The Interaction of Formal and Informal Institutions in Development: The Ethiopian Commodity Exchange and Social Capital in Sesame Markets

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Abstract: We explore whether the creation of the Ethiopian Commodity Exchange (ECX) and its formal monitoring and enforcement institutions has affected social capital and trust in the Ethiopian segment of the sesame value chain. Consistent with a simple theoretical marketing model, our panel data suggest this is indeed the case. Trade in sesame is increasingly governed by formal rather than informal institutions, and in response traders have broadened their trading network, rely more frequently on traders with whom they do not have social relations, and have reduced the extending of credit that cements personalized relationships. They also have lower levels of trust in the intentions and capabilities of their trading partners, and attach less weight to trust.

1. Introduction.

The quality of institutions, broadly defined, is widely regarded as a key determinant of economic performance. There is little consensus about which specific dimensions of the institutional framework matter most for development, and even less about the mechanisms driving institutional change over time.[1] The institutional framework is broad, encompassing formal and informal institutions. Formal and informal institutions are different because the former are centrally designed and enforced, and the latter are subject to private self-governance (Dixit, 2004; Williamson, 2009). However, formal and informal institutions also interact, and it is increasingly recognized that the nature of this interaction matters. For example, formal institutions are 'embedded' in informal ones, and the results of institutional reform may depend on how formal institutions map onto informal institutions (e.g. Boettke et al., 2008; Williamson, 2009). But formal and informal institutions may also provide substitute mechanisms to govern (economic) transactions, and an exogenous expansion of the realm of formal institutions may crowd out informal ones—potentially with unforeseen consequences (for example, see Caselli, 1997; Dixit, 2004).

One particular 'type' of formal institution that has gained prominence in policy circles aiming to boost agricultural development across Africa is the so-called commodity exchange. While African agricultural markets are increasingly liberalized, translating into greater private investments and increased levels of regional trade and market integration (Mason et al. 2011, Smale et al. 2011), price volatility of food staples remains high and traditional forms of exchange still involve relatively high transaction costs (Sitko and Jayne 2012). Such marketing challenges may be tackled via commodity exchanges—

[1] But see Kingston and Caballero (2008), who identify two broad categories of processes of institutional change: change by *design* (emphasizing a purposeful centralized authority) and change by *evolution* (where uncoordinated choices of many agents more or less 'spontaneously' produce a system of norms rules).

platforms that bring together buyers and suppliers. According to Gabre-Madhin and Goggin (2005), commodity exchanges stimulate market transparency and price discovery, and attenuate collusion, (speculative) bubbles and price volatility. They may also lower transaction costs by increasing the range of trading partners, by providing monitoring and enforcement of standards and contracts, and by tackling conflicts via arbitration services (Sitko and Jayne 2012). In light of these expected benefits, it is no surprise that donors and national governments are promoting and facilitating the emergence of commodity exchanges across the African continent (albeit with mixed results—see Sitko and Jayne 2012).

In this paper we examine the effects of the emergence of a commodity exchange on informal marketing institutions. Specifically, we explore how the Ethiopian commodity exchange (ECX) affected the structure of the sesame supply chain within Ethiopia, and probe the consequences for transaction patterns and trust within this chain. Broadly speaking, we analyse how the emergence of a formal trading structure affects various measures of structural and cognitive social capital within the sesame trade sector (key components of informal institutions governing the domestic trade in sesame). To guide the analysis, we present a theoretical model proposed by Ahlerup et al. (2009), which suggests social capital and formal institutions are substitutes in development. Earlier studies of social capital in Africa confirm the important economic role of social capital in early stages of development, supporting the view that social capital matters most when formal institutions are weak (e.g., Narayan Pritchett 1999, Bigsten et al. 2002, Fafchamps Minten 2002). In our empirical analysis we ask whether the expansion of a formal institution—creation of the ECX—has crowded out informal institutions.

The paper is organized as follows. In section 2 we provide background information about the ECX, and explain its workings. In section 3 we sketch a simple model

highlighting the interaction between formal and informal marketing institutions, and derive several testable hypotheses. Most importantly, since formal and informal institutions provide substitute mechanisms to govern the flow of sesame from producer to exporter, the model predicts that the ECX will crowd out social capital in the trading sector. In section 4 we introduce our data and discuss our identification strategy, based on a simple panel model comparing pre- and post-ECX characteristics. The conclusions are provided in section 5. We document evidence supporting the hypothesis that formal institutions may crowd out informal ones.

2. Sesame and the Ethiopian Commodity Exchange (ECX)

2.1 Sesame Trade and the ECX

Sesame is the second-largest export crop in Ethiopia, after coffee, and accounts for over 90% of the value of oil seeds exports. Sesame exports from Ethiopia constitute around a fifth of world sesame exports, and in 2010, Ethiopia was the second-largest sesame exporter in the world, after India (FAOSTAT, 2012). Sesame is grown mainly for export markets and little value is added in Ethiopia (Wijnands et al., 2009). It is mainly grown by small-scale farmers in four regions in Ethiopia (Tigray, Amhara, Oromia and Beneshangul Gumuz). In the past decade, the area under production has grown 8-fold to 316 thousand ha, or 2% of Ethiopia's arable land (FAOSTAT, 2012).

The ECX was established in 2007 by the Ethiopian government, and started operations in 2008. The aim is to channel all exports of major cash crops via the ECX, so that transaction costs decline, market transparency increases, and better price information becomes available for producers and traders. It was expected that the ECX would benefit small traders: '.. the ECX [brokerage services] could particularly benefit many kinds of traders – those who lack social capital, those who suffer from liquidity constraints while their working capital is tied up in unsold stocks, those who cannot afford to pay for storage

facilities under their exclusively control, those who are based in drought-prone areas and those who conduct long-distance purchases and rely upon non-asphalt roads' (Quattri et al. 2012, p. 21). An additional benefit for the government, albeit less advertised, is that centralized trading enhances the scope for efficient taxation.

The ECX opened up for sesame trade in 2009, and became the mandatory channel for sesame exports in late 2010 (The Council of Ministers Regulation No. 178/2010).[2] The ECX specifies seven different contracts for sesame, basing grading on foreign matter (max % by weight) and contrasting colour (max % by weight).[3] Not surprisingly, in light of the compulsory status, volumes of sesame and other crops traded via the ECX have grown rapidly. In its fourth year of operation (2011/12), the total traded volume reached 601.000 tonnes, consisting of coffee (39%), sesame (50%), and pea beans (11%) (ECX, 2012; Rashid and Negassa, 2011). Trading maize via the ECX is not mandatory, and cereal traders prefer to rely on informal markets—volumes of maize traded on the ECX have decreased to almost zero.[4]

The ECX is basically an open-outcry trading floor, resembling a standard spot market exchange. Traders who sell are known as 'suppliers', retailers or '*acrabis*,' and are mainly rural traders who buy commodities from farmers. In addition, producers' organisations and larger individual farmers sell on the ECX. Buyers on the ECX are usually exporters or processing companies.[5] To be eligible to trade on the ECX, one has to become a member. Some members trade on their own account ('trading members') and others perform a brokerage role and trade for others ('intermediary members'). Membership may be 'full' or 'limited,' with limited membership restricting trade in certain

