
FOOD SECURITY RESEARCH PROJECT

**Constraints to the Development of Commodity
Exchanges in Africa: A Case Study of ZAMACE**

by

Nicholas J. Sitko and T.S. Jayne

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Any views expressed or remaining errors are solely the responsibility of the authors.

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EXECUTIVE SUMMARY

The development of agricultural commodity exchanges in Africa has become an increasingly popular strategy for addressing some of the ills plaguing African food markets, including poorly developed risk management systems, high transaction costs, and limited price discovery. However, despite substantial support from donors and, in some cases, national governments, commodity exchanges in most African countries are having difficulties getting off the ground. While previous studies (Rashid, Winter-Nelson, and Garcia 2010) highlight the fact that low trade volumes passing through African commodity exchanges limit their development, the question of *why* exchanges are thinly traded remains poorly understood. Using the Zambian Agricultural Commodity Exchange (ZAMACE) as a case study, this report identifies and explores six mutually reinforcing factors contributing to low trade volumes passing through ZAMACE. By analyzing why trade volumes and participation on ZAMACE have remained both low and erratic, this report seeks to provide policy makers and donors with greater clarity about the specific impediments to be overcome in developing commodity exchanges in the region.

Analysis is based on key informant interviews of large-scale farmers, traders, millers, ZAMACE brokers, representatives of the management of ZAMACE, and government officials in Zambia. The interviews took place in March 2011.

The first factor limiting ZAMACE's development is the high risk of contract non-compliance in Zambia, and poorly developed arrangements for addressing contract shirking and opportunistic behavior through the exchange. Due to the general weakness of Zambia's commercial laws, and the costs and time associated with enforcing contract compliance through Zambia's legal system, the movement of commodity prices up (down) frequently provides incentives for the seller (buyer) to wiggle out of the contract agreement. More effective and timely arbitration procedures and guaranteed settlement through a well-financed clearinghouse can reduce the transaction costs associated with resolving contract non-compliance, reduce the probability that contract non-compliance will occur, and therefore provide advantages for market participants to use the exchange. However, although ZAMACE has put in place both an arbitration process and a settlement guarantee facility, the cost of dispute resolution remains prohibitively high and time consuming. Market participants reported that the costs of pursuing dispute resolution through ZAMACE are often greater than the costs associated with having a trading partner back out of the contract agreement. As a result, two segments of the agricultural sector that could benefit greatly from using a commodity exchange, commercial farmers and medium scale grain wholesalers, usually opt to use traditional trading strategies with known buyers and sellers based on personal ties.

Traditional trading methods in Zambia rely on the cultivation of long-term relationships between buyers and sellers. These long-term relationships help buyers and sellers to significantly lower the risk of contract default. Conversely, commodity exchanges serve as anonymous trading platforms, and can therefore attract risky trading partners who may not be able to effectively trade if their identities were known. With the limited capacity of ZAMACE to ensure contract compliance and protect against default, the potential risks and transaction costs of using the exchange are significantly higher than traditional trading. This, in turn, deprives the exchange of trade volume and contributes its underdevelopment.

The second factor constraining trade on ZAMACE is the potential conflict of interest associated with traders acting as brokers on the exchange. Due to a general lack of brokerage services in Zambia, most registered brokers are also representatives of major grain trading

firms. Grain traders acting as brokers on ZAMACE represent a potentially serious conflict of interest, or at least the perception of one, which is equally important. Brokers working on the exchange are mandated to operate on a fixed commission. These commissions tend to be smaller than margins gained through conventional trading. Traders/brokers therefore have little or no incentive to encourage the commercial farmers or medium-scale wholesalers they interact with to push their commodities through the exchange. Instead, it is more profitable for them to negotiate trades directly with farmers and traders through the trading side of their business. Moreover, traders may stand to benefit from a trading system with a more opaque price discovery process. In a system where there is no transparent and widely accepted reference price, traders may have asymmetric information advantages and may be in a better position to stretch their trading margins. Until board members have a greater incentive to act as brokers rather than traders, their efforts to bring a wide range of grain sellers (traders and smaller traders) into the exchange will remain limited and trade volumes on the exchange will remain low.

The third factor has to do with the relationship between market thinness and the cost of participation on the exchange. The services provided by an exchange can be expensive. Fixed costs associated with the operation of an exchange include delivery guarantee services, communication systems, and employment costs of management and employees. Furthermore, variable costs are incurred such as contract enforcement, dispute resolution, and screening new participants for eligibility. In order for an exchange to be sustainable, these costs must be spread over a sufficient volume of trade. In the absence of market scale, the cost of operating an exchange per traded transaction will be prohibitive to some marketing actors and hence they opt out of the system, leaving fewer actors to shoulder the remaining fixed costs. Recently ZAMACE was forced to increase membership fees in order to cover the cost of operation, which has prompted some existing members to reassess whether the benefits of using the exchange are commensurate with the costs of participation. When members exit due to high participation costs, this deprives the exchange of trade volume and imposes greater costs on the participants that remain, thereby contributing to a vicious cycle of exit from participation on the commodity exchange.

The fourth factor is the relationship between market manipulation and market thinness. In the absence of a large market, commodity exchanges can become viewed as vulnerable to manipulation and price fixing rather than as institutions that provide transparent price discovery. This contributes to a vicious cycle in which thinly traded commodity exchanges create perceptions of potential price manipulation, which in turn causes more market participants to opt out of trading on the exchange, further exacerbating the problems of market thinness. The fear of market manipulation in already thinly traded markets is a fundamental constraint to ZAMACE achieving sufficient volumes of trade to become efficient and sustainable.

Market manipulation on a thinly traded exchange like ZAMACE can occur in two ways. First, with relatively few market participants' commodity reference prices, there is the perception that prices can be manipulated by buyers and sellers selectively using the exchange and selectively announcing their prices on the exchange. An accurate reference prices requires sufficient volumes of trade and sufficient competition between participants. In its current form, the ZAMACE reference price only reflects the prices that buyers and sellers are willing to make public. As such, processors, for example, may only wish to register trades that are on the low end of their price spectrum, in the hope that this price becomes the new reference price, effectively pushing down prices. Sixty-eight percent of the total traded value registered on ZAMACE occurred off the exchange, with trades selectively registered by

buyers or sellers. This behavior indicates that millers and traders believe that their own actions can influence the prices quoted on the exchange, which may actually be the case in a thinly traded market. Second, given the relatively small number of brokers participating on the exchange, most of whom are representatives of grain trading firms, the exchange can serve as a forum for traders to negotiate amongst each other to set prices, rather than competitively bid on available lots. Thus, while commodity exchanges have been promoted in Africa to address concerns of oligopolistic behaviors in commodity markets, under current conditions the result may in fact be the opposite.

The fifth factor concerns the inability thus far to nurture financial institutions' commitment to the exchange. To date, commercial banks in Zambia have not leveraged their growing position in the agricultural sector to encourage greater utilization of commodity exchanges. Aside from providing clearinghouse facilities, commercial banks and other financial institutions are in a unique position in the agricultural sector to encourage greater volumes of trade through commodity exchanges, either through advocacy to their clients or by financing their own brokerage seat on the exchange.

