providing order books to participants from neighboring countries with the aim of increasing the number of participants in the market place. Other interim measures to raise the volumes traded on a CE would include setting up trading contracts for a range of commodities such as oilseeds, legumes, wheat, and (under certain carefully circumscribed conditions) industrial cash crops. Another interim measure would be to lowering the minimum contract volume to encourage smaller traders and farmer groups to experiment with the exchange.

Take-away Message: Traditional market structures in SSA, particularly for food staples, involve significant asymmetries between sellers, who are primarily smallholder farmers, and large buyers, who have superior access to information and working capital. Dominant market participants do not always appreciate the transparency that comes with commodity exchanges since this reduces their profit potential as there is improved access to publicly available price information. Because they are often major participants in the market, it is imperative to gain their support in order to increase the liquidity in the market place. Particularly in markets where there is a strong over the counter (OTC) or forward market it is often very difficult for a commodity exchange to enter this space and provide a transparent platform encouraging participants to use the new platform when the existing way of contracting has worked well for dominant firms in the past.

3.2. Covering the Fixed Costs of Running an Agricultural Commodity Exchange

The costs of running a commodity exchange are largely fixed costs; variable costs are very low. The financial structure associated with operating an exchange entails large front-end capital costs. These front-end expenses include professional fees for legal advice and regulatory organization, the management services needed to run the exchange, trading systems installation, trading floor build-out, and in some cases storage and warehousing development and the provision of certification and arbitration systems. It has been estimated that the front-end capital costs associated with installing systems and building the platform for an African exchange can run between \$5 million and \$15 million, depending on the degree to which key services, market institutions and infrastructure are already in place.⁵

In addition to capital costs, the fixed cost structure of an exchange includes overhead and management costs. While some small CEs have operated on as little as \$100,000 per year, the costs for larger exchanges can exceed this by at least five-fold, depending on whether the exchange decides to *buy* (out-source) vs. *make* (in-source) certain functions. Because the decision to out-source or in-source particular functions heavily affects overhead costs, these decisions critically determine the financial viability of an exchange. The decision to out-

⁵ Based on interviews with the management of several commodity exchanges in Africa.

source or internally provide a task depends on the existing level of development of the particular market. An exchange may wish to sacrifice some operational control for a reduced fixed cost burden.

There are two sets of services essential for the success of a CE that can be either out-sourced or in-sourced. These include settlement services and collateral management services. Settlement services are most conveniently delivered by commercial banks. They involve transferring funds from the bank account of buyers to the account of sellers upon the completion of a transaction and the notification of trading partners that the funds have been distributed in compliance with standing orders from the exchange. An efficient and reliable inter-bank transfer system is a prerequisite for an exchange to use third-party settlement services. Inter-bank funds transfer systems do not exist in many parts of Africa. Indeed, in some African countries it is not even possible to do same-day transfers of funds between accounts held within a single banking network. In cases in which third party settlement services cannot be arranged, exchanges may require their licensed traders to maintain sufficient cash reserves to cover their buying activity and to nominate the exchange as a transaction agent for the purpose of drawing down funds on behalf of sellers. This of course imposes additional fixed costs on the exchange as well as on those trading across the exchange.

Collateral management systems are important for establishing trust among market participants that the commodity exchange can honor its contracts. In some African countries--those that have already implemented warehouse receipt systems---third party⁶ collateral managers can be engaged from existing licensed public warehousemen. If licensed warehouse certification services do not exist, then collateral managers would need to be certified and licensed by the CE itself to operate on its behalf. In either case, collateral managers take physical control of the farm commodity assets being traded, certify their quality and assure potential buyers that assets under their control comply fully with quality standards adopted by the exchange. They transfer ownership rights from sellers to buyers upon the execution of a trade and transfer of funds. Importantly as well, they record details of the asset transfer relationship in the exchange's management system, they monitor customer exposure and collateral received or posted on the agreed market-to-market, to call for margin as required, to transfer collateral to its counterparty once a valid call has been made, to check collateral to be received for the eligibility, to reuse collateral in accordance with policy guidelines, to deal with disagreements and disputes over exposure calculations and collateral valuations, and to reconcile the portfolio of transactions.

Significant variability exists among exchanges not only with respect to overhead costs but to capital costs as well. Front-end capital costs associated with the organization of the Ethiopian Commodity Exchange (ECX), for example, have been variously estimated to range up to \$55 million. Assuring that capital resources are used prudently and sparingly is one of the keys to the economic sustainability for a new exchange. Unfortunately, the principle has not been upheld in the development of some of the exchanges organized in east and southern Africa over the past decade.

In addition to capital costs exchanges incur on-going overhead expenses for product testing and quality certification, trading floor management and information systems management. In addition, overhead operating costs for an exchange are estimated to range widely as well, in some cases exceeding \$1 million per year.

⁶ *Third party* in the sense that they are affiliated with neither the buyer nor the seller.

Other CE expenses vary according to volume traded. Once an exchange has started trading, the marginal cost of creating additional contracts to trade on the exchange are very small, such that unit costs of transacting decline as volume traded rises. An important success criterion of a CE, therefore, is to spread the fixed over high volumes traded across the exchange. In this happy situation, buyers and sellers are likely to find that the benefits of using the exchange exceed the costs and therefore willingly pay for the costs of running the exchange. By contrast, low volumes traded impose relatively high costs on individual traders, resulting in some of them exiting from participation. As the exchange loses participants, its fixed costs must be carried by a smaller number of firms, resulting in ever higher costs per participant. Naturally, once this scenario starts to unfold, the CE tends to either fold quickly, or limp along if it can continue to attract donor funding.

Take-away Message: In order for an exchange to operate profitably it must be able to cover its fixed costs, including the cost of capital associated with starting up. Commodity exchanges must reach a break-even level of transactions within a relatively short time. Sufficient market size also reduces the risk of market manipulation. Because of the fundamental importance of achieving adequate market size, sustainable commodity exchanges are rarely, if ever, thinly traded. Commodity exchanges either grow quickly into heavily traded institutions or they fail. Without expanding to encompass trading beyond national borders, many exchanges are unable to reach break-even volumes. Therefore, securing public sector cooperation in removing barriers to regional trade will be crucial for governments that are serious about promoting agricultural commodity exchanges.

3.3. Ancillary Market Institutions and Services Required of a Commodity Exchange

Some of the main problems of initiating agricultural commodity exchanges in Africa are problems relating to the general business climate. Building up a supportive business ecosystem is much easier in markets that are already well organized, where an auction system has been operational for some time, and where other aspects of structured trade are already in use. Some of the hallmarks of a well-functioning spot market include (i) trading according to grades and standards, (ii) specified delivery points with sufficient storage capacity to handle marketed volumes; (iii) warehouse certification and collateral management services, (iv) bank settlement services, (v) a clearly defined set of exchange rules that form the reference for all transactions; and (vi) established procedures for resolving disputes.⁷ It is all the more important that the exchange dispute resolution process be quick and efficient as relying on the courts to resolve issues in most jurisdictions is time consuming and costly.