[2] Article 18.2 of the Regulation reserves the right for *producers* to export sesame seed directly, without going through the ECX. However, these producers must register and grade their commodities with the ECX. Some exporters have bought farms to export directly.
[3] 1. Gonder Sesame Seed Grade 1 (GSS1) Grade 2 (GSS2); 2. Humera Sesame Seed Grade 1 (HSS1) Grade 2 (HSS2); 3. Wellega Sesame Seed Grade 1(WSS1), Grade 2 (WSS2) Grade 3 (WSS3).
[4] The last transaction of 2012 was July 5th, when only 5 tonnes were traded. Source: ECX website, checked on 27 January 2013.
[5] Very little sesame is consumed domestically

commodities on either the buying or selling side. By the end of 2012, the ECX had 245 full members and 283 limited members. Memberships are auctioned, and the price of membership increased from 50,000 birr (5,100 US$) in 2008 to 1.35 million birr (80.000 US$) in 2011 (ECX, 2012).[6]

In addition to functioning as a trading floor, the ECX provides several services. It disseminates prices to 250 Rural Electronic Price Tickers at public market spaces, via radio and mobile phones. In addition, the ECX classifies, grades and stores commodities in 55 warehouses, providing warehouse receipts in return. It maintains an automated central depository of exchange warehouses receipts (see below), and has become a system for clearing and settling all trades. The ECX also supports a system for market surveillance, risk management and dispute resolution (through arbitration).

2.2 Sesame Markets Before and After the ECX

Before the ECX was created, farmers would typically sell to (visiting) traders. These traders 'bulked' sesame into larger quantities for selling at larger regional wholesale markets, in Addis Ababa, or directly to exporters. Large farmers could also sell to cooperatives or exporters. In 2010, after the government of Ethiopia decreed that 'any person involved in sesame transactions shall effect sesame transaction only at primary transaction centres (PTCs) and the Ethiopian Commodity Exchange' (Government of Ethiopia, 2010), buying or selling sesame directly from farmers became illegal. Farmers must now sell at a PTC and traders must buy at a PTC. A PTC is a fenced location with certified scales, a market information board, and local inspectors certifying goods traded at the PTC.

[6] The exchange rate for 2008 was 9.8 birr to 1 US$; the exchange rate in 2011 was 17 birr to 1 US$.

Traders buying from PTCs (*acrabis*) must obtain a (Woreda-specific)[7] certificate of competence, and demonstrate that they own a warehouse within the Woreda, a weighing scale and a certain level of capital. When purchasing sesame from a PTC, the trader receives a certificate that allows him to sell and deliver the sesame to an ECX warehouse. Officially, cooperatives are required to follow the same procedure. Currently it is not known to what extent PTC regulation is enforced, or whether some traders still bulk sesame by buying from small farmers and selling this at a PTC 'in name of a farmer.' Our 2012 survey suggests that some traders still buy directly from farmers.

2.3 The Warehouse Receipt System

In 2012, the ECX was linked to 55 warehouses for coffee, sesame and pea beans. Warehouses are based in 17 regional locations that are main production areas. For sesame there are seven delivery locations.[8] After classifying and grading, traders can deposit their commodities in these warehouses in return for a warehouse receipt. In the early days of the ECX, these receipts were used as a delivery instrument. In March 2011, the Warehouse Receipt Financing scheme was launched[9], allowing farmers, producers, and traders to access bank loans by pledging their warehouse receipts issued against commodities deposited in warehouses. The ECX uses electronic Warehouse Receipts (e-WRs) issued by the ECX Central Depository, facilitating both the transfer of title on the ECX and pledging the commodity as collateral for loans.[10]

Warehouse receipting is limited by the short expiry dates on e-WRs, which is two months from issue for sesame. This expiry date enables loans for up to 50 days,

[7] A Woreda is a district or third-level administrative division in Ethiopia.
[8] Humera, Metema, Gonder, Assossa, Bure, Nekemte and Addis Ababa (ECX website October 2012)
[9] This was supported by the IFC The IFC offers a short-term loan to a bank, which will in turn use the funds to lend to farmers, agriculture commodity producers, or traders against warehouse receipts or equivalent as collateral. The IFC also guarantees up to 50% of short-term loans extended to agriculture commodity producers or traders against warehouse receipts or equivalent as collateral.
[10] Although the ECX reported in 2011 that farmers use the WRS, only sesame traders use this system (Coulter, 2012; ECX, 2011). Especially small farmers still face several hurdles, including the lack of involvement of local banks (IFC and ECX, 2012).

discouraging stockpiling and speculation. The reason for the short expiry date is limited storage space at the warehouses, and the on-going need for export revenues by the Government. Sesame exporters also believe that a quick turn-over is advantageous because demand is high in the winter months, when production takes place (Coulter, 2012).[11]

In the ECX contracts for sesame, quality is measured by foreign matter (impurities) colour contrast. In pre-ECX days, prices were mainly based on quantity and farmers and traders blended different seed types. This decreased the overall quality and value of the seeds. The ECX was supposed to improve sesame quality by grading at warehouses, but various observers have noted that the actual quality of sesame may bear little resemblance to grades accorded by the ECX (Coulter, 2012; van den Broek, 2012). There are rumours that traders can bribe grading officials to upgrade their produce, so that low grade sesame is delivered to traders who paid for a higher grade.

2.4 Typology of Traders

The very short supply season (November to January) invites the involvement of various agents in sesame marketing. Broadly speaking, two categories of sesame traders exist in Ethiopia: (i) those who buy and sell on their own account (wholesalers, assemblers, suppliers, exporters) and (ii) those who perform an intermediary function, and are contracted by the first category of traders (selling or buying agents and brokers). Buying and selling agents differ from brokers because their remuneration depends on price margins; they may run a price risk. With the establishment of the ECX, brokers were obliged to be officially registered with the ECX, which greatly reduced the number of brokers.

[11] As of 2012, ECX warehouses face several capacity problems. Limited storage weighting capacity cause long delays long queues of trucks waiting in front of warehouses. Because the sesame season is short (November-January), the strain on the delivery infrastructure hling process for sesame is particularly large.

For this study, we interviewed buying and selling traders and have not included intermediaries. More specifically, we distinguish between exporters and other traders (supplierss, wholesalers, assemblers). The reason is that exporters trade fully *within* the ECX system—buying sesame deposited at an ECX warehouse at the ECX, and selling to foreign importers (see figure 1). Other traders may also sell sesame to other traders (or to ECX Warehouses), and are less affected by the formal institutions of the ECX than exporters. Informal institutions may still govern the trade between such transacting traders.

<< Insert Figure 1 about here >>

3. A Theoretical Model

In this section, we sketch the bare bones of a simple model that demonstrates the interaction between social capital (and trust) and formal institutions in the process of value generation within the (sesame) value chain. This model is based on Ahlerup et al (2009), but rather than analysing how an exogenous shock in the level of social capital affects economic performance (and specifically how this impact is mediated by the quality of formal institutions – as in Ahlerup et al. 2009), we seek to examine the impact of a shock in terms of the quality of formal institutions – such as the sudden provision of arbitrage, monitoring and enforcement services via the ECX.

