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**Private sector investments to create market-supporting institutions:
The case of Malawian Agricultural Commodity Exchange**

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1. Introduction

Well-known constraints to private investment and innovation in developing and transition economies entail weak public institutions and consequent market imperfections. In agriculture, for example, poor enforcement of legal disputes or public safety standards sharply increases transaction costs on financial, farm input, labor and commodity markets, with negative effects on economic growth, equity and food security (Fafchamps, 2004; Fafchamps and Minten, 2002). To deal with these constraints, literature so far focused on private investment in innovative institutions in mainly bilateral, vertical value chain relationships i.e., supplier-buyer contracts (e.g. Dries et al., 2009, 2011, 2014; Gow et al., 2001). Yet to achieve institutional change and thus innovation at a larger scale, private sector actors have recently started investing in horizontal market-supporting institutions, i.e. changing or building institutions that provide privately enforced rules to value chain actors. Recent examples of such market-supporting institutions include standard-setting institutions (Rouvière and Latouche, 2014), innovation platforms (Pamuk et al. 2014) and public-private support to market information systems and infrastructure development (Poulton and Macartney 2012).

To understand how private sector investments develop market-supporting institutions, we analyze the case of the Malawian Agricultural Commodity Exchange (ACE). We employ a longitudinal study based on interviews to ACE shareholders, transacting parties and key informants - including two representatives of ACE Board of Directors, one donor institution funding ACE Trust (USAID), traders and processors

(Sunseed Oil, Rab Processors, Export Trading Group; Transglobe), international organizations (World Food Program), farmers' associations and trade unions (NASFAM and FUM), non-profit organizations (ACDI/VOCA, CISANET and AICC), research institutes (LUANAR and ICRISAT), industry associations (STAM and RUMARK) and government officers (in Ministry of Agriculture, Ministry of Economic Planning and Ministry of Industry and Trade) - and secondary data (in the form of ACE business plans including shares, investments and revenues from transactions; and recent reports on ACE operations and functioning). Founded in 2006 by the National Small Farmers' Association of Malawi (NASFAM) with USAID support, and having shares bought by Malawian and international agribusiness companies, in 2014/2015 ACE intermediated respectively 11% and 5% of all commercial soybean (7,500 MT out of 68,000 MT) and maize sales (50,000 MT out of 1 MT Million) in Malawi, thus playing a significant role in these markets (ACE 2014).

To analyze the ACE case, a New Institutional Economics (NIE) theoretical lens is chosen to shed light on how ACE – as a market-supporting institution – affects transaction costs of value chain actors (Bardhan 1989; Williamson 1979). Focusing on transaction costs is appropriate especially in commodity markets and in contexts where trust and legal issues play a central role (Williamson 2000). ACE presents a unique case study in the investigation of market-supporting institutions. Commodity exchanges have been established throughout Africa but many have languished (Rashid et al. 2010; Bjerga and Davison 2015). Sitko and Jayne (2012) identified five key reasons why the Zambian Commodity Exchange failed to attract sufficient commodity volumes to establish profitable trade: “(1) the limited success in attracting financial institutions' commitment to commodity exchanges; (2) the anonymous nature of trading on a commodity exchange exacerbates the risks associated with contract non-

compliance and opportunistic behavior; (3) the potential for conflict of interest among brokers; (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” (p. 275). ACE, on the other hand, has observed a sharp rise in commodity volumes since its establishment. The current paper wants to shed light on the drivers of success of ACE. We argue that ACE has overcome a number of market failures by providing a mix of market-supporting institutions that increase trader confidence and the efficiency of transactions.

