Property Rights in a Flea Market Economy

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February 1999

Abstract[1]

This paper studies liberalized grain markets in Madagascar and examines how property rights are protected and contracts are enforced among agricultural traders. We find that the incidence of theft and breach of contract is low and that the losses resulting from such instances are small. This, however, does not result from reliance on legal institutions -- actual recourse to police and courts is fairly rare, except in cases of theft -- but from traders' reluctance to expose themselves to opportunism. As a result, Malagasy grain trade resembles a flea market, with little or no forward contracting and high transactions costs. The dominant contract enforcement mechanism is trust-based relationships. Trust is established primarily through repeated interaction with little role for referral by other traders. Information on bad clients does not circulate widely, hence severely limiting group punishments for non payment.

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[1] We benefitted from conversations and comments from Jean Claude Randrianarisoa and Eliane Ralison. Special thanks go to Ousmane Badiane for obtaining funding for this research. We acknowledge financial support for data collection from the United States Agency for International Development.

Since North's (1973, 1990) seminal work on the development of capitalism in Europe, the fundamental role that market institutions play in economic growth has become increasingly recognized. In particular, North argued that individual property rights need to be protected from theft and embezzlement as well as from arbitrary expropriation by agents of the state. In addition, institutions such as lawyers and courts must exist that ensure compliance with contractual obligations and deter opportunistic breach of contract. These ideas have largely shaped the research and policy agenda for transition economies and developing countries alike (e.g., Benson (1990), Baer and Gray (1995), Hendley, Murrell and Ryterman (1998), McMillan (1996), Fafchamps (1996)). They have also spawn new and insightful research in the various forms that market institutions have taken over the course of human history (e.g., Ensminger (1992), Greif (1993, 1994), Milgrom, North and Weingast (1991)).

This paper studies whether institutions exist in present day Madagascar that protect property rights and ensure contract compliance among grain traders. Madagascar is a particularly suitable place to study market institutions at early stages of development because, until recently, grain trade was entirely under state control (e.g., Barrett (1997a, 1997b), Dorosh and Bernier (1994), Berg (1989)). At the same time, the island has kept much of the French legal code and judicial system that it inherited from colonisation. Malagasy commercial law may be a little dated, not having been overhauled since independence (e.g., Root (1993)). But it is likely to be quite superior to the legal environment that prevails in most transitional economies. Liberalized grain trade in Madagascar thus constitutes an interesting test case of the role of law *per se* in the development of efficient markets and it provides a unique window on the early development of markets when laws are adequate. An analysis of the functioning of Madagascar grain markets should therefore supply useful insights on the likely effect of legal reform in transition economies at a similar level of development.

Using data from a trader survey that we designed and collected ourselves, we show that the incidence of theft and breach of contract is low among Malagasy grain traders and that the losses resulting from such instances are small. At prima facie these results suggest that market institutions work well. A closer look at the evidence, however, reveals that low incidence of theft and contractual breach is achieved essentially through low exposure. Theft is rare because many traders do not stock the goods they sell and, if they do, they go to great length ensuring that their stocks are protected -- e.g., by sleeping in their store. Econometric analysis confirms that overnight storage is a significant risk factor in theft incidence. Among those to transport grain from town to town, payment of protection money and travel in convoy are common -- presumably against the risk of highway robbery that is endemic in certain parts of the country. Surveyed traders even declare refraining from hiring additional workers for fear of employee-related theft.

The situation regarding contract compliance is similar. Malagasy traders limit their exposure to potential breach of contract by adopting commercial practices that leave little room for abuse. Most transactions take a simple cash-and-carry form. Supplier credit is infrequent, and the placement of orders is uncommon. Payment by check and invoicing are virtually unheard of. Traders personally inspect the quality of goods purchased in nearly all transactions. Econometric analysis indicates that exposure is the dominant risk factor in all cases of contractual breach.

Survey results further show that recourse to legal institutions is rare, but that it increases with the severity of the dispute. The use of police and courts is indeed highest in theft cases and lowest in late delivery and deficient quality cases, with non-payment by clients in between. Direct negotiation with the other party is the dominant conflict resolution method in contractual disputes. Traders' propensity to solve disputes and to resume trade with each other is shown to depend critically on the use of direct negotiations with the other party. Recourse to negotiations in turn depends on the strength of the relationship between trading partners. These results are broadly similar to those reported by Bigsten et al. (1998) for African manufacturing. They confirm Fafchamps and Minten's (1998a) earlier conclusion that relationships play an important role in the resolution of contractual disputes among Malagasy traders.