Consider a sequential, principal agent supply game, with a representative supplier (S) and demander (D), and an outside agency that may be accessed for arbitrage services (A). The model is simple in that we ignore outside options beyond the trade opportunity analysed in the game, and reputation effects or other dynamic effects do not play a role. The stages of the game are as follows:

1. The demand stage, where the demander decides whether or not to purchase a certain quantity, valued at *k*, of the commodity (sesame) that is traded. If the

demander chooses not to purchase the sesame the game ends, and payoffs for both parties equal zero: $u_D = u_S = 0$. In case the demander decides to purchase the sesame valued at *k*, the game enters the delivery stage.

2. In the delivery stage, the supplier decides whether to offer the specified quantity and quality of sesame, or to renege and offer an inferior package. In the former case, payoffs are defined as follows: $u_D = \pi_D + s_D$ and $u_S = \pi_S + s_S$. In these expressions, π_i denotes the standard gains from trade for agent *i* and s_i denotes a non-monetary social benefit associated with being an honest trader (where *i* = S,D). This is a social reward, or moral satisfaction stemming from generalized trust and trustworthiness, and is associated with the level of social capital (see below). We think of s_i not as an innate characteristic of traders, but as a payoff that is specific for pairs of traders, conditional on prior experiences (i.e. as a function of past 'investments').[12] Obviously, s_i, $\pi_i > 0$. This socially optimal outcome does not eventuate, however, when the supplier reneges. In that case the game enters the arbitrage stage.
3. In the arbitrage stage, the demander decides whether to take the supplier to an arbitrage agency to enforce the initial contract, or not. If the demander accepts the inferior package without accessing arbitrage, the payoffs are defined as follows: $u_D = -k + s_D$ and $u_S = \pi_D + \pi_S$. In words, if the demander accepts the package he foregoes the full value of the sesame. Hence we assume here the value of the inferior package that was offered equals zero; the analysis is easily augmented to capture the case where the value of the inferior package equals αk, so that the loss for the demander is only (1-α)k. The demander retains the social reward from being an honest trader. The supplier in this case captures the full benefit from the trade,

[12] In other words; taking advantage of a trusted friend 'feels' different from taking advantage of an anonymous stranger.

but of course does not enjoy the non-monetary social reward ($s_S = 0$). In contrast, when the demander decides to seek arbitrage, the game enters the ruling stage.

4. In the ruling stage, the arbitrage agency rules in favour of the demander, or not. The exogenous probability of enforcing the contract, or a measure of the quality of formal institutions in what follows, is given by β. In case the agency supports the demander, and enforces the initial contract, the payoffs are defined as $u_D = \pi_D + s_D$ and $u_S = \pi_S - d$. In words, the demander is fully compensated, and in addition enjoys the social reward. The supplier enjoys the regular benefit from trade, but has to pay a fine *d*, which is the cost of running the arbitrage case. With probability (1-β) the arbitrage agency does not rule in favour of the demander, in which case the demander pays the fee so that payoffs are defined as: $u_D = -k - d + s_S$ and $u_S = \pi_D + \pi_S$.

With these payoffs, the optimal strategies for the agents are readily derived. The sub-game perfect Nash equilibrium of the game, and associated best response strategies, are described as follows.

- In the demand stage, the demander should demand if any of the following three conditions is satisfied: (1) $L = s_D + \beta(\pi_D + k + d) - k - d \geq 0$, (2) $s_D - k \geq 0$, or (3) producer will be honest. If none of these conditions is satisfied, the demander should not purchase any sesame. Note that high levels of social capital, represented by large realizations of s_D, are conducive to trade. The same is true for the quality of formal institutions, β, or the probability that deviations from honest behaviour will be punished by the arbitrage agency down the line – s_D and β are substitute mechanisms to increase the probability of engaging in trade.
- In the delivery stage, the producer should be honest if $F = s_S + \beta(\pi_D + d) - \pi_D \geq 0$. Otherwise he should renege and offer the inferior package. Social capital, here

entering via the term s_S, again is conducive to honest trade, and so is the formal institutions parameter β. Social capital and formal institutions are substitute mechanisms to discipline potentially cheating suppliers.

- In the arbitrage stage, the demander should not seek arbitrage services if both $s_D - k \geq 0$ and $\beta(\pi_D + k + d) - d \leq 0$. Else he should seek arbitrage.

We can use this model to probe the consequences of an exogenous shock in the quality of institutions (β), such as due to the new arbitrage and enforcement services made available by the ECX. Examining the optimal responses in the demand and delivery stage, it is immediately obvious that raising β increases the risk of honest trading behaviour: $\partial L/\partial\beta > 0$ and $\partial F/\partial\beta > 0$. The probability that improving enforcement arbitrage 'tilts' the balance such that the equilibrium outcome of the game switches from no trade (or reneging) to honest trade is decreasing in the level of social capital. Formal institutions and social capital provide substitute mechanisms to foster honest behaviour, and for sufficiently large values of social capital, relative to monetary payoff parameters *k*, *d* and π_D, improving the quality of formal institutions does not matter (i.e. both L>0 and F>0 even for really low values of β).

If formal institutions are poor or absent, trade will not occur unless social capital levels are high enough. In the formal institutional vacuum of the pre-ECX era, serious trade beyond the 'flea-market' types of exchange could only occur in the presence of trust and trustworthiness. Maintaining such levels of trust requires constant investment, as was documented for the case of Ethiopian sesame trading by Cecchi and Bulte (2012), and poses natural limits on the expansion of trade levels (see Tabellini 2008 for a formal treatment of 'distance' as a factor explaining trustworthy behaviour). The availability of formal arbitrage conditions alters the rules of the game, enabling the transition from personalized to anonymous exchange between 'strangers.' Insofar as on-going investments

in social capital become less important when a substitute mechanism becomes available (so that s_i falls), or insofar as formal institutions enable transacting between traders that heretofore would never engage in trade because of low levels of trust (so that trading pairs with low levels of s_i enter the market), a new equilibrium emerges characterised by, on average, lower levels of social capital between interacting parties. Hence, $ds/d\beta < 0$, or, formal institutions will gradually crowd out informal ones.

In what follows, we try to test this hypothesis using various proxies of social capital among sesame traders in Ethiopia, collected before and after the introduction of the ECX.

4. Data and Identification

4.1 Introduction

We seek to analyse the interaction between formal and informal institutions, and more specifically try to explore how the emergence of the ECX affected informal trading arrangements among sesame traders. Our data were collected during interviews with various types of sesame traders in 2010 and 2012 – just before and after the introduction of the ECX. An overview of the types of traders in the two surveys in provided in Table 1. We also report information on the subsample of traders for which we have been able to collect data before and after the ECX (the panel subsample).

For the first survey, in January and February 2012, we randomly sampled traders, visiting them at random times at different locations during an extended period: 41 markets in 5 sesame producing regions (Gonder, Humera, Metema, Nekemt and Addis Ababa). During such a visit, all traders present were asked to participate. Although some traders refused to participate (some 2-3 traders per locality), the majority participated after we explained that our enumerators were not working for the government and that all questionnaires were anonymous. Our response rate is approximately 70%. For the second

survey we visited the same 41 markets, and asked participating traders the same questions as in 2010. We also asked them whether they participated in the 2010 survey and, if so, we matched the responses.[13] Total participation in the first (second) survey amounted to 194 (196) traders, we were able to match 105 traders which constitutes the subsample for the panel analyses. We believe this constitutes a representative sample of traders in Ethiopia's sesame markets. While the total number of sesame traders is unknown (there is no trading license specifically for sesame), we know there are around 80 sesame exporters, of which 45 are contained in our sample.