Creating commodity exchanges in markets where trade has traditionally been informal, unstructured and based on kinship or ethnic ties is more difficult because of the challenges in setting up the aforementioned range of associated services required for CEs to survive. If these services can be developed in existing spot markets, it then becomes more manageable to introduce a commodity exchange on top of the existing platform. Often when setting up an

⁷ While governments may encourage the private sector to establish these services and rules, unintended adverse consequences often result if governments impose these rules on private traders. There is an important distinction between voluntary and accepted standards developed by marketing actors themselves and mandatory standards imposed by governments. For example, buyers and sellers in different markets have different grades and quality standards and there are therefore serious risks of creating new trade barriers when quality standards that do not relate to science-based health concerns are made mandatory. In some cases, however, well accepted science-based government regulation is indeed required to protect human, animal, and plant health.

exchange the focus is on securing trading activity, yet it is critical that there be a set of rules defined that will form the reference for all transactions concluded. Should the rules in place not be clear and enforceable, this makes it extremely difficult for the exchange to establish itself in the market place as a valuable role player where transactions can be concluded with confidence. The start-up of a commodity exchange does not automatically produce these associated business services.

Take-away Message: Commodity exchanges should not be thought of as institutions that will bring order to otherwise dysfunctional or underdeveloped markets. The reverse is more accurate, i.e., a market and entire value chain that has already instituted a wide range of business services that reduce the costs and risks of exchange will be more likely to successfully initiate a commodity exchange.

3.4. Governance and Incentives

Most commodity exchanges operate in a competitive environment in which they must earn their way by demonstrating that they can create more value for traders than prevailing market institutions.⁸ Competitive success in such environments requires experimentation and rapid learning. It requires that CE's possess sufficient flexibility and authority in their corporate charters or regulations in order to take decisive action, to invest in new service capabilities when appropriate and to borrow money if required to realize their full competitive advantage. Just as importantly, competitive success requires that CE managements be motivated to work within hard budget constraints in order to maximize the value they create and the profit they are able to capture for their investors. The quality of the management team and their experience with business process *best practices* are equally important.

A successful team will be able to overcome the multiple tests, which come before financial success. Getting the balance right, for example, between sufficiently capitalized and insufficiently capitalized CE's is difficult and requires experience, as well as an ability to innovate. Defining the terms of contracts, which respond to prevailing market failures is difficult as well. As is the need to modify the cost structure of the CE to match full potential of the market which the CE is designed to serve.

Take-away Message: CEs are businesses which need to be run in business like ways. The disciplines of private investment and of results based compensation offered to capable CE management teams are important factors in determining their success or failure.

3.5. Rules-based Government Policies

Historical and contemporary evidence shows that effective commodity exchanges can develop in a variety of political contexts (Garcia and Leuthold 2004; UNCTAD 2009). Yet there is little evidence of commodity exchanges thriving in markets characterized by highly unpredictable and *ad hoc* forms of state intervention. While storable crops such as maize, wheat and soya are the most likely candidates to be traded on African commodity

⁸ In recent years several state sponsored exchanges have had to rely on non-competitive strategies, such as mandating that all exporters of specific high value commodities buy from them, this in order to create sufficient volume to justify their operations.

exchanges, some of these crops are highly politically sensitive. Governments typically feel compelled to keep staple food prices within politically tolerable ranges. However, if governments choose to influence food prices through marketing board operations, this tends to reduce the volumes that can be sold across the commodity exchange, contributing to the aforementioned problems associated with thinly traded exchanges.

Discretionary and *ad hoc* government operations in food markets are particularly anathema to the functioning of a commodity exchange. Discretionary forms of price manipulation create potential information asymmetries as to the actions of the marketing board or ministry responsible for announcing trade restrictions. Those with insider information as to impending policy changes can take advantageous positions on the exchange at the expense of less well-informed trading partners. Respondent interviews highlighted the particular case of a large international grain trader that was accumulating large maize stocks for release later in the season and was apparently unaware of the announcement of an export ban on maize, which immediately depressed market prices in Zambia, leading to substantial losses by the trader.

Together, these factors tend to drive farmers, financial institutions, and smaller traders away from the exchange and hamper the potential to develop a trade in forward contracts. This deprives the exchange of much needed volume and contributes to fears that the only actors using the exchange are doing so to influence the reference price. Thus, a vicious cycle emerges where thin spot markets undermine the credibility of the exchange, causing some market actors to opt out, which in turn makes the exchange more open to price manipulation. As a result, while commodity exchanges are theoretically designed to directly address issues of oligopolistic behaviors in commodity markets, under current conditions the result may in fact be the opposite. Fundamentally, therefore, the development of commodity exchanges in Africa will hinge on whether or not governments are willing to address their food security and poverty reduction objectives through predictable, rules-based forms of intervention in food markets.

In situations where governments maintain highly discretionary operations in staple food markets, an interim strategy for the development of commodity exchanges might entail including a basket of unregulated crops. The viability of this strategy would require that these crops allow for sufficient volume to be traded across the exchange to cover its operating costs and grow the system.

4. COUNTRY EXPERIENCE

This section updates prior country-specific analysis and reviews the current situation with regard to the status of agricultural commodity exchanges in Zambia, Malawi, and Ethiopia. These are the three countries where agricultural commodity exchanges have made the most progress, with the clear exception of South Africa, where the SAFEX exchange has thrived since its inception in 1995.⁹

4.1. Zambia

Sitko and Jayne (2012) identified five factors underlying the limited number transactions on the Zambian Agricultural Commodity Exchange (ZAMACE) floor since its inception: (1) the limited success in attracting financial institutions' commitment to commodity exchanges related to underlying structural problems of grain markets, namely frequent and unpredictable government interventions in grain markets; (2) the anonymous nature of trading on a commodity exchange, which exacerbated the risks faced by a market participant associated with contract non-compliance and opportunistic behavior by actors known to be unreliable; (3) the potential for conflict of interest among brokers, many of whom were also traders; (4) the potential for market manipulation in a thinly traded market; and (5) the high fixed costs that are imposed on actors trading in a thin market, which generates a vicious cycle of exit followed by the fixed costs being imposed on the smaller number of actors remaining loyal to trading on the exchange.

This section updates the current status of ZAMACE, with particular attention to its efforts since 2012 to address some of the underlying constraints identified by Sitko and Jayne (2012). This update is based on interviews with the current Managing Director of ZAMACE, as well as two major shareholders.