The sixth factor, which exacerbates all of the preceding ones, is the *ad hoc* and unpredictable nature of government intervention in commodity markets. The Zambian government frequently imposes trade bans, changes in import tariff rates, and the release and/or accumulation of stocks at prices very different from the market, all of which have major effects on market prices. This gives rise to concerns in the agricultural sector about asymmetric information on the government's intention in commodity markets. Market actors with insider information about impending government actions may be able to take advantage of those who do not. As a result, there is limited incentive for market actors who do not feel that they are especially plugged in to government decision making to take speculative positions in grain markets, which deprives the exchange of needed trade volume. Additionally, because government procurement and sales of grain tend not to be traded across the exchange, this further reduces ZAMACE's trade volumes, which prevents fixed costs of running the commodity exchange from being spread over much larger trade volumes.

Together these factors have stymied ZAMACE's development. Furthermore, the constraints identified through this case study are not isolated to Zambia, but speak more broadly to the potential for commodity exchanges to develop throughout Sub-Saharan Africa. Making commodity exchanges work in the context of African food markets is not merely a matter of providing adequate funding and developing appropriate institutions. By their very nature commodity exchanges are situated in the broader context of agricultural markets that are often characterized by inefficient legal systems, small spot markets, limited numbers of potential participants, passive financial institutions, vested political interests, and high levels of policy unpredictability. Thus, when assessing the feasibility of developing a robust commodity exchange, governments and donors must closely examine whether or not existing market conditions and political objectives are supportive of an exchange. The existence of one or more of the constraints identified in this report can lead to a vicious cycle of exchange under-utilization, opting out by potential participants, and eventual collapse of the exchange, regardless of the degree of financial support offered.

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ACRONYMS

FRA	Food Reserve Agency
FSRP	Zambia Food Security Research Project
IFPRI	International Food Policy Research
Mt	Metric Tons
SAFEX	South Africa's exchange
SEC	Security Exchange Commission
VAT	value added tax
WFP	World Food Program
ZAMACE	Zambian Agricultural Commodity Exchange
ZNFU	Zambian National Farmers' Union

1. BACKGROUND

Vibrant commodity exchanges play a major role in the development of an efficient agricultural marketing system. They are increasingly being promoted across Africa by governments and donors to improve the management of risks, reduce marketing costs, and provide transparent price discovery in food markets. Commodity exchanges are often viewed as a means for ameliorating many of the ills currently plaguing African agricultural markets, including:

- high price volatility and limited means for managing risks;
- oligopolistic market behavior and market collusion;
- limited formalization of contracts and quality standards, leading to frequent payment and delivery default;
- low levels of participation from smallholders in formal market channels; and
- high transaction costs throughout the system. By offering a platform for competitively matching buyers with sellers, commodity exchanges can stimulate both market transparency and price discovery.

As a result, collusion among market actors is limited, price volatility in the long-term can be decreased, and market actors and policy makers are provided with accurate price information to make informed decisions in food markets. At the same time, exchanges can reduce transaction costs by expanding the range of potential trading partners, providing industry approved inspection and quality certification services, providing contract enforcement and arbitration services, and fostering linkages between a wide spectrum of buyers and sellers.

Despite these potential benefits and substantial donor support, commodity markets in Eastern and Southern Africa remain underdeveloped. Rashid, Winter-Nelson, and Garcia (2010) identify three primary constraints to the development of vibrant commodity exchanges in the region: (i) market size; (ii) weak infrastructure and underdeveloped financial services; and (iii) lack of supportive legal and regulatory frameworks. As a result of these constraints, they argue, commodity exchanges have not lived up to expectations anywhere in Sub-Saharan Africa, apart from South Africa.

However, the limited size of formalized food markets in Sub-Saharan Africa is better understood as a reflection of more fundamental issues that stymie the development of commodity exchanges in the region. These fundamental constraints include, but are not limited to, underdeveloped financial services and legal frameworks. Identifying the full range of impediments to the development of sustainable commodity exchanges in Sub-Saharan Africa is necessary for recalibrating donor expectations about the nature of the institutional development challenges and the feasibility of effectively addressing these challenges within project-based life cycles of uncertain duration. Furthermore, it is important to provide policy-makers with an objective assessment of the potential for sustained expansion of commodity exchanges' role in agricultural markets in the absence of significant change to the overarching agricultural policy environment.

This report 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. These points are illustrated through a case study of the Zambian Agricultural Commodity Exchange (ZAMACE). To achieve these objectives, we interviewed 15 farmers, traders, brokers, and millers in Zambia who have either transacted on ZAMACE before, or who have invested

resources in considering whether to do so but who have not yet utilized the exchange. While some of the issues identified in this section are specific to Zambia, others speak broadly to challenges faced throughout the region.

In this report, we argue that the three problems limiting the development of commodity exchanges as identified by Rashid, Winter-Nelson, and Garcia (2010) reflect a number of underlying conditions of agricultural markets in the region. By identifying these underlying conditions, this report clarifies the political dilemmas and trade-offs associated with the development of commodity exchanges and the changes in policy direction required before it is feasible to consider commodity exchanges as an institutional innovation capable of transforming African food markets.

2. FACTORS IMPEDING THE USE OF THE ZAMACE COMMODITY EXCHANGE

Achieving sufficient market size, both in terms of volume of trade and number of participants, is a fundamental precondition for any commodity exchange to function effectively. There are a variety of reasons for this. First, sufficient market size is necessary for achieving the competitive conditions that foster price discovery. Second, high trade volumes allow the fixed costs of operating the exchange to be spread over a large number of transactions and participants. Finally, sufficient market size helps to reduce 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. Commodity exchanges either grow quickly into heavily traded institutions or they fail.

As with most exchanges in the region, ZAMACE has been unable to achieve the necessary market size to function efficiently or sustainably. Indeed, when comparing traded volumes on ZAMACE to a better developed exchange, like South Africa's exchange (SAFEX), the differences are glaring. A single day of trade activity on SAFEX is normally valued at over US\$100 million, while ZAMACE has only reported a total of US\$72.2 million since its inception in 2008 through the fourth quarter of 2010. Furthermore, ZAMACE's trade figures are misleading, because only 32% of the value of all trades actually occurred across the exchange. The remaining 68% of all traded value occurred off the exchange, directly between buyer and sellers, with the prices registered with ZAMACE only after the transaction took place.

The thinness of the ZAMACE market is not simply the result of the smaller size of Zambia's agricultural market relative to South Africa. According to interviewed members of ZAMACE, only between 2-5% of their firms' commodity trades are actually registered on the exchange, while the majority of non-members do not use the exchange at all. There is significant scope for achieving far greater trade volumes across ZAMACE than are currently being recorded. While a lack of sufficient market size severely limits the effectiveness of ZAMACE, market thinness is better understood as a consequence of more fundamental issues affecting the performance of grain markets in Zambia more broadly. This section analyzes the fundamental constraints to achieving sufficient market size on ZAMACE.