In what follows, to bolster our identification strategy, we will often distinguish between 'exporters' and 'other traders.' Exporters operate within the realm of the ECX so that the full range of grading, enforcement, and arbitrage services is available to them. The group of other traders, in contrast, are individuals supplying at warehouses, and purchasing sesame from PTCs, small-scale sesame collectors or directly from producers. Such trades are beyond the scope of the ECX enforcement and arbitrage services. Since some of the trading activities of these 'other traders' are also governed by the ECX, this group is not a proper 'control group' for the 'treated' exporters. For that reason we will not present results based on a difference-in-differences methodology.[14] However, we do expect a gradient in exposure to ECX governance (with exporters more exposed than other traders), and examine whether this gradient translates into diverging dynamics with respect to social capital.

<< Insert Table 1 about here >>

[13] Because the identity of the respondents was not recorded during the second survey we matched traders across the two rounds based on other criteria that are specific to the trader and unchanging (or changing predictably): type of trader, age, age of business, education, and number of years in business. We assume that the combination of these variable is unique to a trader, and indeed we were able to unambiguously match 105 traders across rounds.

[14] Also note that these traders benefit from enhanced market transparency and universal price information.

In terms of demographics, the population of traders has not changed much (not shown). A small share of the traders in our sample is female (around 10%), and this percentage does not vary across survey rounds. Traders in the 2012 survey are on average two years younger than those in the 2010 survey (39 and 41 years, respectively, *p*-value = 0.008). However, as is evident from Table 1, the composition of the trader population has changed considerably. For example, in 2012, there were fewer exporters and more assemblers, reflecting (financial) requirements implied by ECX membership and a trend towards larger volumes. Most of the interviewed traders say they use the ECX through members, especially the wholesalers and assemblers. Hence, they do not sell directly on the ECX, but sell to other traders who are full or limited members. While most exporters have full or limited ECX membership, the picture for suppliers is mixed.

4.2 Social (Network) Capital

Consistent with the theoretical model outlined above, we will focus on various dimensions of social capital, and will measure social network capital by several indicators. First, following Fafchamps and Minten (2002), we consider the number of trading contacts and regular customers. If formal regulation reduces the risk of malfeasance, replacing trust and personal connections, then we would expect the number of trading contacts to expand as traders can now engage with a broader set of partners. Second, we asked whether and how much trade credit traders provide to their clients. Providing trade credit to other traders requires social capital, and can be used to create personalized relationships (Fisman and Raturi, 2004; Giannetti et al., 2011; Hermes et al., 2012). If less credit is extended in the sesame value chain, this might indicate an erosion of social (network) capital. Third, we measure the use of intermediaries such as selling and buying agents. Such intermediaries can substitute for social network capital (Gabre-Madhin, 2001; Quattri et al., 2012) so an increase in the use of intermediaries may signal a reduction in social

capital. In addition, we look at the 'nature' of the social relationship of traders with intermediaries. Fourth and finally, we measured trust perceptions of traders. Specifically, we measured their assessment of the trustworthiness of their partners (i.e. goodwill trust) and their appraisal of the ability of their partners (Das and Teng, 2004; Williamson, 1993).

4.3 Causal Effects and Attribution

Our main objective is to measure the impact of the ECX on traders' social capital. Our identification strategy is very simple, and consists primarily of a simple comparison of 'before' and 'after' social capital measures for various subsamples of traders. Since the time lag between the surveys was short (only 2 years) and we have been able to collect panel data for a subsample of our respondents (controlling for time-invariant characteristics), we hypothesize that significant differences over time may be attributed to the ECX. But we realize this is a strong assumption, and we will point out two issues that should be kept in mind when interpreting our data and results.

First, there is no genuine control group for the ECX as all sesame exports are traded on the ECX. Our before-after comparison picks up both the impact of ECX as well as other factors occurring between the survey waves. We attenuate concerns about the counterfactual by comparing the results for the category of exporters (trading in the ECX sphere of influence) with results for the category of 'other traders,' who also engage in trade elsewhere along the sesame value chain where trade is still governed by informal arrangements and social capital. We interpret different responses by exporters and other traders as suggestive evidence that impact may be attributed to the ECX's formal institutions.

Second, there are obvious and well-known challenges when conducting a survey with traders – which presumably explains why traders are a relatively 'under-researched' group of economic agents (Beck et al., 2008). For example, the precise number of sesame

traders in Ethiopia is not known (only exporters are registered), and many traders switch between markets in pursuit of price margins and marketing opportunities, rendering it difficult to revisit them and construct a panel. Moreover, some traders were reluctant to participate in the survey, mainly because they suspected the enumerators to work for the tax office. Next, traders are spatially scattered. While exporters usually have an office in town, and wholesalers usually have their own 'fixed' place in the oilseeds section of (regional) markets, many small-scale traders are dwellers on such markets and travel between different markets, or between producers, traders and markets.

5. Results

We now discuss how the formal institutions created by the ECX have impacted various dimensions of social capital for the 105 traders for whom we have collected pre-ECX (2010) and post-ECX (2012) data. We have also compared the 2010 and 2012 cross-section data (using all respondents, not just the panel subsample), to compare the characteristics of the *population* of traders over time. This nearly doubled the sample (improving the power), but of course makes attribution more difficult as we cannot control for time-invariant characteristics. Qualitatively, the results for the cross-section comparison support the panel results, but to economize on space are not reported here (details available on request).

5.1 Trading Contacts and the ECX

We speculate that the presence of formal enforcement and arbitrage institutions enables traders to engage in trade with a larger number of parties, no longer confining them to interact with an inner circle of trusted partners. In Table 2 we summarize panel data on the number of trading contacts, distinguishing between the full panel subsample and the two sub-types of traders. While at the aggregate level there is no evidence to suggest that the number of trading contacts has significantly changed after the ECX, we note that the

number of contacts in the purchase market has increased for the subsample of exporters. This is consistent with the expectation that exporters can more easily broaden their set of trading partners.

Consistent with our expectations, the same is not true for 'other traders' operating outside the governance system supported by the ECX. Indeed, the reverse seems true. While the number of contacts on the purchase side has stayed the same, the number of trading partners on the sales side has decreased—arguably reflecting overall consolidation in higher segments of the sesame value chain (due to increased fixed costs of trading via the ECX). In contrast, the mean number of trading contacts for exporters in sales markets increased from 4.5 to 6.1, but this increase is not significant. In what follows, we will focus on social capital among Ethiopian traders, and not on governance between exporters and importers (details about how the ECX affected governance on the sales side are available on request).