Finding that legal institutions do not play an important role in the enforcement of contracts begs the question of which alternative mechanism is used by Malagasy traders. Our analysis suggest that trust-based relationships are the dominant contract enforcement mechanism among grain traders. Trust is established primarily through repeated interaction with little role for referral by other traders. Information on bad clients does not circulate widely, hence severely limiting group punishments for non payment. The lack of information sharing does not result from the existence of linguistic, ethnic, or religious obstacles to communication. Rather, it may be due to the disruption of pre-existing Asian networks following food riots in the late 1980's (e.g., Blanchy (1995)). Why native networks did not emerge in their stead remains a mystery, however.

To summarize, grain trade in Madagascar ressembles a flea market more than the sophisticated business world that proponents of market liberalization typically envision. Although the direct costs of theft and contractual breach appear low, the methods that surveyed traders use to minimize risk exposure can but add to transactions costs. The need for traders to personally inspect quality on each delivery, for instance, combined with their unwillingness to delegate quality control to subordinates and with their reluctance to hire additional workers for fear of theft, undoubtedly restrict firm size and firm growth. The need to guard stocks in person, the total absence of payment by check (that adds to the risk of theft), the infrequent use of trade credit, and the difficulty of placing orders complicate the conduct of business and make trade very labor and management intensive.

The transactions costs of trade are ultimately paid by producers and consumers in the form of a larger spread between farm-gate and retail price (e.g., IFPRI (1998)). The welfare cost of flea markets is thus not negligible. In addition, judging from the extreme dispersion in firm size (Gini coefficient of total sales around 0.75) and the fact that better connected traders economize on transactions costs and reap higher sales and profits (e.g., Fafchamps and Minten (1998a)), it is far from clear that competition yields efficiency. Indeed, Fafchamps and Minten's (1998b) finding that traders with better social network capital make more profits suggest that they do not take advantage of their lower costs to drive out small, unconnected traders. In other words, in a flea market economy, the coexistence of a large number of atomistic firms with a small number of large, well connected traders should not be taken as an indication that competitive forces are sufficient to eliminate rents (see Barrett (1997b) for a similar observation). This is because, among other things, small traders' efforts to protect their property rights and avoid being cheated leads to high transactions costs.

The rest of this paper is organized as follows. We begin in Section 1 with a brief description of the surveys. Section 2 follows with an analysis of the incidence of theft and breach of contract. Regression analysis is presented that tries to identify their determinants. Deterrence and contract enforcement mechanisms are discussed in Section 3.

this figure -- and its likely welfare cost in an economy where underemployment is rampant and trade is a major source of employment -- perfectly illustrates the idea that the indirect costs of malfeasance are potentially much larger than its direct costs (see Hart (1988) for a similar observation). Table 3 also shows that, among traders who stock agricultural products at night, two third sleep on the premices. Virtually all overnight storage is both locked and guarded. Of those traders who transport goods from one town to another, 43% either pay for protection or travel in convoy.[4] In addition, thirteen traders -- all from the same province (Fianaranatsoa) -- declare avoiding certain routes for fear of highway robbery.

A similar picture emerges for quality control. Table 4 indicates that prices vary with product quality. For instance, the price differential between the two most traded rice qualities oscilate between 8% and 9% in the capital city. Some of this quality variation is due to differences in traditional crop varieties across regions.[5] This source of quality variation can presumably be controled by traders simply by verifying the geographical origin of the goods they buy. Some of the variation in quality, however, does not come from regional differences but from improper handling[6] and from natural variation in traditional seed material, thereby making it harder to ascertain. Taken together, the evidence indicates that price varies with quality and that quality cannot be perfectly inferred by a product's region of origin. As table 4 shows, the overwhelming majority of surveyed traders and their clients respond to quality risk by inspecting each and every purchase.

[4] Interestingly, only two traders report doing both.

[5] Unlike in advanced economies where most food is produced from a handful of highly homogeneous improved seeds, farmers in Madagascar as well as in much of the tropics rely on their own output for seeds. This process results in widespread dispersion in genetic traits and output characteristics across regions and even villages.