Our findings suggest that ACE’s governance structure played a crucial role in developing market-supporting institutions beyond the example of other African commodity exchanges: (1) the government finances ACE but does not participate in the ACE Board, so it exercises external rather than internal influence; (2) multiple private investors (including farmers’ input providers, traders and financial institutions) have shares and pool their warehouse facilities in ACE, thus reducing the risks of having only one company dominating ACE trades; (3) the division in ACE Trust and ACE Ltd allows the development of two separate business models (respectively seeking donors’ grants and profits from traded volumes) with specializing competencies; (4) a legal counselor, an independent third-party and the ACE Chief Executive Officer (CEO) mediates among the interests of the farmers’ associations and private investors participating in the Board. We found evidence that these governance factors are critical to generate market-supporting institutions that facilitate commodity trade in Malawi. Beyond expanding on the commodity exchange literature (Sitko and Jayne 2012; Meijerink et al. 2014; Jayne et al. 2014), this study contributes to the literature on the role of private sector actors as initiators of institutional change (Pacheco et al. 2010; Tracey et al. 2011).

2. Market-supporting institutions and institutional change

Markets only function in the presence of an adequate institutional environment. The institutional environment involves formal and informal rules that private trading partners have to comply with and that constrain but also facilitate exchange relationships. Market-supporting institutions ensure that contracts are enforced, property rights are respected, opportunistic behavior by trading partners is diminished, the adverse effects of externalities are reduced, information flows improve, transaction costs are reduced, and tools for risk management are provided (Greif, 2008; McMillan, 2008; World Bank, 2012).

Without such market-supporting institutions, coordination of exchange in the market will incur substantial transaction costs as exchange partners have to safeguard themselves against opportunistic behavior and spend time and effort in finding suitable trading partners, negotiating the terms of exchange, overcoming information asymmetries, monitoring and enforcing agreements. Several studies have shown the importance of personal networks in coordinating exchange relationships in the absence of market-supporting institutions, such as an inadequate legal framework to enforce contractual agreements; or the role of trade credit to overcome the absence of formal financial market institutions (Fafchamps, 2004; McMillan and Woodruff, 2002). As a result, the absence of proper market-supporting institutions leads to limited opportunities for growth: insecure property rights reduce incentives to invest and at the same time reduce opportunities for investment as property cannot be leveraged as collateral; the dependence of exchange relations on close, personal networks limits opportunities to benefit from innovations outside the network and limits the opportunities for growth in sales volume.

Greif (2008) discusses the establishment of market-supporting institutions (MSI) and specifically MSI for contract enforcement. He claims that although contract-enforcing institutions exist in many forms, their effectiveness depends largely on the extent to which they succeed in making the threat of sanctions (or rewards) credible. If no credible threat is established that a breach of the agreement will be punished, then contracting parties will not credibly commit to adhere to their contractual obligations. Greif (2008) distinguishes between ‘organically’ (spontaneously) formed MSI and purposefully ‘designed’ MSI. This holds similarity to Aoki (2007) who distinguishes between the exogenous view on institutions (designed MSI) and the endogenous view (organic MSI). Exogenous economic institutions such as contracts are regarded as “*rational transaction-cost-saving responses*” that are established within the constraints of the institutional environment that is formed by regulatory rules and social norms (North, 1990; Williamson, 2000). Endogenous economic institutions are “*shaped and sustained in the repeated operational plays of the game itself*” (Aoki, 2007).

In organic MSI, the credible threat by the economic agents to impose sanctions deters breach of contract. Such organic market-supporting contract enforcement institutions are most likely to occur in cases where agents value the prospect of continued exchange. The enforcement device in such situations is often based on reputation effects. The potentially negative effect on an agent’s reputation deters contract breach. Such reputation-based deterrence for contract breach is stronger in multilateral reputation mechanisms than in bilateral relationships as behavior can be monitored more easily, more information can be shared, and sanctions are generally higher. Organic MSI for contract enforcement are most likely to emerge in situations where “*parties are locked into their relationships, markets are thin, and it is costly to find a new exchange partner*” (Greif, 2008).