<< Insert Table 2 about here >>

We have also asked about the identity of trading contacts, and particularly whether the ECX affected the propensity to limit trade to 'regular customers and suppliers.' Table 3 shows that regular suppliers have become less important after the ECX. Aggregating across all traders, we find that in the ECX era, the number of regular traders and the proportion of sesame purchased from regular traders have gone down. Our respondents also trade less with friends (traders they meet socially) or close relatives – trading partners characterised by relatively low informal monitoring and enforcement costs (Gabre-Madhin, 2001). The same patterns emerge in the data when we consider customers (sales side of the market). These data suggest it has become less important for traders to have a network of regular customers and suppliers, as the ECX has taken over the role of the trading network, and that traders are investing less in maintaining social capital (by meeting socially with

regulars). When distinguishing between exporters and other traders, it is evident that these results are especially driven by developments among the subsample of exporters. Other traders still predominantly trade with the same regular partners as before, and continue to spend time with these partners outside business hours as well.

<< Insert Table 3 about here >>

5.2 Credit and the ECX

The extension of credit is an important part of social capital and personalized exchange in trading networks. We have two proxies for credit: the share of purchases associated with the extension of credit (via advanced or delayed payments), and a measure of the stated willingness of traders to extend credit to each other. Table 4 indicates that the share of commodities purchased on credit has decreased, and that 'payment on delivery' has become the dominant mode of purchasing (now covering some 72% of all trades). If we break this result down by distinguishing between exporters and other traders, a mixed picture emerges. Comparing baseline (2010) data, it is evident that exporters have always relied more on 'payment upon delivery' and less on the extension of credit to their partners than the category of 'other traders.' Nevertheless, suppliers' credit became even less important after implementation of the ECX (to a paltry 0.17% of all purchases), while suppliers' credit became significantly more important for other traders (from nearly 16% to 24% of all purchases). However, we also document that advance payments to traders became less important for 'other traders.' We believe this reflects the establishment of primary trading centres (PTCs), so that securing supply via brokers and small-scale traders has become less important. The decline in advance payments to farmers simply reflects that buying directly from farmers is now officially banned.

<< Insert Tables 4-5 about here >>

Table 5 provides information on the willingness of suppliers and customers to provide credit, and the willingness of the trader to provide credit. Consistent with the results above, and considering the full panel, we find that this willingness has decreased. Across the board, this seems true for both exporters and other traders, but 'other traders' are *more* willing to extend credit customers in 2012. Overall, the overall patterns in the data are consistent with the hypothesis that formal institutions crowd out informal ones, and curtail the extension of credit in informal trading networks. But we acknowledge that attributing these changes to the ECX is not straightforward as there is some evidence of a broad trend of reduced credit extension affecting both exporters and other traders.

5.3 Use of intermediaries

If social capital becomes less important, traders can more easily work through intermediaries. Hence, we expect that the number of buying agents and brokers used by the trader should increase, and that the interaction between traders and intermediaries becomes increasingly 'professional' – i.e., less closely governed by social interactions. The reduced importance of 'regular trading partners' was already established in Table 3. The results in Table 6 provide further support for this hypothesis. We observe that exporters have significantly increased the number of intermediaries via whom they trade, and that they seem somewhat less likely to meet such buying agents socially (even if the latter effect is not significant at the 10% level). Similar patterns in the data do not exist for 'other traders.'

<< Insert Table 6 about here >>

The share of goods purchased through an intermediary (buying agent) has increased. Distinguishing between exporters and other traders, we observe that this result is driven by both categories of traders, but also note that the exporters' share of goods purchased through a buying agent has especially increased (from5% to nearly 70%, compared to an increase from 15% to only 26% for 'other traders').

5.4 Trust and Disputes: Goodwill Trust and Trust in Ability

If formal institutions crowd out informal ones, we would expect that transactions are increasingly governed by rules rather than shared norms and trust. If so, we also expect an deterioration in (average) trust levels in the sesame value chain – not necessarily because traders suddenly distrust their existing trade partners, but because they have expanded the set of partners with whom they interact and trade. We distinguish between two types of trust: goodwill trust, or trust in the intentions of others, and trust in the ability of partners to produce or deliver as promised. Table 7 summarises traders' perceptions.

<< Insert Table 7 about here >>

Across the board, we indeed find that goodwill trust and trust in ability have decreased over time. Traders increasingly believe their partners may try to benefit from asymmetric information, and that their partners are unable to properly assess the quantity and quality of sesame they promise to deliver. This is due to the fact that quantity and quality is now assessed at the warehouses by warehouse managers, and corresponds with findings by Coulter (2012). One positive point is that traders see less collusion among the sellers from whom they purchase sesame—trust levels in this area have increased. One possible reason is that social capital may facilitate collusion (Adler, 2000; Fafchamps and Minten, 2002) so that a reduction in social capital may lead to lower levels of collusion.

Consistent with expectations, there are striking differences between exporters and 'other traders' in their trust perceptions. While exporters' perceptions of goodwill trust and trust in ability have significantly deteriorated across all dimensions, the same is not true for 'other traders.' Indeed, in contrast, average goodwill trust among these traders has increased, as has trust for specific dimensions (less cheating, less collusion). Trust in ability among other traders has not been affected robustly in either direction.

Turning to more general statements at the bottom of Table 7, it is interesting to note that traders argue that trust between traders has become less important, but is still highly valued. Traders also state it takes fewer years to trust other traders. This may both be a reflection of the ECX increasing transparency and decreasing contract default.

We have also looked at trade disputes in the sesame value chain. Specifically, Table 8 summarises the share of traders with trade disputes over various issues, and documents how often such disputes occur (as a share of all disputes). This Table substantiates anecdotal evidence about quality problems reported by Coulter (2012) and van den Broek (2012), and corroborates the results of low trust in quality hinted at in Table 7.

<<, Insert Table 8 about here >>

As expected, the ECX resulted in a reduction in disputes over renegotiation with suppliers (as when prices change quickly). The warehouse system also attenuated problems associated with stolen property. However, disputes over measuring units persist, and around a third of all traders reports this, although the actual number of disputes is low.

Breaking down the results between exporters and other traders, we again detect significant differences. Overall, exporters are more likely to report an increase in disputes, and indicate an increase in the share of disputes with suppliers due to bad quality, measuring units, or the place of delivery. However, they also reported a decreases in the shares of disputes due to disagreement over measurement or attempts to renegotiate. The overall conclusion is that the ECX has succeeded in bringing down the incidence of disputes in some areas, but has increased them in other areas. Given the fact that not all of the components of the ECX are functioning as expected (such as the quality control at warehouses), this is to be expected.

6. Conclusions

A small literature considers the multi-faceted relation between trade and trust. It is clear that trust fosters trade – for trade to extend beyond 'flea market' barter, moral obligations of fairness and reciprocity should extend to strangers, not just kith and kin. Generalized morality and trust enables expansion of markets (e.g., Qin and Bulte 2008). But, in turn, trade may also affect trust. For example, Henrich et al. (2010) argue that integration into markets (or the transition from personalized to anonymous exchange) is associated with higher levels of generalized trust. They propose that 'market norms may have evolved as part of an overall process of societal evolution to sustain mutually beneficial exchanges in contexts where established social relations (for example, kin, reciprocity, status) were insufficient' (p.1480). Hence, market integration 'involved the selective spread of those norms and institutions that best facilitated successful exchange…' (p.1484). If trade fosters trust, and trust fosters trade, then trade and trust are complements in development, enabling virtuous cycles of development.