We identify six main factors impeding volumes traded on the ZAMACE exchange. First, Zambia's commodity markets are characterized by a high degree of risk and uncertainty associated with contract non-compliance, shirking, and opportunistic behaviors by some actors. Under these conditions, the exchange's inability to overcome the transaction costs related to contract enforcement limits the participation of many potential buyers and sellers, principally commercial farmers and medium-scale grain wholesalers. Furthermore, as we argue in section 2.1, the anonymity of an exchange – which contributes to enhanced performance in more developed systems – actually works against ZAMACE when the transaction costs of contract disputes are high.

Second, there are very few true commodity brokers in Zambia due to weak incentives to invest in the creation of brokerage firms. The majority of brokers registered to trade on ZAMACE currently wear two hats: as brokers and as grain traders. This presents a possible conflict of interest, and is perceived by many in the industry as a source of potential price fixing and collusion. Is the broker truly acting as a broker, trying to get the highest price for the farmer, or is he actually trying to buy low from the farmer in order to maximize profits?

This uncertainty in the eyes of many farmers limits farmers' and farmer groups' participation on the exchange.

The third factor is that thinly traded markets increase the cost of participation relative to traditional trading systems. All commodity exchanges incur fixed costs for their operation. When the exchange becomes thinly traded, then the fixed costs of the exchange must be shouldered by the few participants committed to trading on the exchange. As the costs of participation on the exchange rise, this creates further disincentives to participate among those deriving the least benefits from the commodity exchange, leading for additional exit from the system, until its eventual collapse.

The fourth central factor is related to market participant's perceptions that because of market thinness, individual actions on the exchange can move prices. This leads to selective participation on the exchange, selective price reporting by brokers, and leaves open the possibility that commodity reference prices can be manipulated. This in turn contributes to market thinness in a reinforcing vicious cycle.

The fifth factor concerns the inability thus far to develop financial institutions' commitment to the exchange. Despite the expanding agricultural lending portfolios of many commercial banks and their reliance on the reference prices generated by the exchange when negotiating lending terms, banks have not actively participated in the exchange as brokers or encouraged their clients to use the exchange when selling or procuring commodities. This amounts to a show of "no confidence" in the exchanges by the financial sector because of many of the factors discussed so far.

The sixth factor, which exacerbates all of the preceding ones, is the *ad hoc* and unpredictable nature of government intervention in commodity markets. The Zambian government frequently imposes trade bans, changes in import tariff rates, and the release and/or accumulation of stocks at prices very different from the market, all of which have major effects on market prices. This gives rise to concerns in the agricultural sector about asymmetric information regarding the government's intentions in commodity markets. A second and equally important dimension of heavy government operation in markets is that its activities usually divert large volumes of grain from being exchanged across the exchange. This factor will be addressed separately in section 3, but its role in contributing to the five preceding factors discussed in this section must be borne in mind.

These six fundamental factors are now discussed in more detail.

2.1. High Risk of Contract Non-Compliance and Poorly Developed Arrangements for Addressing Contract Shirking and Opportunistic Behavior

One of the defining characteristics of agricultural commodity markets in Zambia is the high levels of risk and uncertainty associated with contract default, including delivery and payment failure. Due to the general weakness of Zambia's commercial laws, and the costs and time associated with enforcing contract compliance through Zambia's legal system, the movement of commodity prices frequently leads to contract non-compliance. Through efficient and effective arbitration procedures, the consistent enforcement of contracts, and guaranteed settlement through a well-financed clearinghouses commodity exchanges can induce significant advances in the efficiency of commodity markets and lower the transaction costs associated with contract non-compliance. Indeed, in a physical market such as ZAMACE one of the greatest values of using the exchange is the security that a trade

conducted on the exchange is backed by financial and legal resources that insure buyers and sellers from payment default and delivery default. However, although ZAMACE has put in place an arbitration process and a settlement guarantee facility, the cost of dispute resolution remains prohibitively high and time consuming.

2.1.1. ZAMACE Arbitration

Currently, ZAMACE arbitration is not conducted in-house, but instead relies on the Zambian Arbitration Association, which is part of the Zambian Legal Association. There is a perception among some members that ZAMACE arbitration is long and extremely costly. This perception is the result of one particular arbitration case, which took approximately a year to reach a resolution and, according to people involved in the case, cost each party approximately US\$ 20,000. Because there have been only two arbitrations on ZAMACE in its short history, this one very long and costly arbitration set a bad precedent and shaped the perception among many potential and current users of ZAMACE that the exchange lacks the institutional capacity to guarantee its trades. Under conditions of long and costly arbitration, there is little or no incentive to bring a transaction dispute to arbitration because in many cases the profit from the transaction will not exceed the cost of arbitration. In essence, the cost and time associated with arbitration is only justified for large trades. This means that, in the absence of a well-financed clearinghouse, small trades across the exchange have little or no recourse for compensation from a default. The time and costliness of arbitration on ZAMACE is identified by several respondents as the primary cause for their limited use of the exchange.

While there is scope for improving ZAMACE's internal arbitration procedures, the effectiveness of arbitration ultimately depends on a country's commercial law. As widely acknowledged by respondents, contract disputes that reach Zambian courts can take years to be resolved. In this context, it is difficult to ensure the integrity of trades across ZAMACE, which in turn severely limits the value of using the exchange for market participants. Thus, transaction costs associated with ZAMACE arbitration, and the weakness of Zambian commercial law, fundamentally contribute to the problem of market thinness, which in turn undermines the sustainability and effectiveness of ZAMACE as a trading platform.

2.1.2. Clearing Facilities and Settlement Guarantee on ZAMACE

For commodity exchanges to be effective, they must have access to clearinghouse facilities with sufficient capital to serve as a guarantor of all transactions (Rashid, Winter-Nelson, and Garcia 2010: 11). The development of clearinghouses to ensure the delivery of product in the face of potential contract default and costs associated with drawn out arbitration can greatly reduce the risks of transacting on the exchange. Indeed, effective settlement guarantee may be the most important way for ZAMACE to become relevant in a market that is dominated by high incidences of default in the face of price movements.

ZAMACE has recently negotiated terms with Standard Chartered Bank, in conjunction with Africa Trade Insurance, to develop a settlement guarantee facility to serve as a guarantor of transactions. This is not, however, a clearinghouse. Because many of the transactions listed on ZAMACE do not pass through the exchange, it was decided that ZAMACE will not take

responsibility for the clearance of each transaction, but rather will maintain an oversight of payment and delivery against contracts to ensure compliance.