Designed MSI for contract enforcement are intentionally created organizations that are based on more formalized rules. These rules and organizations “*increase the disciplinary impact of economic sanctions by changing the information structure, providing coordination and by altering the strategic interaction among economic agents*” (Greif, 2008). For example, the creation of an organization for interaction among actors, changes infrequent interactions of one actor with any other actor into frequent interactions between actors and the organization. Membership of the organization holds certain value to its members – e.g., because of the possibilities to attract more trade, or by lowering transaction costs as the organization credibly disciplines members to adhere to their obligations. This value of membership, on the other hand, also means that the sanctioning device that the organization can employ is the threat of exclusion in the case that the organizational rules are broken.

The initial set-up costs of the organization in case of the designed MSI for contract enforcement are high: acquisition of organizational capital, making common rules, generating awareness about the existence and credibility of the organization. However, “*once established, designed MSI exhibit low marginal costs of expanding the number of members / individuals / transactions covered by the institution*” (Greif, 2008).

3. Findings

3.1. Background of the case study: ACE history and organizational structure

ACE came into existence in 2006 with donor funding (USAID in 2005-2007) in a partnership with NASFAM (National Small Farmers’ Association of Malawi) to support the development a very “immature” market place (van der Vyver 2014, p. 14). With NASFAM as a founding member, ACE ownership structure was initially created

to protect the interest of smallholder farmers. ACE was initially controlled by ACE Trust, a structure which collected the grant funding. Donor-funded support for ACE included, among the others, \$635,000 from the EU to support the development of warehouse receipts (2011-2013) and \$540,000 from AGRA to support farmer and trader sensitization (2010-2013) (van der Vyver 2014). In total ACE has received approximately \$2 million in donor support since 2005. The core asset, as was the case with many other exchanges, was “the trading system itself” (van der Vyver 2014, p. 3). Initially, ACE facilitated transactions between farmers and buyers of grain (maize) and legumes (soybean, groundnuts, pulses) through an offer-volume-only (OVO) system, which works as a normal auction (buyers compete on price on an established volume offered by suppliers). With such a structure, though, ACE struggled to grow during the first few years, considering that commodities for 10,000 MT were traded overall from 2006 to 2008. A common problem in this phase is the risk of default, that is, that sellers do not provide the commodity or, vice versa, the buyers do not pay after the agreements are made.

In 2010, a “Bid-Volume-Only” (BVO) created specifically to facilitate the procurement needs of the World Food Program (WFP) under its Purchase for Progress initiative, that is, procuring from farmers through ACE to provide grains and legumes in contexts of famine. The BVO system is basically a reverse auction, which allows a buyer to bid to buy a commodity with special terms and volume, but without a specific price. Potential suppliers can offer to sell on the BVO system by placing their offers online or at the physical trading session hosted at ACE offices, thus competing on prices. The buyer is free to select any offers and also free not to select any, if the prices are perceived to be too high ([ACE Africa 2015](#)). The BVO system to sell to WFP and some commercial processors increased ACE trade, which moved up to 40,000 MT by

end of 2010. Still in 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.

Starting in late 2010, private equity investments rapidly transformed ACE from an institution supported by public grants and subsidies into equity-based alliance, where also other financial companies and institutional investors could invest in. While keeping its original structure that protects interests of smallholders (through ACE Trust with board composed by two farmers' associations, NASFAM and Farmers' Union of Malawi, FUM still funded by donors' and government's grants), ACE Ltd. was created as a separate entity to host all the commercial activities of ACE and to take managerial and operational decisions. The ACE Trust had a chairman and four additional trustees, namely a NASFAM representative, a FUM representative, an independent expert, ACE CEO and a legal advisor. ACE Trust must approve activities that affect small operator's participation on ACE. Income is limited to donor aid grants. Grants are mostly linked to specific projects. Parallel to ACE Trust, large input suppliers and traders such as Farmers' World, Rab Processors and BAM bought shares and thus joined the ACE Ltd. in 2010-2012. ACE Ltd has a chairman and four directors from Farmers' World, Rab Processors, the Bankers' Association of Malawi (BAM) plus an independent expert. Along with these voting shareholders, other private investors with shares in ACE (at 2013) include Agricultural Advisors International in Zambia and the non-profit organization Total Land Care (TLC). While ACE shares are open for sale and trade, to avoid the risk of having one dominant investor over the others, no single shareholder can own more than 30% of the total shares (van der Vyver 2014).