However, trade and trust may not necessarily evolve hand-in-hand. For example, Kumar and Matsusaka (2009) emphasize the difference between 'village social capital' and 'market social capital.' Village social capital typifies rural economies in poor countries, capturing kinship ties, patron-client relations, and repeated personalised exchange governed by trust and reciprocity. In contrast, market social capital involves access to and knowledge about third-party punishment, including courts, auditors, credit ratings, and so on – or the type of formal institutions associated with the ECX and analysed in the current paper. To fully benefit from specialisation and trade, Kumar and Matsusaka argue, communities should adjust the composition of their social capital stocks—divesting in village capital and investing in market capital. If so, market integration and trust are

substitutes, rather than complements, in development. Tentative evidence provided by Siziba and Bulte (2012) supports this perspective.

In this paper we further probe the relation between formal institutions and informal institutions as mechanisms to govern trade. Focusing on the sesame value chain, we document evidence suggesting that the Ethiopian Commodity Exchange (ECX) has crowded out informal governance mechanisms – traders have expanded the set of parties with whom they trade, are less likely to extend credit to their partners, and are less likely to invest in 'social relations' with their trading partners. Moreover, traders express that trust has become less important following the creation of the ECX, and state that they trust their trading partners less than before. Moreover, these patterns in the data are more pronounced for exporters than for 'other traders,' which is consistent with the hypothesis that the crowding-out effects are especially pronounced for exporters who fully operate within the realm of the ECX (in contrast to 'other traders' who operate within and beyond the realm of the ECX).

We realize that methodological issues remain. The time lag between the creation of the ECX is very short, and attribution is far from perfect because a proper control group does not exist—no traders in the sesame value chainn are unaffected by the ECX. Hence our empirical results should be interpreted with care. Nevertheless, we believe them to be relevant. Commodity exchanges are an increasingly regarded as a powerful tool to promote agricultural development in developing countries, yet the impact of these institutions on traders is unclear. Indeed, we believe this is the first attempt to document the impact of commodity exchanges on social capital of traders – a crucially important yet chronically under-researched set of actors in the broader development debate.

If our tentative results hold up to future scrutiny and are replicated in different contexts, then policy makers should not be surprised if formal institutions (such as

commodity exchanges) that aim to enhance efficiency may, in fact, be counterproductive. For example, Dixit (2004) compares the outcomes of relational and formal contracting, and demonstrates that opportunities created by formal contracting may undermine the scope for relational contracting. Formal contracting may make first-best outcomes unattainable, so that overall efficiency deteriorates as formal institutions develop.[15] However, even in the absence of such counter-intuitive outcomes, it is important for policy makers to realize that formal and informal institutions interact, and that the expansion of formal contracts by new regulations or policies may invite the erosion of norms and informal rules in the same or adjacent domains of human interaction.

References

Access Capital. (2012). *Banking Sector Review 2011* (Investing in Ethiopia). Access Capital.

Adler, P. S. (2000). Chapter 5: Social capital: the good, the bad the ugly. In E. L. Lesser (Ed.), *Knowledge Social Capital: Foundations Applications*. Butterworth-Heinemann.

Ahlerup, P., Olsson, O., and Yanagizawa, D. (2009). Social capital vs institutions in the growth process. *European Journal of Political Economy*, *25*(1), 1–14.

Bigsten, A. P. Collier, S. Dercon, M. Fafchamps, B. Gauthier, J.W. Gunning, A. Oduro, R. Oostendorp, C. Patillo, M. Soderbom, F. Teal, and A. Zeufack (2000). Contract Flexibility Dispute Resolution in African Manufacturing. *Journal of Development Studies* 36: 1-37

[15] The mechanism explaining this counter-intuitive result is as follows: the harsher is the punishment facing deviators, the better the informal (repetitive) equilibrium that can be sustained. If formal contracting provides a fall-back option for deviating traders, then deviating will occur more often unless the scope for such behaviour is reduced by altering the terms of the informal contract. In other words, when the incentive contract is binding and the informal contract yields a second best outcome, then a partial improvement in formal institutions worsens the outcome of the informal contract.

Boettke, P. C. Coyne and P. Leeson (2008) Institutional Stickiness the New Development Economics. *American Journal of Economics Sociology* 67(2): 331-358

Caselli, F. (1997). Rural markets credit markets. Journal of Development Economics 54: 235-260

Coulter, J. (2012). *Review of WRS in Eastern Southern Africa - Ethiopia* (Unpublished Paper).

Das, T. K., and Teng, B.-S. (2004). The Risk-Based View of Trust: A Conceptual Framework. *Journal of Business Psychology*, *19*(1), 85–116.

Dixit, A. (2004). Lawlessness and economics. Princeton: Princeton University Press

ECX. (2011). Farmers become beneficiary of ECX warehouse receipt scheme. *Gebeyachin*, *1*(4).

ECX. (2012). *ECX Announces Solid End-of-Year Performance Results* (No. June 28, 2012). Addis Abeba: Ethiopia Commodity Exchange.

Fafchamps, M., and Minten, B. (2002). Returns to social network capital among traders. *Oxford Economic Papers*, *54*, 173–206.

FAOSTAT (2012). FAO Statistical Database: Trade. Rome: Food and Agriculture Organisation: http://faostat.fao.org/ (accessed February 4th, 2012)

Fisman, R., and Raturi, M. (2004). Does competition encourage credit provision? Evidence from African trade credit relationships. *The Review of Economics Statistics*, *86*(1), 345–352.

Gabre-Madhin, E. (2001). *Market Institutions, Transaction Costs, Social Capital in the Ethiopian Grain Market*. Washington D.C.: IFPRI.

Gabre-Madhin, E. (2009, August). *ECX… An Idea Whose Time Has Come*. Powerpoint presentation, Washington D.C.

Gabre-Madhin, E., and Goggin, I. (2005). Does Ethiopia need a Commodity Exchange? An integrated approach to market development (Working Paper No. 4). EDRI-ESSP Policy Working Papers (p. 26). Washington D.C.: IFPRI.

Giannetti, M., Burkart, M., and Ellingsen, T. (2011). What You Sell Is What You Lend? Explaining Trade Credit Contracts. *Rev. Financ. Stud.*, *24*(4), 1261–1298.

Goggin, I. (2006). What African governments can do facilitate a commodity exchange? In A. Gross (Ed.), *The world's commodity exchanges: past - present – future*. Presented at the 27th International SFOA Bürgenstock Conference, Bürgenstock: United Nations Conference on Trade Development. Swiss Futures Options Association.

Government of Ethiopia. (2010). *Regulation No. 178/2010 Sesame White Pea Beans Transaction Council of Ministers Regulation* (No. 178/2010). Council of Ministers, government of Ethiopia.

Henrich, J., Ensminger, J., McElreath, R. Barr, A., Barrett, C., Bolyanatz, A., Cardenas, J., Gurven, M., Gwako, E., Henrich, N., Lesorogol, C., Marlowe, F., Tracer, D., Ziker, J. (2010). Markets, religion, community size, and the evolution of fairness and punishment. *Science*, 327, 1480-1484.

Hermes, N., Kihanga, E., Lensink, R., and Lutz, C. (2012). The Impact of Trade Credit on Customer Switching Behaviour: Evidence from the Tanzanian Rice Market. *The Journal of Development Studies*, *48*(3), 363–376.