Assessments of ZAMACE's poor performance in terms of attracting sufficient volumes of trade prompted its shareholders to suspend trade on the exchange in 2012. Since the suspension of trade, ZAMACE shareholders have sought to restructure its ownership and brokerage services in ways that seek to address the factors limiting its performance identified by Sitko and Jayne (2012).

The key steps taken by ZAMACE shareholders since the suspension of trade are as follows. First, in an effort to address concerns raised by the commercial farming and grain processing sectors about the composition of ZAMACE's owners and brokerage services, which prior to 2012 were dominated by grain trading firms, ZAMACE shareholders voted to undergo a process of demutualization—i.e., the separation of the management of the exchange from the trading interests of the owners (UNCTAD 2009; Sitko and Jayne 2012). This entailed decreasing the ownership shares of the exchange's current owners to 20% and offering the remaining 80% to other institutions, including the Zambian National Farmers Union (ZNFU), the Lusaka Stock Exchange (LuSE), and other financial institutions. By so doing, the owners of ZAMACE seek to directly address industry concerns about potential conflicts of interest that existed when ZAMACE's only brokerage services were those of its owners, a few grain traders.

Efforts to encourage participation by commercial farmers and financial services in the exchange through their engagement as owners and brokers are aimed at addressing the

⁹ SAFEX is now owned and operated as part of the Johannesburg Stock Exchange (JSE).

concerns raised by Sitko and Jayne (2012) regarding the limited capacity of ZAMACE to attract sufficient volumes of trade from the commercial farming sector and limited participation by financial institutions. Prior to the demutualization process in 2012, ZNFU was reluctant to encourage its members to participate on the exchange for fear that existing brokers would not adequately advocate for the interest of farmers. Yet this appears to have changed. Demutualization combined with an increasing number of Zambia's commercial farmers having gained experience in selling crops to South Africa and Zimbabwe, where functional commodity exchanges exist or existed, has recently encouraged ZNFU to become a strong advocate for the development of ZAMACE. With ZNFU now actively promoting ZAMACE, more transactions from commercial farmers may be pushed over the exchange once it resumes operations.

However, policy uncertainty continues to plague Zambia's agricultural markets, particularly the actions of the Food Reserve Agency (FRA) and the government's tendency to impose export bans at short notice. This has made the resumption of trade on ZAMACE difficult and has prevented the development of formal ownership commitments from LuSE and other financial institutions. In particular, the Government of Zambia, through the Ministry of Agriculture (MAL) has been unwilling to sign a Statutory Instrument (SI) that allows for the implementation of the Agricultural Credit Act, a piece of legislation designed to enable the development and trade of warehouse receipts.

The Agricultural Credit Act, which was enacted in 2011, provides the foundation for the legal recognition of warehouse receipts for agricultural commodities as a form of security. However, implementation of the Act requires the creation of a Warehousing Authority, which will certify and license warehouses that issue receipts. It is the lack of a designated Warehousing Authority that has impeded the implementation of the Act, and has stymied the development of ZAMACE.

In the absence of a Warehousing Authority, any warehouse engaged in the testing and certification of agricultural commodities is acting illegally. Thus, without the creation of a Warehousing Authority, ZAMACE is unable to trade certified commodities through its warehouses and is unable to issue warehouse receipts. The creation of a Warehousing Authority is a relatively simple matter. In fact, stakeholders, including the Grain Traders Association and ZNFU, have helped to draft the SI needed for its creation and have developed a brief for the Minister of Agriculture on the implications of the SI. Despite broad support from the agricultural sector, the Minister has been unwilling to sign the SI. The political economy of this decision is unclear. One possible rationale is that certain segments of the grain economy benefit directly from the current opacity of the grain markets in Zambia, and would be hurt by the price discovery mechanisms created by a trade in warehouse receipts.

Indeed, while farmers and grain traders are actively supporting the restructuring of ZAMACE, the grain processors in Zambia have been unwilling to support the creation of an exchange. Historically, grain processors in Zambia have benefited from a strategic interaction with the government's Food Reserve Agency (FRA), which procures grain from small-scale farmers and off-loads it to processing firms at well below market prices. The development of a trading platform that enables price discovery works against processors, which have historically used uncertainty over prices and quantities to advocate for increased activity in the market by the FRA. Because the FRA is under the Ministry of Agriculture, and absorbs the largest share of the Ministry's budget, there are reasons to suspect that Ministry officials may also benefit from a large FRA presence created by an opaque grain market.

The effects of the Ministry's unwillingness to enact the Agricultural Credit Act have deeply impeded the development of ZAMACE. In the absence of a warehouse receipt system, LuSE and other financial institutions are unwilling to formally commit to ZAMACE. The draft agreement for LuSE's ownership share on ZAMACE is predicated on a functional warehouse receipt trading system. In particular, LuSE has agreed to provide ZAMACE with access to its Security Deposit Trading System and to handle depository side of a warehouse receipt trading platform as part of its ownership stake in ZAMACE. However, without a Warehousing Authority these functions cannot develop, which makes LuSE unwilling to formally commit to ZAMACE.

In addition to stifling the development of warehouse receipts, the lack of a warehousing authority prevents the trading of the Zambian maize contract, which has been approved to trade on the Johannesburg Stock Exchange (JSE). This contract is a US\$ contract of 10 mt of white maize, and has been approved by both the South African Reserve Bank and the Bank of Zambia. Despite uncertainty over delivery created by routine export bans on maize in Zambia, JSE is willing to trade these futures contract over their secure trading platform. Because this is a small quantity contract, denominated in US\$, it has the potential to enable groups of small-scale famers and traders, as well as large-scale producers to participate. This in turn would enable producers to hedge some production risk, and also could enable the access to production financing or cash through discounting of receipts on the contracts. It also enables farmers and traders to hedge positions in dollars.¹⁰ Yet, like ZAMACE's spot market, these futures contracts cannot be traded until delivery warehouses are certified under the Agricultural Credit Act.

Government inaction on allowing legal warehousing has prevented ZAMACE from reopening, limited the development of a more diversified ownership structure, and prevented the emergence of a Zambian futures contract. However, there are efforts within the grain industry to work around these impediments. In particular, the grain trading industry is in the process of developing a grain certificate, which builds on the existing industry practice of collateral management of grain stocks. The concept is that a selected group of grain traders will issue a certificate that stipulates the quantity, quality, and location of commodities in their warehouses. These certificates would be tradable within the industry. Announcing the value of trade in these grain certificates will help the industry to develop a more transparent system for generating a reference price and would enable the certificate to serve as collateral. In essence, these grain certificates would act as warehouse receipts within the industry. The goal of this strategy is to develop confidence within the sector in these certificates, which may then push the government towards formal recognition. Therefore, it would seem that the cooperation of many different interests within Zambia's grain marketing system are getting close to being in a position to create the conditions for a successful reintroduction of ZAMACE.