[6] E.g., high moisture content, fungus and pest damage, brokens, presence of stones and sand.

The importance of quality inspection is further underscored by the fact that the task is virtually never delegated to family helpers, employees, or collecting agents. Although we did not attempt to measure the time actually spent on quality verification by Malagasy traders, casual observation suggests that the process can be very time consuming. Furthermore it requires that the trader be present at each purchase, thereby complicating the conduct of business and requiring extensive travel on the part of the trader himself or herself.

A similar pattern is observed with respect to other sources of breach of contract: 85% of surveyed traders never place orders from suppliers; and 54% never give credit to customers. In addition, payment by check is unheard of; all transactions are strictly cash.[7] they complicate transactions and the planning of business.

However costly, these efforts are in general effective in minimizing the incidence of malfeasance. As indicated by Table 5, simple *t* tests indicate that not storing overnight all but eliminates the risk of theft. Not placing orders cancels the risk of late delivery, and not giving credit to clients dramatically reduce the risks of late and non payment. The results reported in Table 5 may, however, be unreliable because they ignore the effect of other possible determinants of malfeasance, such as regional differences in incidence, and the likely endogeneity of prevention.

We therefore complement the bivariate analysis reported in Table 5 with a multivariate regression analysis that controls for possible endogeneity. Results regarding theft are presented in Table 6.[8] The dependent variable is the value of annual losses due

[7] The use of check is absent even of credit transactions, presumably because Malagasy banks are notoriously slow in processing payments and transfers. At the time of the survey, it alledgedly took two to three weeks for banks to transfer funds from agencies of the same bank located in two different towns.

[8] To control for the possibility that results are driven by outliers (see large 'Maximum' frequencies in Table 2), all regressions on determinants of theft and breach of contract were reestimated after dropping all

to theft as a proportion of annual sales. The first column examines the determinants of theft incidence without conditioning on risky behavior. Explanatory variables include total sales (to control for size), human capital (measured by years of schooling and the log of years of trade experience), and location dummies. Presumably, larger firms may experience more theft because they process a larger volume of goods and find it harder to control their employees. Total sales are instrumented to control for the possible feedback effect that theft may have on sales.[9] Human capital is included to control for the possibility that smarter, more experienced traders might be better able to prevent theft. Location variables control for general crime environment and other spatial effects. Insecurity is generally perceived to be highest in the Majunga plaines region and fairly high in the Majunga plateaux region. We would therefore expect theft to be more problematic in these regions. Results show that firms that sell more face more theft. Other variables are not significant.

We then introduce risk factors such as overnight storage and storage capacity as additional regressors (second column of Table 6). As expected, results show that traders who store overnight are more at risk. The magnitude of the coefficient is very large. Storage capacity has the expected sign but its *t* value is below standard levels of significance. As anticipated, the risk of theft is much larger in the two Majunga regions, and largest in the region where insecurity is generally perceived to be highest. Experimentation with other regressors suggests that transporting raises theft incidence and that sleeping in one's store reduces it, but the effects are no longer significant once location

frequencies larger than 10%. Qualitative results are unchanged, but estimated parameter are in general smaller in magnitude.

[9] The instrumenting equation is presented in appendix A. Instruments include various measures of physical and working capital, labor and management, social network capital, enterpreneurial traits and family background, and aggregate shocks. See Fafchamps and Minten (1998b) for more details.

dummies are included in the regression.[10] To control for possible endogeneity, we then instrument risky behavior variables and replace them by their predicted value.[11] Results are presented in the third column of Table 6. They confirm that risky behavior raises the incidence of theft. The effect of regional dummies is unchanged.

We run similar regressions for various forms of breach of contract. To control for network capital effects, we include as additional regressors the (log of the) number of close relatives in agricultural trade and the number of suppliers and clients known personally by the respondent. Fafchamps and Minten (1998b) indeed demonstrate that better connected traders not only make more profits but also are more likely to place orders and to give and receive trade credit. Following much of the literature (e.g., Fukuyama (1995), Kranton (1996), Greif (1993), North (1990)), they hypothesize that social connections mitigate opportunism. Regional dummies are included to capture possible differences in road infrastructure, climate, and other location specific factors. Road quality is best in and around the capital city, and in Majunga plaines; it is by far the worst in Majunga plateaux and also fairly low in Fianaranatsoa. To the extent that late delivery is due to problems during transport, we would therefore expect late delivery to more prevalent in these regions. Rainfall is most abundant in the Fianaranatsoa cotes et falaises region and in Vakinantaratra; it is lowest in Majunga. Since deficient quality is often related to imperfect drying, we would expect quality to be more problematic in humid regions.