However, to date no brokers have opened a brokerage account with the settlement bank. Currently, the use of the settlement guarantee is not mandatory for brokers and brokers have not voluntarily bought into the settlement account. In part, the lack of buy-in to the settlement guarantee facility is a reflection of the limited institutional capacity of ZAMACE to bring punitive measures against defaulting brokers. Paying 3.5%-4.5% interest on a settlement guarantee facility may not be justified in situations where arbitration procedures remain underdeveloped. Furthermore, the volumes of current transactions may not justify the cost of maintaining a guarantee facility. In this context, there is little incentive for brokers to voluntarily commit funds to a settlement guarantee facility. As a result, default risks associated with trade over ZAMACE are in all likelihood as high as default risks associated with traditional trading risks. This, in turn, limits the value to potential clients of paying to use a centralized exchange relative to traditional trading systems.

2.1.3. Effects of the Limited Capacity of ZAMACE to Ensure Contract Compliance on Market Size

While the institutional structures for addressing issues of contract compliance and shirking are in place at ZAMACE, they are under-utilized, inefficient, and fail to address some of the pressing needs of Zambian agricultural markets. Understanding how and why limited contract enforcement and underdeveloped settlement guarantee can limit participation and trade volumes on an exchange case is critical for assessing the feasibility of developing sustainable commodity exchanges in the region.

Relative to other actors in commodity markets, commercial farmers and medium-scale wholesalers (grain buyers that procure from small-scale farmers and village-level grain assemblers and sell to large-scale traders and processors) are in the best position to drive significant changes in the volumes of trade on commodity exchange in Zambia. There are multiple reasons for this:

1. Both commercial farmers and medium-scale wholesalers handle significant quantities of the total volume of marketed cereals in Zambia,
2. Both are already well connected to existing formal trading regimes, and
3. As sellers, both can theoretically derive significant benefits from the existence of a transparent and competitive exchange.

Thus, these actors have the capacity, incentives, and pre-existing institutional arrangements to effectively sell commodities across an exchange, thereby driving significant increases in volume. Despite these potential advantages, the participation of commercial farmers and medium-scale wholesalers on ZAMACE has thus far been limited by the perception of high transaction costs and risks of using the exchange compared to traditional trading systems.

The limited use of ZAMACE by commercial farmers and medium-scale wholesalers must be understood as the outcome of the risk mitigation strategies they deploy to protect against contract default and payment failure in the highly volatile market conditions that prevail in Zambia. In a market environment where there is little or no contract enforcement and high levels of price volatility, buyers can and do walk away from contracts or refuse to pay at the agreed upon price when prices move down. The inverse is also true, when prices move

upward farmers and traders may be unwilling to fulfill their contractual obligations at the agreed price. In Zambia, many buyers have experienced situations where they have been unable to acquire sufficient stocks to meet their demand due to a major delivery failure. Conversely, many grain sellers have experienced difficulties in liquidating their stocks because a buyer refused to pay at previously agreed upon price. Given that there is little legal recourse to protect against these sorts of contract defaults, commodity markets in Zambia have evolved in such a way that interpersonal relationships between buyer and seller have become of paramount importance in mitigating the risk of contract default. These relationships are critical for ensuring availability of supplies and protecting against severe price collapses in markets characterized by extreme policy and climate induced volatility and limited institutional development of contract enforcement mechanisms. These informal risk mitigation strategies are not well-suited to transparent and anonymous institutions such as commodity exchanges.

In Zambia, interpersonal market relationships between buyers and sellers may be cultivated in a number of ways. For example, traders or processors may provide pre-financing to farmers prior to the planting season or to medium-scale wholesalers prior to the marketing season. Buyers may also provide free or low-cost transport services to farmers and wholesalers. Alternatively, buyers may offer forward contracts to farmers where profits from upside price movement are shared, while all the downside price risk is assumed by the buyer. Buyers in Zambia are also willing to offer commercial farmers and medium-scale wholesalers prices that are slightly higher than the market price for a relatively abundant commodity, like maize, in the hopes that this will provide a foundation for them to acquire more scarce commodities, like soy or wheat when the need arises. Indeed, in some cases preferred farmers and wholesalers are regularly offered higher than market prices in an effort to maintain a long term relationship with them, which the buyer hopes they can capitalize on during deficit years. Buyers and sellers are less likely to default on a contract if that default would jeopardize a sellers' ability to sell commodities at remunerative prices during surplus years or a buyers' ability to attract sufficient grain in deficit years. As these examples suggest, Zambian grain trading is built upon a deeply social structure of inter-personal relationships between buyers and sellers, which is not well-suited to the anonymity and transparency of a centralized exchange. In the absence of effective and low-cost arbitration, contract enforcement mechanisms, and settlement guarantee facility, the importance of these risk mitigation strategies will always outweigh the potential benefits of price discovery offered by an exchange.

Furthermore, the ostensibly anonymous trading platform of ZAMACE can sometimes work against it. There is a fear within the farming and trading communities that the exchange may attract risky trading partners who would have difficulty negotiating an exchange if their identity were known. For example, politically well-connected individuals might be better able to back out of an agreement without adverse consequence to themselves. Such a person might not be considered an attractive trading partner if their identity were known to the other party, but such information would be hidden in transactions cleared through ZAMACE. There is a good deal of concern within the sector that an offer on ZAMACE may be won by someone who is notorious in the industry for defaulting on payments or delivery, and that if a default occurs they will not be adequately protected. Although ZAMACE has regulations and processes in place to protect clients from default, two drawn out arbitration cases have undermined confidence in its ability to actually enforce its contracts. Thus, the potential transaction costs associated with using an exchange may in fact be higher than traditional trading methods, since the anonymity of the exchange undermines the ability of buyers and sellers to deploy their traditional risk mitigation strategies. Under these conditions farmers

and wholesalers find it safer to sell to a known buyer with whom they have a relationship, rather than risk the uncertainty of an anonymous exchange.

While the anonymous nature of the exchange induces a certain level of uncertainty and risk, the highly concentrated nature of agricultural markets in Zambia makes it extremely difficult for large-scale buyers to act anonymously. This is of particular importance to grain processors, who have been unwilling to actively participate on the exchange out of fear that the prices they offer and the quantities they have bought will become publicly known. Processors in Zambia thrive on relatively opaque markets, which allow them to blend down the high prices they pay to their preferred producers and traders with lower prices from less well connected and savvy sellers. Under these conditions, where the anonymity of the exchange is questionable for larger buyers and where investments in long-term trading relationships may not be well suited to an open and transparent market, the participation of processors on an exchange will always be tempered. This, in turn, has significant consequences for the participation of medium-scale wholesalers and commercial farmers. Without the active participation of processors, many farmers and medium-scale traders are reluctant to use ZAMACE, because, in the absence of significant cross border trade, processors tend to be the end buyers in Zambian commodity markets. With primarily large-scale traders buying on the exchange, most of whom simply conduct back-to-back trades, farmers and medium-scale wholesalers rightly question whether prices available on ZAMACE are actually the best prices available on the market. This, again, acts as a disincentive to their participation on the exchange.