4.2. Malawi

Despite a relatively small agricultural commodity market, Malawi is home to three commodity exchanges vying for market share. These are the Agricultural Commodity Exchange for Africa (ACE), the Auction Holdings Commodity Exchange (AHCX), and the Malawi Agricultural Commodity Exchange (MACE). This section briefly reviews each of these exchanges and assesses their viability as self-sustaining trading platforms.

¹⁰ Trading in US\$ had been limited by Statutory Instrument 33 requiring all local transactions in Zambia to be conducted in Zambian kwacha, but this SI was revoked in 2014.

4.2.1. Agricultural Commodity Exchange for Africa (ACE)

ACE is Malawi's most developed commodity exchange. It began in 2005/06 and offers both spot and forward contracts. It does not trade in futures contract. Thus, all contracts traded on ACE require physical delivery of commodities either at the time of trade or at a specified future date.

ACE has a diversified shareholder structure that includes grain trading firms, food processors, and farmer's associations. This diversified ownership structure is beneficial in terms of building sector-wide confidence in the exchange. In other countries, commodity exchanges have struggled to gain the trust of potential participants due to ownership arrangements that are concentrated in the hands of one segment of the market, such as the trading sector (Sitko and Jayne 2012).

Unlike some African commodity exchanges, such as ECX in Ethiopia, ACE does not own warehousing infrastructure. Instead, it certifies privately owned warehouses, which are bonded and insured, and have the capacity to effectively grade commodities. In total ACE has 155,000 MT of certified storage capacity across the country. This arrangement enables ACE to keep its monthly operating costs substantially lower than exchanges that manage their own storage. This lower overhead enables ACE to achieve profitability through fewer transactions than is the case for exchanges that manage their own storage.

In addition to grading and storing commodities, three of ACE's certified storage facilities also issue warehouse receipts. Receipts issued from these facilities can be collateralized at three different banks in Malawi. These banks are First Merchant Bank, National Bank of Malawi, and Standard Bank. Warehouse receipts have enabled the development of forward contracts on agricultural commodities, where producers or processors are able to borrow against the underlying commodity at an interest rate of around 20%, nearly half the commercial lending rate in Malawi. In total, 8.5 billion Malawian kwacha (~\$20.4 million) has been traded in warehouse receipts, mostly for soya beans and sunflower. The concentration of warehouse receipt trade in these commodities likely reflects the relatively lower level of price uncertainty of these commodities, relative to more widely grown crops such as maize, which are frequently subject to unpredictable policy induced price movements.

ACE has benefitted significantly from donor investments aimed at supporting the development of the exchange and from trade in Bid Volume Only (BVO) contracts initiated by the World Food Programme (WFP) under its Purchase for Progress initiative. Donor-funded support for ACE includes \$635,000 from the EU to support the development of warehouse receipts and \$540,000 from AGRA to support farmer and trader sensitization. In total ACE has received approximately \$2 million in donor support since 2005.

BVO trade from WFP and some commercial processors has undoubtedly been the major factor driving trade across the ACE exchange. Since 2012 there have been 49 BVOs for maize and 47 BVOs for pulses, totaling 68,832 MT and 40,950 MT in respective volumes. In the absence of these BVOs it is unlikely that ACE would trade in sufficient volumes to remain viable.

That being said, trade in spot and forward contracts has grown over the years of ACE's operations. Trade in these contracts has increased as a result of several important factors. First, ACE does not require a minimum quantity on its contracts, which enables even small

volume producers to offer commodity for sale on the exchange. Second, ACE, with donor support, has invested heavily in sensitization campaigns aimed not only at producers, but also traders and processors. By contrast other exchanges, such as ZAMACE in Zambia, underspent on sensitization, which limited the extent to which the value of an exchange was appreciated in the market, even among more sophisticated market actors such as commercial farmers and large-scale processors (Sitko and Jayne 2012). Third, ACE has developed a network of seven market centers across the country where trades can be conducted. This enables producers and traders from across the country to participate. Finally, trade across ACE has benefitted from an improvement in the agricultural policy environment in Malawi that has contributed to increased predictability and a decreased role of the state in the market. In particular, due to financial constraints, Malawi's grain market board, ADMARC, has substantially curtailed its role in output market over the last few years. As Sitko and Jayne (2012) have shown, improved predictability of state action in food markets is a fundamental precondition to the development of commodity exchanges in Africa.

Since January 2013, ACE has conducted 854 spot and forward contract trades amounting to 83,206 MT of commodities. These trades are disaggregated by commodity type in the Table 1 below.

While this is a small fraction of the total volume of agricultural trade in Malawi, it does represent a moderate shift toward greater levels of formalization in the agricultural markets in the country.

In summary, ACE's success to date owes to four factors. First, it can rely on certified privately owned warehouses that are bonded, insured, and provide grading services. By doing so, ACE has been able to keep its operating costs substantially lower than exchanges that manage their own storage. Second, ACE benefits from experienced and dedicated management who have taken a number of innovative steps to increase participation on the exchange in its early days, such as not requiring a minimum quantity on its contracts and setting up numerous market centers in different parts of the country. Third, ACE has benefitted from the more limited role of the Malawian government in the maize market in recent years. Fourth, and very importantly, ACE has benefitted from the commitment of the WFP to use the exchange. Without the support of the WFP, which accounts for most of the trade across the exchange, it is not clear that ACE would be able to cover its costs or expand beyond its currently limited role in agricultural markets.

Table 1. Spot and Forward Contracts Traded on ACE January 2013 to March 2014

	Contracts	
	Number of transactions	Volume MT
Grains (Maize)	462	53,414
Beans (soya, kidney)	219	6,401
Pulses and sunflower	36	6,257
Groundnuts	11	88

Source: ACE website <http://www.aceafrica.org/market-info.aspx>.

4.2.2. AHCX (*Auction Holdings Commodity Exchange*)

AHCX was opened in 2013 by Auction Holdings Ltd. (AHL), which has traditionally provided the platform in Malawi for tobacco trading. The motivation for AHL to develop a commodity exchange is not entirely clear, given the fact that two other exchanges were already operating in the country when AHCX was opened. One respondent suggested that it is an effort to diversify the company's economic base away from tobacco as the global market for burley tobacco weakens. AHCX currently offers only spot contracts for the following agricultural commodities: i) non-GMO maize; ii) soybeans (grades 1 to 3); iii) groundnuts (high-protein or high-oil variety, grades 1 & 2); iv) rice (grades 1 and 2, all varieties); and v) sugar beans (red speckled beans, grades 1 and 2).¹¹ AHCX plans to trade forward options and futures contracts designed to manage trader and farmer risk.