Since 2010, ACE is co-owned on a 50/50 basis by ACE Trust and ACE Ltd,

which are two independent entities with the same ACE goals, yet respectively from the perspectives of the small farmers and of the business actors. An Executive Committee coordinates decisions across ACE Ltd. and ACE Trust and provides advice to the CEO, composed by a nominee from the two organizations plus the ACE CEO. Additional restrictions with regard to voting and shareholding both in ACE Trust and ACE Ltd exist to prevent conflicts of interest. From ACE regulations (van der Vyver 2014, p. 33), it is made explicit that “*any activities or decisions by ACE LTD. which affect smallholder farmers’ and other small operators’ participation in ACE shall require approval of the ACE Trust*” (Art. 6.3.5 ACE Regulation) and, vice versa, “*any activities or decisions made by the ACE Trust which affect ACE’s commercial interests must be approved by the ACE Ltd.*” (Art. 6.3.6 ACE Regulation). Finally, “*any dispute where interests are affected must be resolved in an arbitration process conducted by a panel of three (3) neutral arbitrators selected by ACE Ltd. and ACE Trust in consent*” (Art. 6.3.8 ACE Regulation). Since ACE Ltd at its start generated a relatively small income, personnel and all other operational expenses were hosted and paid in ACE Trust, thus supported through grant funding. With its changing structure, and the minor role played by the Government within it (Jayne et al. 2014), ACE benefitted also 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 (Jayne et al. 2014).

This change of the ACE structure went hand in hand with a notable change in the services provided by ACE to its transacting parties. In May 2011, ACE started to provide weekly maize and legume price information services to farmers through the Esoko short-message system (SMS) platform as a way to “advertise” the transactions

to be closed through ACE. Later in 2011, the introduction of the warehouse receipt system (WRS) signed a turning point for ACE. Using the physical commodity as collateral on the basis of a WR was a completely new concept, because commodity finance was hardly available prior to the launch of the ACE WR program financing was only available for selected stakeholders on a balance sheet basis. To give an example of how WRS generate value added to the ACE involved parties, estimates say that the first 21 WR transactions between 2011 and 2012 (4 in 2011 and 17 in 2012) traded 740 MT of maize providing depositors with more than 111,000 USD loans against the tonnage deposited (thus 150 USD/MT). For these 740MT, the overall maize value at sale was 210,000 USD versus 132,000 USD of value at deposit, while total costs (including both the storage and WR issuing costs at 1% rate and the financing interest rates) equaled 43,000 USD. Thus, from the 740MT deposited, depositors overall benefitted from a net margin of 35,000 USD (i.e., 47 USD/MT). In percentage terms, the distribution of the WRS in 2011-2012 in value added was 44% for the depositors, 26% for ACE-certified storage operators, 27% for banks providing the financial services (with First Merchants Bank and the Export Development Bank playing a major role) and 3% for ACE itself (Hernandez 2012). Since 2011, ACE introduced several market-support services with the objective of facilitating the transaction between parties in the maize and legume chain by signaling prices, raise awareness about ACE services, providing storage space, financing with commodity as collateral, providing grading and guarantee together with storage, the possibility to issue future contracts, and internal resolution of disputes (see detail in next section).

3.2. ACE market-supporting institutions

The description of ACE background shows that ACE has been purposely created and hence has led to designed market-supporting institutions that reduce uncertainty in

bilateral transactions. Based on the new composition of its board and its expanded capital structure, ACE changed its governance structure to expand its role beyond the traditional role of commodity exchanges in other African countries (Sitko and Jayne 2012; Meijerink et al. 2014). Specifically, in the period 2011-2014, ACE has introduced a number of market-supporting institutions with the following benefits to ACE traders: insurance system; improved market information system and farmers' training; standards setting; private third-party role in disputes resolution; property rights security system over stocks; facilitated input purchasing and credit access. While not generating financial returns in isolation, these operations had the potential to generate larger commodity trade volumes.