The main conclusion from this section is that, while commodity exchanges are envisaged as institutions to aid in driving down transaction costs in African food markets, the actual and potential costs associated with adequately developing the formal institutions to ensure contract compliance through an exchange may, in fact, exceed the risk mitigation costs of traditional trading systems. Until the potentially high transaction costs associated with an anonymous exchange can be effectively lowered below the costs associated with traditional risk management strategies, commodity exchanges in Africa will fail to attract sufficient volumes of trade—from wholesalers, farmers, and processors—to become sustainable trading platforms.

2.2. Potential Conflict Associated with Traders Acting as Brokers on the Exchange

When ZAMACE was initially developed there were few true commodity brokers in the country. In the absence of true brokerage services, ZAMACE turned to existing trading firms and, to lesser extent processors, to comprise its board and to buy brokerage seats. At its inception, ZAMACE was founded by eight core members, most of whom were representatives of large-scale grain trading firms. While the number has grown to eleven, and now includes a few true brokers, ZAMACE's brokerage services are still predominately comprised of grain traders. In the beginning, these actors held certain advantages for the nascent exchange, such as experience with using exchanges in other countries, liquidity, and significant market knowledge. However, while these advantages may have been important in helping to develop the exchange, the predominance of grain traders serving as brokers on the exchange has become a liability, which contributes directly to the current thinness of the ZAMACE market and, subsequently, to its inability to become a sustainable and effective trading platform in Zambia.

Grain traders acting as brokers on ZAMACE present a potentially serious conflict of interest, or at least the perception of one, which is equally important. As brokers working on the exchange, they operate on a fixed commission. These commissions tend to be smaller than margins gained through conventional trading. Moreover, traders may stand to benefit from a more opaque trading system. In a system where there is no clear price discovery process, traders may be in the best position to stretch their trading margins. Under these conditions, a trader-broker has little or no incentive to encourage the commercial farmers or medium-scale wholesalers they interact with to route their commodities through the exchange. Instead, it is more profitable for them to negotiate trades directly with farmers and traders through the trading side of their business. Until board members have a greater incentive to act as brokers rather than traders, outreach to potential sellers on the benefits of using an exchange by board members will remain limited.

Furthermore, because so many of the brokers on ZAMACE are also grain traders, many commercial farmers and smaller traders believe that ZAMACE is not competitive, open to price collusion between members, and that brokers may not be acting in the best interest of their clients, but rather in the interest of the major trading firms they represent. Without the institutional capacity to prevent collusion and to sanction members, distrust of the exchange will continue to limit participation on the exchange.

Overcoming this binding constraint will require a combination of structural changes to ZAMACE and the agricultural market within which it operates. First, ZAMACE must identify and recruit to the exchange more true brokers having no vested interests in grain trading. These could include farmer's associations and financial institutions. However, in the absence of significant trade volumes passing through the exchange, there may be little incentive for a firm with wide connections in the market to stop operating as a trader in order to register as a brokerage firm on ZAMACE. Second, until trading margins decline to parity level with brokerage commission fees, trading firms with brokerage seats will remain hesitant to promote the exchange to their clients and advocate for more trade to pass through the exchange. Addressing this requires significant changes in the existing marketing system, including more predictable agricultural policies and lower cost risk management systems, which can help to narrow trading margins in the marketing system. Until the conditions are met for the development of true brokerage services commodity exchanges will struggle to achieve the necessary volumes of trade and number of participants to function effectively.

2.3. Market Thinness and Participation Costs

The services provided by an exchange can be expensive. Fixed costs associated with the operation of an exchange include delivery guarantee services, communication systems, and employment costs of management and employees. Furthermore, variable costs are incurred such as contract enforcement, dispute resolution, and screening new participants for eligibility (Rashid, Winter-Nelson, and Garcia 2010: 3). In order for an exchange to be sustainable these costs must be spread over a sufficient volume of trade. In the absence of market scale, the cost of operating an exchange per traded transaction will be prohibitive to some marketing actors and, hence, they opt out of the system, leaving fewer actors to shoulder the remaining fixed costs.

Aside from donor support, ZAMACE covers its costs of operations by charging a monthly membership fee to its members, charging for commodity testing and certification services, and collecting transaction fees of 0.15-0.2 % of the value of the trade conducted through

ZAMACE. The fee charged to a trade varies depending on whether the trade is conducted across the exchange or simply registered with the exchange. This transaction fee is charged to both parties involved. Yet, currently the total traded value passing through ZAMACE represents only a fraction of the total value of agricultural commodity trade in Zambia. As a result of the low traded volume and difficulties in covering the fixed costs of operating the exchange, ZAMACE recently raised its monthly membership fees by 25%. This fee increase has prompted a number of members to reconsider whether the costs associated with participation are justified by the benefits they derive from using ZAMACE.

If current members opt out of the exchange because of the elevated costs, then the burden of covering fixed costs will be passed down to those who decide to remain. However, this is not an issue that can be simply resolved by directing more donor money toward covering existing fixed costs. Opting out of the exchange because of the cost of participation can only be sustainably addressed by improving the benefits that members derive from their participation. This would include cost effective dispute resolution and settlement guarantee, thinner margins between brokerage fees and traditional trading margins, and, consequently, sufficient trade volumes on the exchange. When evaluating the feasibility of developing an exchange, policy-makers and donors must look closely at whether or not the cost of participating on the exchange is justifiable to a sufficient number of potential participants relative to the benefits they derive from participation. If this condition is not met, nascent commodity exchanges will quickly collapse as initial members opt out of the system and return to their traditional trading systems.

2.4. The Relationship between Market Manipulation and Market Thinness

A commodity is likely to be traded effectively on a centralized exchange only if a large spot market, in terms of value and number of participants, already exists (Rashid, Winter-Nelson, and Garcia 2010: 6). In the absence of a large market, commodity exchanges can become viewed as potential vehicles for facilitating market manipulation through price fixing, rather than as institutions that promote price discovery. This perception contributes to a vicious cycle in which relatively thinly traded markets create conditions for potential price manipulation, which, in turn, contributes directly to market participants opting out of using commodity exchanges. In Zambia fear of market manipulation in already thinly traded markets is a fundamental constraint to ZAMACE achieving sufficient volumes of trade to become efficient and sustainable.

In Zambia, the value of total trade volume is quite low, compared to countries such as South Africa and India. Of the three major cereal crops grown and traded in Zambia—maize, wheat, and soy—maize is the most widely grown, with production exceeding 2.5 million tons in 2009/10. Because of its already large spot market maize is the mostly likely candidate to be successfully traded on an exchange. However, as will be discussed in greater detail in section 3, government interventions in maize markets, which are both large in scale and highly unpredictable, severely hamper the potential for maize to be widely traded on the exchange. In the absence of significant trade volumes of maize, wheat and soy are the only two crops with significant production volumes that are well-suited to formalized trade on a centralized exchange.