IFC and ECX. (2012). Session Summaries. Presented at the Warehouse Receipt Systems for Inclusive Agriculture Finance. June 4-5 2012, Addis Ababa.

Kingston, C. and. G. Caballero (2009). Comparing theories of institutional change. *Journal of Institutional Economics* 5(2): 151-180

Kumar, K.B. and J.G. Matsusaka (2009) From families to formal contracts: An approach to development. *Journal of Development Economics* 90, 106-119

Mason, N., T. Jayne, A. Chapoto and C. Donovan (2011). Putting the 2007/2008 global food crisis in longer-term perspective: Trends in staple food affordability in urban Zambia Kenya. Food Policy 36: 350-367

Narayan, D. and L. Pritchett (1999). Cents sociability: Household income social capital in rural Tanzania. *Economic Development Cultural Change* 47: 871–897.

Qin, T. and E.H. Bulte (2010). Trust, Market Participation and Economic Outcomes: Evidence from Rural China. *World Development* 38: 1179-119

Quattri, M., Ozanne, A., and Beyene, S. T. (2012). *The brokerage institution the development of agricultural markets: new evidence from Ethiopia* (No. 36). ESSP II Working Paper. Washington D.C.: IFPRI.

Rashid, S., and Negassa, A. (2011). *Policies Performance of Ethiopian Cereal Markets* (No. 21). Washington D.C.: IFPRI.

Sitko, N., and Jayne, T. S. (2012). Why Are African Commodity Exchanges Languishing: A Case Study of the Zambian Agricultural Commodity Exchange. *Food Policy*, *37*(3), 275–282.

Siziba, S. and E.H. Bulte (2012). Does Market Participation Promote Generalized Trust? Experimental Evidence from Southern Africa. *Economics Letters* 117: 156-160

Smale, M., D. Byerlee, and T. Jayne (2011). Maize revolutions in Sub-Saharan Africa. Policy Research Working Paper . 5659. Washington DC: World Bank

Tabellini, G. (2008). The scope of cooperation: Values and incentives. *Quarterly Journal of Economics*, 123, 905-950.

Van den Broek, J. (2012). *Overview ECX in Ethiopia*. Presented at the Food Security video conference organised by EKN Kigali 18 October 2012.

Wijnands, J., Biersteker, J., and Van Loo, E. N. (2009). *Oilseeds business opportunities in Ethiopia 2009* (p. 62). The Hague, The Netherls: Public Private Partnership on Oilseeds.

Williamson, C. (2009) Informal Institutions Rule: Institutional Arrangements Economic Performance. Public Choice 139: 371-389

Williamson, O. E. (1993). Calculativeness, trust, economic organization. *Journal of Law Economics, 36*, 453–486.

Figures

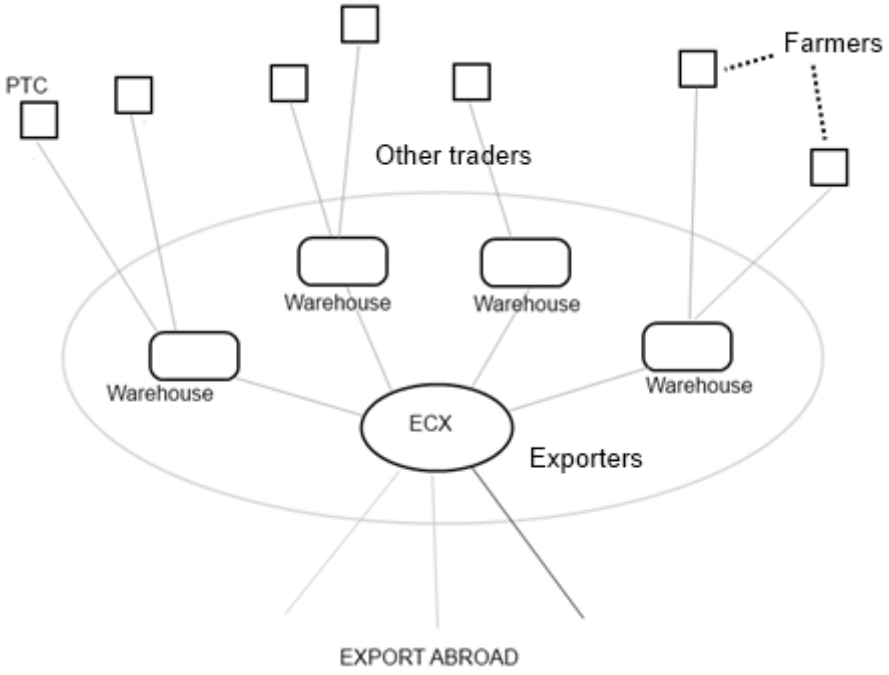

Figure 1:Stylised representation of the Ethiopian Commodity Exchange (ECX)

Tables

Table 1: Types of traders in the 2010 and 2012 surveys and in panel data (in numbers and percent of total number interviewed)

	2010 data		2012 data		In Panel	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Exporter	75	38.7	45	23.0	30	28.6
Wholesaler	71	36.6	80	40.8	51	48.6
Supplier	14	7.2	7	3.6	6	5.7
Assembler	18	9.3	52	26.5	14	13.3
Other type of trader	16	8.2	13	6.6	4	3.8
Total	194	100	196	100	105	100

2010 survey: N=194; 2012 survey: N=196; Panel data: N=105

Table 2: Number of trading contacts of all traders, exporters only and 'other traders' in the 2010 and 2012 surveys (panel data only)

	All traders			Exporters				Other traders			
Indicator	**2010**	**2012**	**p**	**2010**	**2012**	**P**		**2010**	**2012**	**p**	
Number of trading contacts in main purchase market	5.37	5.77	0.776	3.14	5.16	0.0995	*	6.35	6.12	0.905	
Number of trading contacts in main sales market	3.84	3.14	0.378	4.5	6.1	0.456		3.7	2.02	0.093	**

* indicates significance at 10%; ** at 5%; *** at 1%

N=105

Table 3: Data on regular suppliers for all traders, exporters only and 'other traders' in 2010 and 2012 survey (panel data only)

	All traders				Exporters				Other traders			
Indicators	**2010**	**2012**	**p**		**2010**	**2012**	**p**		**2010**	**2012**	**p**	
Number of regular suppliers	13.66	8.85	0.162		10.43	1.46	0.028	**	14.92	11.61	0.467	
Proportion of purchases with regular suppliers	49.90	29.59	0.001	***	68.80	25.00	0.000	***	43.74	31.32	0.056	*
Number of regular suppliers you meet socially	5.60	2.34	0.090	*	1.36	0.14	0.056	*	6.87	3.16	0.174	
Number of regular suppliers who are close relatives	1.30	0.53	0.223		0.00	0.04	0.326		1.65	0.72	0.439	
Number of suppliers who sell exclusively to you	5.18	2.02	0.001	***	3.73	0.36	0.009	***	5.52	2.64	0.040	

* indicates significance at 10%; ** at 5%; *** at 1%

N=105

Values are number of suppliers and proportion of purchases with regular suppliers in total purchases

Table 4: Different payment modes for all traders, exporters only and 'other traders' for 2010 and 2012 survey (panel data only)