Warehouse Receipt System (WRS): property rights security and risk management. WRS allow farmers to deposit a specified quantity and quality of a commodity in secure and certified warehouses. A receipt is issued to the owner as evidence of location and ownership. A significant characteristic of a WR is the security it provides a buyer. When a WR is offered for sale, the buyer knows that the underlying commodity is in secure storage, being managed professionally. The buyer knows that he will get the quantity and quality stated on the WR and that it is guaranteed by the storage facility operator. The storage operator is liable in case of a default and the WRS requires that the storage facilities are comprehensively insured: the WR owner has to take out on-site insurance, not only for the infrastructure but also for stock on-site, as part of their registration with ACE. This includes third party storage. However, there is no guarantee that should a problem arise and loss or damage occur to products on WR, that the WR owner will be refunded. The insurance company will pay the insured warehouse owners but the WR owner will depend on the integrity

of the WO to make on his losses. If not, the only recourse would be through legal action.

Moreover, *“the receipt is a negotiable instrument that can be sold or used as collateral for a loan, backed by the claim to the commodity held in the warehouse”* (World Bank, 2012). This is also beneficial to the banks as they are able to reach a new set of customers for financial services and products. Apart from security of ownership and quality, and improved access to credit, the WRS also reduces risk for farmers by protecting them against low market prices as products can be stored safely until prices improve. The system was designed for small-scale farmers (individuals or cooperatives) but it is also open to traders. An additional tool for risk management was introduced in 2013 with the creation of forward contracts: a new financial instrument for farmers and traders to sell at today’s price in an established date in the future.¹

Currently, ACE facilitates operations of three rural warehouses in Malawi namely Kafulu, Nathenje and Balaka. But ACE also uses urban storage operated by large operators such as Rab and Farmers World.” ([ACE Africa 2015](#)). ACE registered the GSL silos in Kanengo (Lilongwe) as the first WRS storage facility. The GSL facility has a capacity of 12000 MT and it was open to deposits from any interested third party. OIBM was the first bank to confirm that they were willing to finance a WR. OIBM proposed to finance 60% of the value at 20% pa or 70% at 22% pa. These rates are very attractive to the small scale sector and ACE promoted this opportunity,

¹ Use of the WRS comes at a cost. A commission of 1% out of the value of the transaction with the WR “backs up” the trading (instead of 0,2% commission for the BVO and Bid-And-Offer trading). There is a difference of 0.8% between a WR guaranteed trade and „bulletin board“ type trade whereby the offer is only advertised on ACE’s trading screen with no guarantees. This inherently refers to a „clearing house“ type function performed by ACE. A developed exchange would differentiate between the clearing fees and broker commissions as well as taxes such as VAT, if applicable.

as a way for them to receive financing, retain ownership of the maize and thereby enable them to sell the maize at a time when the market is more attractive than it is immediately after harvest ([ACE Africa 2015](#)).

Commodity exchange: reduced information asymmetries; increased power of disciplinary sanctions because previously infrequent interactions between trading partners are replaced by frequent trade interactions with ACE. The ACE Registry is an electronic database containing all information about all WRs issued. The two main functions are to manage ownership, including transfers of ownership, and to calculate all outstanding finance and storage costs. The Registry is integrated into the ACE trading system and all information is public and available through the ACE website. The public can see how many WRs have been issued; in what locations; and, if they are offered for sale, at what price. By selecting a specific receipt all information about this receipt will be available, except ownership if the owner wishes to remain anonymous. The information would include all commodity details; specified storage and financing outstanding on that WR to that date; and a full audit trail history of the WR from the time it was first issued. A WR is a transferable document. This means that ownership can be transferred but it has to be recorded and approved by the Registry to have legitimacy. The only restriction in relation to transfer of ownership is that all outstanding costs are settled before ownership is transferred. A WR cannot be traded for less than the value of outstanding costs. A WR is a very flexible document; the owner can decide to split, merge, refinance, transfer and cancel the WR.