Wheat production in Zambia is estimated to be less than 200,000 mt per year and soy roughly 90,000 mt. At the same time a small number of large buyers of wheat and soy make the pool of potential competitors quite small. For example, Zambeef alone has the processing capacity

to utilize roughly 60% of Zambia's soy crop, while National Milling Corporation requires 60,000 mt, or roughly 30%, of Zambia's wheat crop. These small volumes and limited number of major participants present serious challenges to the development of a centralized exchange, because fear of price fixing dissuades many potential participants from using the exchange to buy or sell grain.

Market manipulation on a thinly traded exchange like ZAMACE can occur in two ways. First, with relatively few market participants commodity reference prices can be easily manipulated by buyers and sellers selectively using the exchange and reporting transaction prices selectively on the exchange. An accurate reference price requires sufficient volumes of trade and sufficient competition between participants. In its current form, the ZAMACE reference price only reflects the prices that buyers and sellers are willing to make public. As such, processors, for example, may only wish to register trades that are on the low end of their price spectrum, in the hope that this price becomes the new reference price, thereby effectively pushing down prices. As was shown in the background section, 68% of the total traded value registered on ZAMACE occurred off the exchange, with trades selectively registered by buyers or sellers. This behavior indicates that millers and traders believe that their own actions can influence the prices quoted on the exchange, which may actually be the case in a thinly traded market. Second, given the relatively small number of brokers participating on the exchange, most of whom are representatives of grain trading firms, the exchange can serve as a forum for traders to negotiate amongst each other to set prices, rather than competitively bid on available lots. Thus, while commodity exchanges have been promoted in Africa to address concerns of oligopolistic behaviors in commodity markets, under current conditions the result may in fact be the opposite.

Achieving sufficient volumes of trade on an exchange in a market environment characterized by relatively small spot markets is a major challenge. This is not to say that, in the case of Zambia, there is insufficient productive capacity and total trade volume to support a sustainable exchange. Rather, because the markets are concentrated and relatively thinly traded, fear of market manipulation pushes much of the potential trade volume away from the exchange, making the exchange more thinly traded than would otherwise be the case. While there are opportunities for instituting reforms aimed at assuaging fears of market manipulation on the exchange, these reforms can only address the superficial causes of these anxieties. Ultimately for an exchange to be sustainable, far greater volumes of trade in crops with large spot markets, such as maize in eastern and southern Africa, must be achieved. However, this will require significant changes to the market and policy environment for important food crops, which, as will be discussed in more detail in section 3, may not be realistically achieved in the short-term.

2.5. Financial Services

Commercial banks in much of Africa have only recently begun to invest significant percentages of their lending portfolios in agriculture. As such, the ability of human capital within many local bank branches to understand the complexity of agricultural markets and potential ways of improving market efficiency for themselves and their clients may be limited. To date, commercial banks in Zambia have not leveraged their growing position in the agricultural sector to encourage greater utilization of commodity exchanges. Aside from providing clearinghouse facilities, commercial banks and other financial institutions are in a unique position in the agricultural sector to encourage greater volumes of trade through

commodity exchanges, either through advocacy to their clients or by financing their own brokerage seat on the exchange.

Currently, banks benefit from the existence of exchanges because the reference prices generated by the exchange are used in the negotiation of collateral management arrangements and production loans to commercial farmers. In essence, banks free-ride on the system without making any substantive contribution to the operation of the exchange. Because of their dependence on the ZAMACE reference price they have an incentive in ensuring the integrity of the price discovery process, which, as discussed in the previous section, may not actually be the case in thinly traded markets like ZAMACE.

Because of the benefits banks derive from functional commodity exchanges and accurate reference prices, sustained efforts to bring the banking sector into the exchange could help to drive growth in traded volumes. Theoretically, banks could use their considerable financial leverage over commercial farmers and processors to require them to use the exchange when buying or selling commodities. Alternatively, banks could open their own brokerage services for their clients to use, thereby addressing some of the issues related to current distrust in brokerage services and fear of market manipulation.

Identifying incentives for banks and other financial institutions to become active participants in the exchange, and working closely with them to articulate these incentives into concrete action on the exchange is crucial for the development of sustainable commodity exchanges in the region. However, working to improve bankers' understanding of how commodity exchanges function, and the potential benefits they can derive from more robustly traded exchanges, is only a partial solution to the problem of under-developed commodity exchanges in Africa. Ultimately, the incentives to use an exchange must be broadly shared throughout the agricultural and financial sectors in order for trade volumes to become sufficient for an exchange to function sustainably.

2.5.1. Futures Markets

The development of futures options, particularly for wheat and soy, may provide an opportunity to encourage greater trade volumes on ZAMACE, enroll more speculators onto the exchange, and thus bring the exchange much needed liquidity. However, the frequency with which the government intervenes in the regulation of food imports and exports raises the basis risk—the risk associated with differences between spot market and future market prices—to levels that may be intolerable to many hedgers, speculators, and other financial institutions. Furthermore, the weak legal framework for enforcing contracts, including costs and time, undermine the potential for a futures market to develop.

3. DO GOVERNMENTS REALLY WANT COMMODITY EXCHANGES?

Cereal crops, the mostly likely candidates for commodity exchanges in Africa, are extremely politically sensitive throughout the region. Due to this political sensitivity the government of Zambia, like other governments in the region, regularly intervenes in cereal markets in an effort to both support producer prices and/or to reduce consumer prices in the event of price spikes. 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. Although vibrant exchanges can help to minimize the risk of price variability over time, this does not necessarily equate to price stabilization. As such, there is a strong likelihood that government will continue to intervene in cereal markets even when commodity exchanges are operating efficiently. If the government's intervention is large, it can destroy market confidence and undermine the development of an exchange.

In Zambia government intervenes to varying degrees in all major cereal markets. The most significant of these is the maize market. Since 2002 the government has maintained an active role in maize procurement through the Food Reserve Agency (FRA). The FRA offers a pan-territorial price for smallholder maize that is well above prices available on the private market. Additionally, cross-border trade in maize is tightly regulated through the issuance of import/export licenses. The government also intervenes in consumer markets by releasing maize stocks onto the market at concessionary prices. Under these conditions it is difficult for ZAMACE to attract the necessary number of participants and trade volumes needed to develop the exchange and certainly constrains the use of ZAMACE by foreign players. Government interventions in the maize market affect the development of the exchange in three primary ways:

- First, the potential to sell maize to FRA at above market prices limits the incentive for smallholders to sell their maize to marketing actors that might use the exchange. This drastically reduces the potential volume of trade on the exchange and the number of participants who would use it.
- Second, import and export bans, as well as the release of stocks on the market at concessionary prices, discourage traders and millers with no particular insider knowledge of impending government actions from taking speculative positions in the maize market, which in turn decreases the potential volumes of trade on the exchange.
- Finally, the discretionary and unpredictable ways in which the government intervenes in the market makes the development of futures contracts for maize virtually impossible, since the basis risk far exceeds the risk profile of any hedger or speculator. This in turn deprives the market of potential liquidity.