	All traders				Exporters				Other traders			
Payment mode:	**2010**	**2012**	**p**		**2010**	**2012**	**P**		**2010**	**2012**	**P**	
suppliers credit	12.08	17.25	0.169		2.43	0.17	0.072	*	15.93	24.18	0.099	*
advance payment to traders	7.18	3.03	0.050	**	1.9	8	0.211		9.29	1.01	0	***
advance payment to farmers	16.94	5.59	0.000	***	2.47	1.67	0.687		22.73	7.18	0	***
payment upon delivery	58.87	71.63	0.020	**	83.8	83.5	0.972		48.89	66.82	0.006	***

* indicates significance at 10%; ** at 5%; *** at 1%

N=105

Values are shares of total purchases

Table 5: Credit received or advance given by all traders, exporters only and 'other traders' for 2010 and 2012 survey (panel data only)

	All traders				Exporters				Other traders			
	2010	**2012**	**p**		**2010**	**2012**	**P**		**2010**	**2012**	**p**	
Do suppliers let you buy on credit? [a]	2.13	1.42	0	***	2.31	1	0	***	2.067	1.59	0	***
Do you let customers buy on credit? [a]	1.74	1.35	0	***	1.1	1.1	1		1.203	1.44	0	***
Do you buy with advance to farmers? [b]	2.38	1.4	0	***	2.43	1.07	0	***	2.36	1.53	0	***
Do you buy with advance to traders? [b]	1.84	1.35	0	***	1.9	1.1	0	***	1.81	1.44	0	***

[a] 1= none; 2=some; 3=all. Values are average scores

[b] 1=never; 2=sometimes; 3=often; 4=always. Values are average scores

* indicates significance at 10%; ** at 5%; *** at 1%

N=105

Table 6: Number of intermediaries used in total purchases and relationships with those intermediaries for all traders, exporters and 'other traders' for 2010 and 2012 survey (panel data only)

	All traders				Exporters				Other traders			
	2010	**2012**	**p**		**2010**	**2012**	**p**		**2010**	**2012**	**p**	
Number of buying agents	0.58	1.66	0.000	***	0.4	0.88	0.045	**	0.65	0.95	0.197	
Number of buying agents you meet socially	0.29	0.46	0.197		0.25	0.12	0.493		0.31	0.51	0.293	
Number of buying agents that are close relatives	0.17	0.2	0.712		0.25	0.08	0.465		0.13	0.25	0.172	
Share of goods purchased via buying agent	12.08	34.42	0.000	***	5.17	69.17	0.000	***	15.32	25.6	0.000	**

* indicates significance at 10%; ** at 5%; *** at 1%

N=105

Table 7: Average scores for trust perceptions of all traders, exporters, other traders in 2010 and 2012 surveys (panel data only)

	All traders				Exporters				Other traders			
	2010	**2012**	**p**		**2010**	**2012**	**p**		**2010**	**2012**	**p**	
Goodwill trust												
Average trust in suppliers	3.15	3.14	0.955		3.94	2.46	0.000	***	2.81	3.44	0.001	***
Knows price well but not sharing info	3.33	3.13	0.268		3.96	2.57	0.001	***	2.79	3.16	0.119	
Know quality of produce but does not share info	3.25	2.69	0.004	***	3.96	2.57	0.000	***	2.87	2.75	0.615	
Knows quantity well but does not share info	3.28	2.84	0.038	**	3.89	2.71	0.001	***	2.98	2.89	0.721	
Able to pay but cheats	3.47	3.57	0.747		4.20	2.39	0.000	***	3.08	4.10	0.009	***
Colludes with other buyers/sellers suppliers	3.05	3.91	0.006	***	3.67	2.61	0.011	**	2.80	4.49	0	***
Trust in ability												
Average trust in ability of suppliers	3.34	3.06	0.081	*	3.96	2.66	0.000	***	3.09	3.23	0.400	
Does not know price well	3.16	2.98	0.405		3.96	2.96	0.000	***	3.00	3.21	0.348	
Does not know quality of produce	3.39	2.84	0.005	***	3.96	2.57	0.000	***	2.87	2.75	0.615	
Does not know quantity	3.56	2.62	0.000	***	4.00	2.39	0.000	***	3.39	2.71	0.010	***
Cannot pay you because of short of cash	2.82	3.36	0.163		2.92	2.25	0.292		2.79	3.86	0.008	***
General												
Importance of trust	4.04	3.71	0.021	**	4.45	4.10	0.097	*	3.88	3.56	0.065	*
How much do you trust traders in general	3.87	3.6	0.051	*	4.28	3.83	0.038	**	3.71	3.51	0.245	
How much do you trust buyer of last transaction	3.93	3.54	0.004	***	4.46	3.76	0.001	***	3.73	3.45	0.086	*
Number transaction you undertake before trust	3.85	3.43	0.103		3.81	3.10	0.171		3.86	3.52	0.269	
Number of years it takes to trust trade partners	2.81	1.45	0.000	***	2.40	0.95	0.001	***	2.96	1.58	0	***

1=very low trust; 2=low trust; 3= neutral; 4=high trust;5=very high trust. Values reflect averages for traders of these scores

Red highlights: increase; green highlights: decrease

* indicates significance at 10%; ** at 5%; *** at 1%

N=105

Table 8: Reported disputes by all traders, exporters only and 'other traders' in 2010 and 2012 surveys (panel data only)

	All traders				Exporters				Other traders			
Indicators	2010	2012	p		**2010**	**2012**	**p**		**2010**	**2012**	**p**	
Dispute with suppliers due to bad quality purchase	0.28	0.50	0.001	***	0.10	0.48	0.001	***	0.47	0.66	0.024	**
% Of all disputes with suppliers due to bad quality purchase	15.08	18.39	0.373		2.67	19.64	0.037	**	16.14	18.02	0.610	
Dispute with suppliers due to disagreement over measuring unit	0.22	0.22	0.89		0.07	0.28	0.039	**	0.31	0.30	0.902	
% Of all disputes with suppliers due to disagreement over measurement	9.40	8.17	0.615		5.00	3.00	0.022	**	9.78	10.05	0.926	
Dispute with suppliers due to attempt to renegotiate	0.40	0.19	0.000	***	0.76	0.10	0.000	***	0.87	0.37	0.000	***
% Of all disputes with suppliers due to attempt to renegotiate	11.24	15.67	0.108		13.09	2.67	0.009	***	10.57	17.11	0.035	**
Dispute with suppliers due to stolen property	0.06	0.03	0.133		0.03	0.00	0.326		0.11	0.06	0.240	
% Of all disputes with suppliers due to stolen property	3.11	4.00	0.396		0.17	0.00	0.326		2.88	4.00	0.224	
Dispute with suppliers due to place of delivery	0.25	0.13	0.003	***	0.17	0.21	0.743		0.39	0.12	0.000	***
% Of all disputes with suppliers due to place of delivery	6.62	19.87	0.002	***	3.40	32.67	0.034	**	7.17	11.33	0.471	

* indicates significance at 10%; ** at 5%; *** at 1%
N=105

The value for disputes is a binary variable (yes/no) and measures the proportion of traders indicating they have had such a dispute. % of all disputes reflects how important the particular dispute was compared to all disputes a trader may have had (in %).