Standards setting and enforcement: reduce information asymmetries and transaction costs in search for desired products. ACE 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.

Information exchange: reduced risks and information failures. Without accurate market information, farmers are reluctant to expand production and trading activities. ACE has implemented an “advertising campaign” for the exchange. This campaign has been an instrument for sharing market information. The more people are aware of prices, particularly smallholder farmers, the better the chance that they market their products through the ACE commodity exchange. In the long run, to offer this information service, ACE is planning to introduce a fee (US\$0.60/month to farmers) (van der Vyver 2014). Partnership with USAID Market Linkages Initiative allows collecting and distributing price information in 13 locations across Malawi through enumerators. 25,000 farmers registered in late 2014.

Dispute settlement mechanism: reduces transaction costs in ex post conflict resolution. ACE has clearing and settlement processes in place that is supported by the online database on trade and traders, and the warehouse receipt system.

3.3. Impact of ACE market-supporting institutions on the governance of trading relationships and traded volumes

While by 2012 ACE traded overall 100,000 MT of commodities, the immediate returns of developing a portfolio of market-support institutions was to reduce market uncertainty - thus decreasing information, negotiation, monitoring, coordination and contract enforcement costs by market players (some of those are also ACE’s shareholders) – and thus sharply increase commodity volumes. Thus, while donors’ grant funding still supports ACE Trust on specific projects with approximately 500,000 USD/year up to 2016, ACE Ltd. has now become self-sustainable with revenue generated through trading that compensates losses made through the operations

mentioned above. In 2013 to 2015, ACE is in the process of transferring all commercial operational expenses to ACE Ltd, as there is an increase in the income generated (see business plan in van der Vyver 2014).

As a result of these changes, trade facilitated through ACE increased sharply from 20,000 MT only in 2012 to almost 60,000 MT in 2013 and 67,000 MT in 2014 (ACE 2014; Moller 2014). Specifically, traded soybeans increased from 1,600 MT in 2013 to 7,500 MT in 2014, while traded maize went from 30,000 MT in 2013 to 50,000 MT in 2014 (ACE 2014) with 462 transactions made from January 2013 to March 2014. While this is a small fraction of the total volume of agricultural trade in Malawi (respectively 5% of total maize traded and 11% of total soybeans traded in Malawi), it does represent a moderate shift toward greater levels of formalization in the agricultural markets in the country (Jayne et al. 2014). Importantly, the portfolio of buyers has significantly broadened from 70% commodity traded to WFP in 2011 to 30% traded to WFP in 2013. Trading of maize, pigeon peas, soybeans and groundnuts in 2014/2015 is estimated to increase up to from 7,000 MT to 20,000 MT through the BAO system, from 29,500 MT to 51,000 MT through the BVO system and from 27,000 MT to 30,000 MT through structured deals including forward contracting. Considering only the revenue from trading, this should increase ACE revenue from BVO and BAO (with or without WRS back up) from 154,000 USD in 2013/2014 to 305,000 USD in 2014/2015. Considering ACE organizational structure and costs, these increased revenues would make the ACE Ltd. Move from a loss of 173,937 USD to a 9,500 USD.

Looking at the near future, ACE's strategy is to further expand through the following activities: 1) introducing more storage facilities in Malawian areas; 2) expanding to regional trade; 3) by expanding WRS and forward contracts, expanding