Wheat and soy in Zambia are subject to fewer government interventions, although import and export bans are also sporadically imposed and removed. However, both are produced predominantly on commercial farms in Zambia, therefore encouraging trade volumes on the exchange would require greater participation from the commercial farming sector. As mentioned above, a number of issues hamper commercial farmers' participation on ZAMACE, including distrust of the brokerage services and the advantages they accrue from the current system of trading. In addition to these concerns, the value added tax (VAT) on wheat sales limits farmers' willingness to use the exchange to sell their commodities. Based on interviews with industry experts, many wheat farmers will negotiate with buyers to sell wheat off their books, thereby limiting the need to pay the 16% VAT on wheat. In a transparent market like ZAMACE this would not be possible. If the government of Zambia

wants to encouraging greater volumes of trade in wheat across ZAMACE it must consider changing the VAT on wheat sales.

Until government intervention in cereal markets become more transparent and predictable the development of a commodity exchange in Zambia will remain stunted. Furthermore, enrolling small-scale farmers into a centralized and formal commodity market will always be contingent on the scale of FRA involvement in maize procurement. Until small-scale farmers have an incentive to seek out the best market price for their commodities, rather than waiting for government to buy from them at above market prices, it will be difficult to achieve significant sales volumes from the smallholder sector. Indeed, in the absence of predictable, rules-based policies to guide government intervention in cereal markets, the possibility for commodity exchanges in Africa to achieve sufficient trade volumes to become sustainable and contribute meaningfully to market efficiency is highly unlikely.

3.1. Quality Standards and Government Policy

The standardization and certification of grain quality standards is another valuable function that exchanges can foster in African grain markets. Quality standards become a particularly important point of contention in African grain markets when there are large price movements. When prices move, disagreements over the quality of commodities delivered serve to justify payment default or price re-negotiation. Thus, by acting in the capacity of a disinterested and credible forum for defining standards and grading commodities, exchanges can provide valuable risk mitigation for both buyers and sellers. Indeed, the creation of industry-back standards is one of the most widely used and accepted contributions that ZAMACE has made to Zambia's agricultural market.

In market environments where trade does not account for quality-based price differences, the relevance of an exchange's quality certification services is substantially diminished. Because FRA procures maize from smallholders at pan-territorial prices, irrespective of quality, incentives to produce high quality maize are limited. If governments are committed to maintaining a presence in food markets through marketing board procurement, yet are at the same time interested in promoting commodity exchanges, then price premiums for quality difference need to be incorporated into their procurement procedures. In the absence of price incentives for quality differences, one of the fundamental contributes an exchange can make to African food markets is negated.

3.1.1. Disincentives to Grain Storage

Commodity exchanges like ZAMACE are physical exchanges built primarily around trade in cereal crops. As a result, the feasibility of developing the exchange is tied to the availability of high quality storage facilities capable of continuously supplying grains to the market. While few respondents interviewed for this report cited a lack of appropriate storage facilities as a factor limiting their use of ZAMACE, many suggested that there are a number of disincentives in the market that limit their willingness to store grain. These include erratic government policy, and resultant price unpredictability, as well as seasonal production loans to commercial farmers, which encourage farmers to liquidate their crops quickly in order to obtain loans for the next production cycle. Without sufficient incentives to store grain and invest in new storage, grain markets in Zambia will remain highly seasonal, thus limiting the ability of ZAMACE members to spread the fixed costs of the exchange over volumes

throughout the year. In addition, limited grain storage contributes to price volatility, which in a market with weak contract enforcement, increases the risk of payment and delivery default. Because ZAMACE is seen to have limited capacity to enforce contracts, many buyers and sellers find it more secure to trade with those with whom they have a long-term relationship, thus depriving the exchange of potential trade volume. Finally, in highly seasonal agricultural systems, disincentives to store grain, particularly at the wholesale level, reflect a broader unwillingness to take speculative positions in grain markets. Incentives to speculate in grain markets are a necessary precondition for commodity markets to function. When wholesale markets are primarily structured around back-to-back sales the utility of brokerage services is diminished, as many potential sellers, such as commercial farmers, find it more profitable to negotiate directly with processors.

The feasibility of developing efficient commodity exchanges in Africa depends not only on the availability of adequate grain storage facilities. Equally important is that appropriate incentives are in place for market actors to store grain. Governments play a fundamental role in creating policy environments that encourage grain storage and speculation in grain markets. In the absence of appropriate policies, it is extremely difficult for commodity markets to develop into sustainable trading platforms.

3.1.2. Legal and Regulatory Framework

Governments can play a fundamental role in providing the necessary legal and regulatory conditions for commodity markets to thrive. Conversely in the absence of appropriate legal frameworks, commodity markets will struggle to develop. As discussed in section 2.1, weak commercial law and the high cost of contract dispute through Zambia's legal system act as binding constraints to the development of a commodity exchange. Until Zambia's legal system can provide adequate legal support to farmers, traders, and processors the marketing system for cereals will continue to rely on informal institutions to manage risks of contract default that are not well suited to formal trading systems. This will require making political decisions that policy-makers in the region have heretofore been reluctant to make.

In Zambia, as in many countries in the region, agricultural markets are segmented between actors with significant political influence and power and those without. Actors who are politically well connected frequently use their influence to advocate for policies to give them an advantage in the market. Examples include a trader seeking a waiver in import tariffs for a brief time while the firm is in the process of importing grain, or for a miller lobbying for a grain export ban in order to put downward pressure on buying prices. Politically well-connected firms may also be in a better position to get away with walking away from a contract when prices move against them. The possibility that individual actors can influence the direction of policy or protect themselves from punitive actions through their political connections substantially raises both market price uncertainty and the risks associated with anonymous trading on an exchange. As has been discussed in previous sections, these represent two of the major binding constraints to developing a functional commodity exchange. Overcoming the entrenched political power of some actors in the agricultural sector through appropriate and impartial legal reforms must therefore be understood as an integral component of developing vibrant commodity exchanges in the region.

4. CONCLUSIONS

This report has argued that many features of Zambia's agricultural markets have stymied the development of ZAMACE and may undermine the feasibility of ZAMACE to develop into a sustainable and effective trading platform for agricultural commodities. The constraints identified through this case study are not isolated to Zambia, but speak more broadly to the potential for commodity exchanges to develop throughout Sub-Saharan Africa.

Making commodity exchanges work in the context of African food markets is not merely a matter of providing adequate funding and developing appropriate institutions. By their very nature commodity exchanges are situated in the broader context of agricultural markets that are often characterized by pervasive uncertainty, weak legal systems that may not treat all actors equally, small spot markets, limited numbers of potential participants, passive financial institutions, vested political interests, and high levels of policy unpredictability. Thus, when assessing the feasibility of developing a robust commodity exchange governments and donors must discern whether or not existing market conditions are supportive of an exchange. The existence of one or more of these binding constraints can lead to a vicious cycle of exchange under-utilization, opting out by potential participants, and eventual collapse of the exchange, regardless of the degree of financial support offered.