Like ACE, AHCX provides a platform for trade in specified commodities of a designated quality through warehouse receipts. Like ACE, AHCX provides clearing facilities and arbitration for transactions conducted across the exchange. However, AHCX differs from ACE in some important respects. First, AHCX is fully owned by AHL and therefore does not have shareholder representation from a range of stakeholders and firms in the food system. While it does have trading members from various segments of the agricultural sector, these are not owner members with a vested interest in ensuring that the exchange functions effectively. Second, AHCX owns and operates all of its own storage facilities, similarly to ECX in Ethiopia. This has the advantage of allowing the exchange to maintain direct oversight over all aspects of the trading system, but also leads to very high monthly operating costs. These high costs must therefore either be spread across a large number of transactions or through high exchange commissions on those transactions that do occur on the exchange.

Third, AHCX appears to enjoy a good deal of political goodwill in Malawi. Indeed, the President, Vice President, and Minister of Agriculture and Food Security were all in attendance at the official launch of the exchange. This high level of political visibility may be the result of its relationship to AHL, which commands significant political power in Malawi given tobacco's role as a foreign exchange generator in the country. It is unclear how the relationship between policy-makers and AHCX will play out in practice, but one can envision an Ethiopian-type situation where certain commodities or actors are required to trade over the exchange if AHCX fails to generate organically sufficient trade levels. Finally, AHCX has yet to achieve the same buy-in from financial institutions as ACE to support the financing of warehouse receipts. Currently no financial institutions are listed as potential financiers of receipts on the AHCX website. This lack of support may reflect a wait and see attitude by the financial sector as it assesses the capacity of AHCX to manage the stocks underlying the warehouse receipts.

AHCX does not make available data on trade volumes. However, based on a reading of statements issued by the exchange and according to private interviews, AHCX has traded only 150 tons of maize since its inception. According to the Head of Operations for AHCX Davis Manyenje, AHCX has struggled to achieve sufficient supplies of commodities offered for trade on the exchange. This likely reflects a lack of investment into producer sensitization as well as limited interest from private traders to trade across the exchange.

¹¹ AHCX Web Site, see <http://www.ahcxmalawi.com/>

The exchange has been open for nine months and over that time it has sold only 150 tons of maize. However its impact on the business ecology, which supports farmers and small-scale traders in Malawi, has already been significant.¹²

4.2.3. Malawi Agricultural Commodity Exchange (MACE)

Though operational, MACE does not have specified contracts that it trades or a dispute resolution mechanism for transactions conducted across its platform. According to industry experts in Malawi, MACE is a commodity exchange in name only. In practice it operates more like a market information system.

4.3. Ethiopia

In their efforts to promote national markets for agricultural products, the pioneers who organized ECX had to overcome several daunting challenges. In the months following ECX's launch, maize, wheat, and beans were the primary traded commodities.¹³ However, at this time a food price crisis swept across Ethiopia. Domestic grain prices both on and off the exchange spiked amid rumors grew that exchange trading would cause further hikes. Trading on the ECX was nearly brought to a halt. This crisis in food grain trading accelerated ECX's push to introduce new commodities with more assured market liquidity and price stability. The exchange turned to coffee, an export commodity, which the exchange's management had planned to introduce in a later phase in any case, as well as to sesame seed, another important export commodity in Ethiopia. After intensive policy discussions on coffee, in July 2008 a law was passed to replace the legislation, which had governed Ethiopia's coffee auction since the 1960s. Henceforth, all Ethiopian coffee not directly exported by farmers would be traded not in the old auction, but rather on the Ethiopia Commodity Exchange.

It was not until 2010, that EXC returned to trading food grains in any significant volume when it negotiated an agreement with the World Food Programmed to buy maize through the exchange. The WFP is a major food buyer in Africa that normally dictates the terms of its purchases. However, the WFP had to bend its procurement policies in order to accommodate the non-tendered, open and transparent process of buying on an exchange-trading floor. In 2010 it made a promising restart with 6,000 tons of maize purchases.

Each decision to launch a new contract and thus enter a new commodity market is a strategic one, which affects the exchange in fundamental ways: in its revenues, in its political support, in its donor support and in the reputation and professional standing of its management. Vested interests in each new market needed to be dealt with explicitly.

According to a report by Whitehead (2013), "Critics argue that markets in Ethiopia are still heavily disjointed, and that smallholder farmers cannot access the exchange. The model

¹²In a recent press release the executive director of the exchange, Mr. Manyenje, stated that: "We are now seeing several financial institutions coming in to support farmers and traders with warehouse receipt financing on commodities other than tobacco, effectively spreading the benefits that tobacco farmers have long been benefiting to farmers of other crops. The same applies for other service providers that are now coming to offer production inputs, confident that the farmers now have a sustainable and assured market structure, where recoveries of lending is almost assured".

¹³ Gabre-Madhin (2011).

prevents traceability and is a poor market for highly differentiated products like coffee, which risk being standardized, they say. In London, the high-end coffee company Monmouth Coffee last year flagged up a concern with its Ethiopian offering: ‘As this coffee was bought and sold through the ECX, its traceability is limited... and full credit for the growing and preparation of the coffee cannot be given,’ it said in a promotional flyer. ‘We hope that at some stage in the future the Ethiopian coffee board will reconsider its current strategy and permit all coffees in Ethiopia to be traded directly.’

“Exchanges may make markets more efficient, but there is no differentiation, there is no sampling of the product, and the products traded are just not traceable,” argues Dirk Sickmuller, managing director of Taylor Winch Ltd, one of east Africa’s largest coffee brokers. “In this day and age the consumer wants to know what they are buying and where it has come from. In Kenya and Tanzania the coffees are fully traceable and we know exactly who is producing what, where, and when.” Whitehead (2013).

While it is sometimes argued that the ECX has promoted the welfare of coffee farmers as the value of exports has increased from \$529 million in 2007 when the exchange was established to \$797 million in 2012, others indicate that this rise can be almost totally explained by the increase in international coffee prices over this period. Moreover, recent analysis of ECX data indicate that the farmers’ share of the international coffee prices has not risen compared to pre-ECX farmer shares.¹⁴ ECX has apparently been unwilling to publicly share its data on prices received by farmers until quite recently, and has not accepted invitations by IFPRI and Oxford to carry out impact assessments on the ECX’s activities. Clearly more detailed assessments are necessary to understand how the ECX has affected the welfare of Ethiopian coffee producers.

In summary, Table 2 presents the status of all of the major commodity exchanges initiated in Sub-Saharan Africa in the past several decades and their current status. Three exchanges (SAFEX, ECX, and MACE) remain operational but only SAFEX is clearly sustainable and thriving based on the voluntary participation of all relevant market participants, and without significant external donor funding to sustain its operations. SAFEX’s unique situation is due in large part to its being able to satisfy the conditions all of the preconditions specified in Section 3.