opportunities for “indirect trade”, i.e. to generate multiple transactions among parties without necessarily moving the grain, but only its ownership. Storage certification provides a mechanism to monitor the storage quality against an established ACE standard without transferring ownership from the storage owner and ACE, thus the storage operator can profit from the warehouse ownership; receives a credible signal from ACE acting as third-party; and receives (at a cost) insurance services by banks to cover the risk of storing the grain for the depositors. By 2012, storage operators included Grain Security Ltd. (the largest with 12,000 MT space), Rab Processors, Senwes Warehouse and NASFAM in Lilongwe; and Transglobe Ltd., KU Distributors, Rab Processors (the largest with 40,000 MT space) in Blantyre; plus two smaller warehouses in Dowa and Balaka (Hernandez 2012). More recently (2013-2014) though, warehouse facilities in rural areas were also certified to Export Trading Group, Land o’Lakes and Pro-Pack. ACE-certified storage thus moved from 12,000 MT in 2011 to 155,000 MT in 2014, with 2.8% of ACE-certified warehouse space being in rural areas (Moller 2014). The expansion in rural areas may also favor the an stronger use of ACE WRS directly by small depositors (i.e., individual farmers or farmer groups): so far (2014), approximately 25% of depositors are farmers themselves, while 75% are trading companies (Moller 2014). Despite the potential for regional trade, with ACE now including trading partners from 6 countries outside Malawi, the actual pace of growth remains uncertain due to uncertainty in the arbitrary establishment of export bans by the Malawian Government (van der Vyver 2014).

4. Discussion and Conclusions

The case of ACE in Malawi first confirms a basic assumption of the NIE literature: appropriate “designed” market-supporting institutions (Greif 2008) reduce uncertainty

in transaction relationships (e.g., reduced likelihood of being cheated by trading partners), which, in turn, leads to more market-type forms of exchange: trade increases among anonymous transacting parties, traders' network and transactions grow, commodity depositors (farmers or traders) gain access to store and sell commodities and increase their volumes of trade at competitive prices, and related markets for financial products (loans, insurance and futures), certified warehouses and information & knowledge systems emerge. At the same time, introduction of formal market mechanisms start to substitute the pre-existing trade relationships based on tight networks, family ties and local forms of trade (Aoki 2007).

Departing from the NIE literature (Aoki 2007; Grief 2008), though, the case of ACE demonstrate that multiple private actors (traders and processors, farmers' associations, financial institutions) can design MSI and thus "formal rules of the game" (North, 1990; Williamson, 2000) in coordination with public actors, donors and non-profit organizations. This multi-lateral private response to an "institutional failure" (such as an inadequate legal framework to enforce contractual agreements or the poor road, warehouse and communication infrastructure systems) departs from the theory of Fafchamps (2004) and McMillan and Woodruff (2002) assuming that tight informal networks are the most likely responses. Instead, the multi-lateral private response to an institutional failure in the case of ACE resemble to a phenomenon of "institutional entrepreneurship" (Pacheco et al. 2010) in the sense that actors pooled resources in coordination with others to realize an institutional change (the creation and establishment of the ACE governance) which, in turn, designs MSIs that create value to their participant. In undertaking the choice of investing their private resources in a form of institutional change, the private actors face trade-offs between high initial institutional set-up costs (including the investment of private resources and ex ante

transaction costs to set “the rules of the game” in ACE) and high ex post transaction costs if their do not set up rules that effectively design MSIs that create value for the transacting parties. The initial set-up costs of the organization in case of the designed MSI are high because, along with for establishing the MSIs among ACE parties, the private actors also invested their private capital (pooling financial and physical capital, governance and inter-firm coordination skills, taking institutional and political risks) in establishing the rules that govern ACE itself.

By establishing new “rules of the game” in ACE, multi-lateral private investors in ACE create the conditions to design MSIs that respond – at least to some extent – to the six major factors impeding trading on agricultural commodity exchanges in Sub-Saharan Africa (Sitko and Jayne 2012; Jayne et al. 2014). According to Jayne et al. (2014), the six factors limiting the development of commodity exchanges include:

(1) Limited success in attracting financial institutions’ commitment to commodity exchanges (see also Coulter and Onumah 2002). In the case of ACE, financial institutions started providing loans and insurance to the depositors and storage owners when they started participating to ACE Ltd., the commercial arm of ACE, to share knowledge and establish common MSIs. Specifically, ACE acted as a third party to moderate the risk of default by assessing who were the depositors receiving the credit and creating a database of debtors/depositors, thus creating an interlinked transaction (i.e. providing access to storage, market and credit at same time). Moreover, in establishing the MSIs the commercial partners in ACE Ltd. could negotiate two financial instruments at the same time (i.e. loans and insurance), because the storage owners need to receive insurance too to protect themselves from the storage risks (theft, fire, confiscation or others);