5. RECOMMENDATIONS FOR ENCOURAGING GREATER PARTICIPATION ON ZAMACE

5.1. Arbitration Reform

The first step in driving greater market participation is for ZAMACE to effectively tackle the transaction costs associated with contract shirking and non-compliance. Reliance on an external body to arbitrate disputes on ZAMACE makes the current system both costly and time consuming. This in turn undermines one of the most important functions of any exchange: to provide effective dispute resolution to users. To resolve this, ZAMACE could set up a panel of well-respected individuals to serve as potential arbitrators. Parties involved in a dispute would then agree to use one to three of the exchange's arbitrators, depending on the size of the contested transaction. Internalizing arbitration through a panel of ZAMACE-nominated arbitrators may assist in speeding the process and lowering the cost. Furthermore, the development of regulatory instruments that require parties involved in arbitration to adhere to the decision the arbitrator can lower the frequency with which arbitrations end up in Zambian courts. Only once the potential transaction costs associated with contract dispute are lowered below the costs of traditional risk management strategies will commodity exchanges become viable trading platforms.

5.2. Encouraging the Use of Settlement Guarantee Facilities

A settlement guarantee facility, coupled with effective and timely arbitration, can serve to transform Zambia's agricultural marketing structure. The importance of cultivating interpersonal relationship between buyers and sellers in Zambia is, in part, a response to weak and costly contract enforcement. The ways in which these relationships are cultivated do not lend themselves well to an anonymous and transparent exchange. A settlement guarantee facility, which ensures both quick payment and serves as a disincentive to contract default, can help to make cereal markets significantly more efficient in Zambia. Yet developing a settlement guarantee institution is only the first step. Incentives to use settlement guarantees must be in place for the system to function effectively. Thus, finding ways of incentivizing potential users to buy into a settlement guarantee facility is critical for the development of a sustainable commodity exchange.

Requiring all licensed brokers to open a settlement account may be one way of encouraging use, though it may also lead to significant defection. Another option is to use the purchasing power of the World Food Program (WFP) or other food aid institutions to push adoption, by requiring all their transactions to go through brokers with a settlement account. A final option is to encourage the Zambian National Farmers' Union (ZNFU) to buy a brokerage seat and open a settlement guarantee account. With a brokerage seat and a settlement account ZNFU could potentially attract a large number of commercial farmers to the exchange, who currently do not use the exchange due to concerns over contract default. ZNFU could then require that all their transactions be conducted with brokers who also have a settlement guarantee account. By bringing the trade volumes offered by the commercial farming sector to the exchange in a way that ensures greater levels of protection for buyers and sellers, ZNFU could radically transform the structure of grain trading in Zambia.

5.3. External Regulation and the Legal Standing of the Exchange

Developing statutory instruments that make trades conducted on an exchange legally binding, with a breach of contract carrying with it legal penalties, may be one way of improving the institutional capacity of ZAMACE to protect clients from potential contract defaults. This could be facilitated by assigning ZAMACE regulatory responsibilities to an external and well-respected institution, such as the Security Exchange Commission (SEC). Through this regulatory oversight, constraints associated with a lack of trust in ZAMACE's regulatory capacity and limited accountability may be effectively resolved. Currently board members are tasked with much of the internal regulation of ZAMACE, which some feel undermines confidence in the system. External regulation by the SEC may also promote greater buy-in from the commercial banking sector, which is critical for overcoming some of the liquidity constraints faced by the exchange.

5.4. Outreach Efforts with Commercial Farmers and Medium-scale Wholesalers

Commercial farmers and traders regularly use the ZAMACE reference price when negotiating sales of their commodities, yet very few use ZAMACE as a sales platform. While much of their reluctance to use the exchange results from the potentially high transaction costs associated with contract shirking on the exchange, at least part of their limited use of the exchange may be attributable to their lack of knowledge of the exchange. If ZAMACE can successfully induce greater adoption of a settlement guarantee facility, reform its arbitration processes, and enforce the acceptance of its quality standards, there is significant scope and incentive for commercial farmers and medium-scale wholesalers to begin to use the exchange. Yet the adoption of the exchange will not happen organically. ZAMACE and its members must mount a sustained outreach campaign to the farming and small-scale trading sectors to make them aware of these changes and how these changes can benefit their bottom line, while protecting against fraud and default.

5.5. Political Advocacy

Ultimately, the success of the exchange will depend on the adoption of a coherent, predictable, and rules-based approach to government intervention in cereal markets. This applies to both domestic operations of the marketing board as well as trade policy. Until this happens, there is very little incentive for buyers to take speculative positions in the market. Unpredictable government operations in markets deprive the market of liquidity and volumes, and limit the potential for Zambia to develop more sophisticated market instruments, such as futures contracts. If governments are truly committed to the development of transparent and efficient agricultural commodity markets, then significant changes to agricultural policy must take place. Commodity exchanges may help to facilitate the adoption of more coherent rules-based policies through sustained outreach to policy-makers.

5.6. Regional Market

Limited trade volume and the relatively low number of market participants in Zambia will always hamper the development of a vibrant exchange. Working toward the development of a regional exchange may, ultimately, be the only way of correcting this. ZAMACE is in a strong geographic position to become the commodity exchange for the southern and central

African region. Not only does Zambia border eight countries, but it is also home to the headquarters of the regional trade organization COMESA. Using ZAMACE as a platform for linking smaller trading floors in neighboring countries to a centralized exchange could help to increase market size, liquidity, and competitiveness. However, this would require significant improvements in the openness of cross border trade, trade flows with South Africa, as well as some agreement on how to manage exchange rate fluctuations.

5.7. Warehouse Receipts

Currently Zambia is negotiating legislation that will make warehouse receipts a legal form of security, which farmers and traders can use to obtain loans from commercial banks. The introduction of warehouse receipts may help to encourage greater farm level storage, in both the commercial and small-scale sectors, and thereby lessen seasonal price volatility in Zambia. By tying the liquidation of warehouse receipts to sales through ZAMACE, greater volumes of trade and liquidity can be achieved on the exchange. However, the use of warehouse receipts by sellers, and their acceptability as a form of security by the commercial banking sector, may have less to do with on-going legal processes and more to do with the prevailing political context surrounding cereal crops. The value of a warehouse receipt to both the producer and the financial firm that guarantee the receipt depends on the perceived levels of price risk and uncertainty in commodity markets. For example, if there is a justifiable fear that governments will intervene to push down cereal prices, then there will be limited incentive to store grain and risks premiums tied to warehouse receipts may be prohibitively high. Thus, the effectiveness of the new Agricultural Credit Act in Zambia to stimulate greater use of ZAMACE and greater ability of market actors to store grain depends ultimately on the government's commitment to adhering to predictable, rules-based interventions in grain markets.

REFERENCES

Rashid, S., A. Winter-Nelson, and P. Garcia. 2010. *Purpose and Potential for Commodity Exchanges in African Economies*. IFPRI Discussion Paper No. 01035. Washington, D.C.: International Food Policy Research Institute.