¹⁴ For example, data from the International Coffee Organization indicates that farmers took home 51.6% of the export price of their product for the year ended September 2012, down from 57.1% in the year ended September 2007, before the exchange was established.

Table 2. Key Features of Selected Commodity Exchanges in Africa (Continued on next two pages.)

Name	Country	Established	Commodities traded	Contract type	Ownership	Status	Success Factors	Challenges
SAFEX	South Africa	1996	White Maize and Wheat	Futures and Stock Contract	Public-private	Operational	<ul style="list-style-type: none"> ✓ High level of trust among participants ✓ Benign and constructive government role ✓ Better infrastructure 	<ul style="list-style-type: none"> ✓ Mindset gap ✓ High price volatility
ECX	Ethiopia	2008	Coffee, Sesame and Beans	Warehouse receipts, Spot Contracts	Public-private	Operational	<ul style="list-style-type: none"> ✓ Strong government support – including banning coffee trade outside of ECX ✓ Reliable clearing system 	<ul style="list-style-type: none"> ✓ Poor infrastructure conditions ✓ Hostile response by some actors after the banning of private trade ✓ Inability to differentiate coffee on the basis of quality
ASCE	Nigeria	2001	Cotton, Cassava, Coffee, Ginger, Sesame	Stock exchange and warehouse Receipts	Public	Failed	Not applicable	<ul style="list-style-type: none"> ✓ Low volume of trade, ✓ Lack of transparency; and poor links with financial institutions.
KACE	Kenya	1997	Agricultural products	Future contract	Private	Failed	Not applicable	<ul style="list-style-type: none"> ✓ Small-scale structure of farmers ✓ Underdeveloped

Name	Country	Established	Commodities traded	Contract type	Ownership	Status	Success Factors	Challenges
UCE	Uganda	2002	Coffee, Sesame, Maize, Beans and Soya Beans	Warehouse Receipts	Private	Failed as an exchange – now modified to provide price information	Not applicable	✓ Low trade volume infrastructure
ACE	Zimbabwe	1994	Maize	Spot and Forward contract	Public	Failed	Not applicable	✓ Macroeconomic instability ✓ Unable to attract participant ✓ Poorly designed policy
ZAMACE	Zambia	1994	Maize, Wheat and Soya beans	Spot and Forward contract	Private	Failed	Not applicable	✓ Government policies restricting volumes traded across the exchange ✓ Government policies resulting in farm prices higher than prices to millers, effectively

Name	Country	Established	Commodities traded	Contract type	Ownership	Status	Success Factors	Challenges
								destroying incentives for private trade
ACE	Malawi	2004	Rice, Wheat, Beans, Ground Nuts, Peas	Forward Contracts, Warehouse Receipts	Private	Operational	<ul style="list-style-type: none"> ✓ WFP commitment to buy on the exchange ✓ Streamlined cost structure ✓ Offering contracts of small quantities to encourage more participants 	<ul style="list-style-type: none"> ✓ Lack of investments in infrastructure ✓ Small size of local markets

Source: The authors thank Shahid Rashid of IFPRI for sharing this table for inclusion in this report. Information in the table is derived from UNCTAD 2009; and from Rashid, Winter-Nelson, and Garcia 2010.

5. DO GOVERNMENTS REALLY WANT COMMODITY EXCHANGES?

While there is a widespread interest among the donor community and elements of the private sector in promoting agricultural commodity exchanges, can we say the same for governments? Does the development of a commodity exchange require that government agrees to impose certain constraints on its own behavior? Or can vibrant commodity exchanges develop under a wide range of government actions in markets, including the continuation of highly unpredictable operations in domestic markets and trade policies?

In east and southern Africa, maize, wheat, and soybeans are the most likely candidates for trade on a commodity exchange given their relatively high trade volumes compared to other crops grown in the region. However, governments in the region regularly intervene in cereal markets in an effort to support producer prices and/or reduce consumer prices in the event of price spikes.¹⁵ It is widely viewed in the region that governments are responsible for ensuring adequate food supplies at tolerable prices, hence the extremely politicized nature of maize policy in the region (Jayne 2012). Rashid, Winter-Nelson, and Garcia (2010) argue that by their nature commodity exchanges cannot guarantee that prices will remain within a range that is acceptable to policy makers. As such, there is a strong likelihood that governments will continue to intervene in cereal markets even if commodity exchanges were operating efficiently. For reasons indicated earlier, if the government's intervention is large, it can destroy market confidence and undermine the development of an exchange.

Government interventions in staple food markets affect the development of commodity exchanges in three primary ways. First, the potential to sell maize to the state at above market prices limits the incentive for farmers to sell their maize to marketing actors that might otherwise use the exchange. This drastically reduces the potential volume of trade across the exchange and the number of participants who would use it. Second, import and export bans, and the release of stocks on the market at concessionary prices, provide information advantages to marketing firms with insider knowledge of impending government action and the effects that such action will have on prices. Traders and millers with no particular insider knowledge are discouraged from taking forward positions on the exchange, thus depressing potential volumes of trade on the exchange. As a corollary, this unpredictability also limits incentives to store grain and invest in new storage facilities, which are both critical for the development of a functional spot market let alone a viable commodity exchange.

For these reasons government action can make or break the development of commodity exchanges. While politicians may truly support the development of an exchange, they may not be aware of how state actions can indirectly undermine them. This is not to say that governments must cease to intervene in food markets in order for commodity exchanges to function. In Brazil, for example, the Bolsa de Mercadorias e Futuros (BM&F) exchange actually provides a platform for government to meet some of its social objectives in food markets by facilitating grain procurement from smallholders (UNCTAD 2009). As long as it does not introduce major unpredictability into the market or divert a large portion of the marketed surplus from trading across the exchange, government interventions *per se* is not incompatible with commodity exchange development. Rather, it is *ad hoc* and unpredictable forms of state intervention that tend to stifle the development of commodity exchanges.

¹⁵ This intervention takes the form of parastatal and quasi-state procurement and sales operations in some cases and more commonly in the form of trade restrictions, such as variable import tariff rates or *ad hoc* export bans.

6. CONCLUSIONS

African governments and development partners have had a longstanding interest in considering the potential role of agricultural commodity exchanges. However, there has been an especially strong gust of support for agricultural commodity exchanges since the mid-2000s based on a perception – partially popularized by some development organizations’ programs to promote *structured trading* – that agricultural commodity exchanges could impose order and stability on staple food market to provide a more level playing field for smallholder farmers and provide market-based solutions to the problems of price risks. These perceptions soon materialized into numerous donor-supported projects to create agricultural commodity exchanges in Africa.