(2) Failure of commodity exchanges to offer contracts that respond to unmet trader needs, especially those seeking mechanisms for hedging quality, price and delivery risk (Jayne et al. 2014). Through the design of MSIs, traders participating in ACE (as shareholders or as transacting parties) receive several market benefits, including: - ACE third-party certification as storage operator (thus making revenues from storage transactions with depositors); competitive market information (free as still subsidized by donors) and market facilitation (0,2% or maximum 1% commission in case of WRS) as transacting parties (either buyer, seller or storage user); competitive prices as storage users; competitive financial services (loans and insurance services); and donor funding to provide knowledge to farmers on ACE services, thus with potential to further expand the trade potential within Malawi. This attracted the major trading and processing companies to participate as shareholder or transacting party in ACE.

(3) The inability of commodity exchanges to reduce the transaction costs of the exchange (Jayne et al. 2014). The establishment of MSIs such as resolution of disputes, insurance mechanisms against default and the presence of few large traders in the market – thus creating a situation of monopsony in the market – reduces the risks of default and associated risks.

(4) Potential for conflict of interest among brokers who also act as off-market traders (Jayne et al. 2014). Indeed, ACE may face risks of conflicts of interest given the high presence of private investors acting both as trade brokers and one of the parties (i.e. storage owners or depositors), as well as financial institutions. Yet, two mechanisms are designed to prevent conflicts of interest: first, none of the private investors can detain more than 30% shares of ACE Ltd; second, ACE Trust and ACE Ltd. are two mutually controlling but independent governance bodies that guarantee

that farmers' associations interests are safeguarded. While ACE has most of its transactions between large traders (i.e. both the depositors and the buyers are traders rather than farmers), ACE is also slowly expanding in rural areas and providing information and training services to stimulate farmers' participation. Yet, an open theme remains whether ACE should benefit farmers directly (by attempting to increase the number of farmers directly transacting through ACE as depositors) or indirectly as a "trickle-down effect" from traders participating to ACE.

(5) Potential for market manipulation, which occurs when markets become thinly traded. For example, in other Sub-Saharan countries marketing boards purchase a large segment of the traded commodities, creating asymmetries between buyers and sellers (Jayne et al. 2014). This risk is limited in Malawi because of the presence of a competing, Government-supported commodity exchange (AHL) that trades the same commodities as ACE. As such, in 2014 ACE was trading no more than 5% of the entire maize market and 11% of the entire soybean market. As the trade volumes in ACE increase, though, this is a risk that will need to be taken under consideration – as it may create tensions with public and private actors outside ACE, first and foremost the Government supporting the competing exchange and in the position of strongly influencing ACE through trade and agricultural policies.

(6) Limited economies of scale, with high fixed costs and low trading volumes, may prevent the financial self-sustainability of commodity exchanges (Jayne et al. 2014). Indeed, Malawi has a relative small internal market, yet traders and financial institutions benefit from taking multiple roles in ACE (as discussed in point 2 above). Importantly, despite ACE is a commercial entity, its profit for the moment is limited to cover its staff and management costs (and still not fully covering the costs, thus ACE Trust is covering them). In fact, from WRS transactions ACE only gains 1% of the

total traded value. Despite this limited profit for ACE, the transacting parties in ACE (including ACE private investors in ACE, other traders and farmers) benefit from ACE trade thus making their investment in ACE worthwhile. The challenge will be to make ACE structure fully covered by ACE commercial, which would mean becoming independent from donor grants for ACE structure and for some of its specific services (information & knowledge systems). This will require a monetary shift from donor grant funding to higher volumes and thus costs by the transacting parties or the recipients of the information services (thus in part traders investing in ACE and in part farmers participating to ACE Trust).

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