Unfortunately, these perceptions were in many cases based on questionable premises and unrealistic expectations of the benefits that well-functioning commodity exchanges could be expected to achieve. Commodity exchanges do have great potential to improve the efficiency of agricultural markets in Africa, but they should be viewed as a natural expansion and evolution of functioning spot markets, not a silver bullet that can by themselves overcome the underlying problems plaguing Africa’s staple food markets. Moreover, most commodity exchange promotion programs in Africa have almost all ended in failure because of an inadequate appreciation of the necessary preconditions required of the market before exchanges could be expected to function effectively.

If the underlying spot markets can be sufficiently developed, commodity exchanges can reduce the costs and risks of exchange – primarily among the larger market actors such as wholesalers, millers and food relief agencies – and indirectly reduce marketing costs for farmers if the market is sufficiently competitive. Commodity exchanges by themselves can confer little or no benefit in terms of access to farmer credit, especially for small-scale farmers, support for profitable new farm technology adoption, improved market access, or the reduction of price volatility. These problems can, however, be relieved to some extent through a holistic program of value chain development, government investments in physical infrastructure and a policy environment that promotes competition in the market and provides incentives for private investment in storage, transport, and the provision of financial services in support of smallholder production. Commodity exchanges are a part of such a holistic market development program.

There are at least five conditions that are highly favorable for the development of commodity exchanges. First, there must be a reasonably well-functioning spot market with many buyers and sellers and sufficient volumes traded to ensure against potential market manipulation by large actors. All countries where commodity exchanges have survived the test of time had enabling environments supportive of spot market transactions, buy-in and participation from the financial/banking sector, and a threshold level of private storage, transport, certification, collateral management services and the like. The buy-in of the financial system is particularly important. Commercial banks must be able to complete the transfer of payments between buyers and sellers rapidly and they must be willing to hold collateral in CE contracts against term loans and even against capital loans. This, of course, requires a reasonably effective regulatory environment.

Second, there must be sufficient volume of trade in the markets to cover the fixed costs of implementing a commodity exchange. Given that the volume of trade in many national markets is relatively small, policies that promote regional trade are likely to be critical for the viability of an exchange in many cases.

Third, commodity exchanges require a range of ancillary marketing services such as warehouse certification, collateral management and bank settlement services. If banks and marketing actors are already providing these services, the costs of running an exchange are lower and the commodity exchange is more likely to succeed. If these services are not already in place, the commodity exchange must create these services itself, significantly adding to the costs of running the exchange or imposing greater costs of participation on those trading across the exchange. This is why our earlier estimate of the up-front costs of running a commodity exchange (\$5 million to \$15 million) may be somewhat higher than other estimates. The higher the costs imposed on those trading on the exchange, the more likely that some actors will exit from participation, thus contributing to lower volumes and a downward spiral of further exit from participation. Limited volumes and few firms participating on the exchange are warning signs of demise. Therefore, the commodity exchange should focus on delivering services that add value to market exchange and avoid imposing or passing along additional costs of market participants at least until the system has achieved several years of high trade volume involving many committed trading participants.

Fourth, commodity exchanges require governance structures and capable management that build broad trust and perceptions of even-handedness in the management of the exchange and resolution of conflicts between trading partners. Most African exchanges have been supported artificially by donor grants or by government prohibitions on all other kinds of trade. The management teams tasked with starting up new *CEs* need to possess sufficient flexibility and authority under their corporate charters to take decisive action, to invest in new service capabilities when appropriate and to borrow money if required to realize their full competitive advantage. Success requires that *CE* management be motivated to work within hard budget constraints, to maximize the value they create and to generate sufficient profit to attract new investors. The quality of the management team and their experience with business process “best practices” are equally important.

Lastly, predictable and stable government marketing and trade policies are crucial. Commodity exchanges can operate within a policy framework in which the government influences food prices through transparent rules-based threshold prices that trigger pre-specified actions in the market. However, commodity exchanges cannot thrive where governments use highly discretionary and ad hoc mechanisms that create sudden changes in food prices (e.g., export bans, sudden changes in import tariff rates, unanticipated stock releases onto markets, or sudden changes in marketing board buying campaigns and procurement prices). These policies tend to reduce the volume of product available for trading across the exchange and also create the potential for “front-running”, i.e., taking a trading position based on insider information of impending government actions in markets, both of which greatly dampen the prospects for a viable commodity exchange. In cases where the government prefers a marketing system where it determines commodity prices then not only is there no need for a commodity exchange, it is also an inappropriate market institution in such a setting.

The experience of successful commodity exchanges underscores the importance of achieving sufficient market size – both in terms of the number of participants and the overall volume of trade – for sustainability. Sufficient market size is necessary for achieving the competitive conditions that foster price discovery. High trade volumes also allow the fixed costs of operating the exchange to be spread over a large number of transactions and participants, thereby imposing lower costs on market participants trading across the exchange. Finally, sufficient market size reduces the risk of market manipulation and collusion among market actors. Because of the fundamental importance of achieving adequate market size, sustainable

commodity exchanges are rarely, if ever, thinly traded. In the absence of external support, commodity exchanges either grow quickly into heavily traded institutions or they fail.

A challenge for a number of markets that have established commodity exchanges is to find a sustainable funding source or a viable revenue generating model. Due to the impediments mentioned above trade through the exchange can remain limited and since most revenue models are linked to trading activity, this remains a key challenge for the exchange to grow their revenues. Many commodity exchanges have proposed further diversification of the revenue model through applying annual membership fees, charging for data and providing grading and quality inspection services to complement the revenue from trading activity. The challenge remains that for the exchange to be sustainable it needs to provide services that market actors are willing to pay for.

Lastly, successful commodity exchanges that have stood the test of time evolved organically, not imposed on market actors by governments or their development partners, as has been the case in some African countries. A commodity exchange does not have a right to exist but rather must prove that it can add value to the market place. This can only be demonstrated if participation on the exchange is voluntary.

A common theme of our review is that commodity exchanges should not be viewed as panaceas for rectifying the many challenges facing African agricultural markets. While commodity exchanges can certainly improve the efficiency of markets on the continent, they cannot be expected to impose order on dysfunctional markets. Only once the major grain markets of the region achieve minimum threshold levels of policy stability will investment in commodity exchanges begin to contribute meaningfully to market performance and national food and agricultural policy objectives.

Based on these considerations, we conclude that donor investment in commodity exchanges is premature in many contexts and will face major difficulties in providing a decent return on investment until such time as the broader structural challenges facing African food markets are effectively addressed. Some of the indicators signaling readiness for investment in a commodity exchange would include (i) is there a competitive group of warehouse certification and collateral management firms in regional markets? (ii) is there a functioning inter-bank funds settlement system? (iii) is there a clear set of exchange rules and regulations to protect participants? (iv) is there a trusted and impartial legal framework for resolving disputes in a timely manner? And (v) is government committed to allowing market prices to choose their own levels based on supply and demand conditions perhaps within the bounds of pre-established floor and ceiling prices? Once these conditions are in place in regional spot markets, the probability that commodity exchanges could be successfully introduced and sustainable would be high.

However, there are interim measures that governments and development partners may take to nurture hospitable conditions for the sustainable development of agricultural commodity exchanges. Even where exchanges are not yet in place, interim measure would include supporting development of private warehouse certification services, collateral management, financial settlement, and industry arbitration/conflict resolution services, all of which are in demand even in vibrant spot markets. To the extent that these services are in place, the costs of subsequently setting up an exchange are much easier. Doing everything at once can be overly ambitious. Where fledgling commodity exchanges are in place, other interim measures to support their development in countries where some of the preconditions are not yet in place could include expanding or changing the range of commodities traded by the exchange

based on market assessments, issuing fairly low volume quantity contracts to enable a broader set of marketing actors to participate on the exchange (such as medium-scale traders and farmer organizations). In most countries, development partners could provide interim support by supporting public investments transportation and communications infrastructure to lower the physical costs of trade) while supporting efforts to achieve a more stable and predictable marketing and trade policy environment, e.g., through regional trade agreements.

Urbanization, consumer income growth, and higher world food prices are all providing major incentives for expanded investment in food production and in the value chains linking farmers to Africa's growing urban populations. With supportive food policies and public expenditures on market infrastructure, commodity exchanges can play a valuable role in supporting the transformation of African food systems – but as part of a more holistic program, not independently – based on the recognition that agricultural markets are components of a broader system. Constraints at other stages of the system will need to be identified and addressed in order for new commodity exchanges to achieve their potential. The nature of the constraints obviously varies by country according to their distinct policy, market, technology and agro-ecological conditions.

APPENDIX 1. AN EXPLANATION OF TERMS RELEVANT TO COMMODITY EXCHANGES

Term	Definition / description	Are commodity exchanges required for these services to be offered?
Spot markets	A spot market is one in which commodities are traded for immediate delivery. Failure to deliver traded products or failure to market cash payment within a limited time (one day) of the trade date are a sufficient cause for triggering penalties from qualified traders on spot markets.	Commodity exchanges (CEs) are not required for spot market pricing. However, well-functioning CEs do afford a low-risk venue for completing spot market transactions because of the bilateral transaction risk mitigation assurances that they provide.
Forward contracting	A contract for delivery in the future based on a mutually agreed reference price at the time of exchange. Forward contracting can usefully be contracted with spot contracting. If a spot contract is an agreement to sell or buy assets immediately, forward contracts are an agreement to buy or less contracts in the future. Trading in forward contracts affords the opportunity to buyers to assume a long position in an asset and a seller to assure a short position.	Forward contracts can be priced on any mutually agreeable expectation of future prices. Yet well-functioning CEs provide an effective reference for the creation, trading and low-risk transfer of forward contracts.
Hedging	<p>Hedging involves the assumption of a contractually committed liability <i>vis a vis</i> asset ownership in tradable future contracts which are intended to offset potential losses/gains that may be incurred by a companion investment. Hedging is used in trading strategies to reduce the risk of substantial losses/gains and to balance an investment portfolio in commodity investments based on diversification and upside/downside risk balancing.</p> <p>A hedge can be constructed from various types of financial instruments, including forward contracts, derivative products and futures contracts.</p>	CEs are the most effective venue for the creation, trading and low risk transfer of forward contracts and hence for the low cost execution of hedging strategies.

Term	Definition / description	Are commodity exchanges required for these services to be offered?
Futures trading	<p>A futures contract is a type of derivative instrument, i.e., a standardized market contract between two parties to buy or sell an asset of specified quantity and quality at a price agreed upon at the time that the contract is committed (the strike price) with delivery and payment occurring at a specified future date, the <i>delivery date</i>.</p> <p>On the delivery date, the amount exchanged is not the market price for the contract but the strike price (i.e., the original value agreed upon, since any gain or loss has already been previously settled by marking to market).</p>	<p>The purpose of the futures exchange institution is to act as intermediary and minimize the risk of default by either party. Thus the exchange requires both parties to put up an initial amount of cash (performance bond), or margin. Additionally, since the futures price will generally change daily, the difference in the prior agreed-upon price and the daily futures price is settled daily also (market margin). The exchange draws money from one party's margin account and puts it into the other's so that each party has the appropriate daily loss or profit. If the margin account goes below a certain value, a margin call is made and the account owner must replenish the margin account. This process is known as marking to market.</p>
Collateral management	<p>Collateral management involves the commitment of buyers on exchanges of valuable, liquid assets who convey contingent control of these assets to third party financial institutions to the benefit of sellers in order to assure payment of purchased contracts traded on commodity exchanges. Collateral management also entails the delivery of commodities of quality and quantity specified commodities (specified under the terms of traded contracts) to the control of third party warehousemen who take control of these commodities and deliver them to buyers as specified under the terms of exchange contracts.</p>	<p>Commodity exchanges are not required to deliver these services. Commodity management services, for example, are offered by specialized companies to assure that the terms of import/ export contracts are completed to the benefit of importers/ exporters and trade finance intermediaries consistent with the terms of export agreements.</p>
Bank settlement services	<p>Bank settlement services involve the management of post-trading, pre-settlement credit exposures to ensure that trades are settled in accordance with market rules, even if a buyer</p>	<p>Bank settlement services can be and frequently are customized to the requirements and specifications of various kinds of supply chains and of the</p>

Term	Definition / description	Are commodity exchanges required for these services to be offered?
	<p>or seller should become insolvent prior to settlement. Settlement services include cash management, transaction reporting/monitoring, risk margin management, netting of trades, tax handling, and failure handling. As cash payment intermediaries, banks assure that the promise of payment specified in traded contracts results in the actual movement of money from buyers' banks to sellers' banks.</p>	<p>structured trade which they entail. However, bank settlement services are essential for the efficient operation of commodity exchanges.</p>
Warehouse certification	<p>Public warehouses whose surety and quality assurance services are bonded and protected by third party insurers operate as agents of commodity exchanges in assuring that the quality and quantify terms of exchange traded commodities are fulfilled both when they take control of commodities from sellers and when they surrender control of the same commodities to buyers.</p>	<p>Warehouse certification services complement the needs of commodity exchanges to minimize transaction risk. Public warehousemen enforce and manage the commodity qualification terms of contracts traded on exchanges. They also assure that the quantities and qualities specified in those contracts are made good.</p>

Source: Authors.

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