Regression results are presented in Tables 7 to 10. Except for the verification of quality, which has the right sign but is not statistically significant,[12] the coefficients of all

[10] The fact that robust results are difficult to obtain with more regressors is not altogether surprising given that there are only 57 non-zero observations.

[11] Instrumenting equations are presented in Appendix B. Instruments include personal wealth, age, and sex of the owner, social network capital, personal traits, and family background.

[12] Quality verification is significant when location dummies are omitted.

risk factors have the right sign and are significant. Contrary to expectations, traders with family members in agricultural trade appear to face a higher incidence of contractual breach. For deficient quality and for non-payment, the effect is significant even after we control for risky behavior. This suggests that having more relatives in trade favors contractual opportunism, presumably because traders find it difficult to discipline relatives who operate as suppliers or clients. This may explain why Fafchamps and Minten (1998b) find that respondents with more relatives in agricultural trade get significantly lower profits after controling for all factors and inputs.

Results also indicate the presence of very strong regional differences in the incidence of breach of contract, even after we control for urbanization level. Contrary to expectations, however, we do not find that regions with inferior road infrastructure have more late delivery problems and that wetter regions have more deficient quality cases. If anything, Majunga plateaux, the region with by far the poorest road infrastructure, has *less* late delivery cases than other regions, and the Fianaranatsoa cotes et falaises region, which is the most humid, has *fewer* cases of deficient quality. Results indicate that Antananarivo and the region surrounding it (the omitted region dummy) have more late delivery problems. This possibly reflects the fact that the capital city is a major food deficit area where the urgency of the market is felt more strongly than elsewhere.

Contrary to expectations, econometric results do not suggest that quality problems are more frequent in the most humid area, the Fianaranatsoa cotes et falaises region. If anything, quality deficiencies are highest in the Vakinankaratra and Antananarivo regions (the omitted region dummy), two areas of moderate to high rainfall. In terms of payment by clients, the incidence of breach of contract appears to be significantly higher in the rural areas surrounding the capital city. The reason for these regional differences is unclear.[13] One possibility is that they correspond to different equilibria of a flexible contract enforcement game. This issue deserves more research.

To summarize, we have shown that the incidence of theft and contractual breach is low but also that Malagasy grain traders go to great length to reduce their exposure to malfeasance. Regression analysis demonstrated that prevention is effective in the sense that traders who opt for more risky trading practices face a higher incidence of malfeasance. The question now remains of why prevention is the dominant method grain traders use to reduce risk. To answer this question, we now examine what happens when a theft or a breach of contract actually occur.

Section 3. Legal Institutions and Deterrence

Recourse to the police is relatively frequent in cases of theft: as shown in Table 11, one third of theft cases were reported to the police, and respondents went to court -- presumably as witnesses -- in ten percent of the theft cases. Calling upon the police had no noticeable effect on the probability to recover stolen item, however: of those traders who went to the police, 24% retrieved all or part of the stolen goods; of those who did not, 34% retrieved something. The difference is not statistically significant (t value of 0.81). The small number of observations (57 cases of theft) precludes further analysis.

We have a little more information on contractual disputes with suppliers and clients. Surveyed traders were asked whether they ever called upon an intermediary to mediate their contractual disputes with suppliers or clients, and whether they ever went to the police, a lawyer, or a court in relation with a purchase or sales dispute. Their responses,

[13] Differences in the function (e.g., collector, wholesaler, retailer, or microretailer) exercised by the respondent or in the crops they sell, do not, for instance, account for these regional differences.

listed in Table 11, show that, apart from an occasional recourse to the police, the use of legal institutions by Malagasy grain traders is extremely low in contractual disputes with suppliers and clients.

One conceivable interpretation of these numbers is that legal enforcement in Madagascar is so effective and predictable that parties rationally anticipate the outcome and prefer to settle beforehand to avoid litigation costs. Table 11 indeed indicates that direct negotiations are the instrument of choice to resolve contractual disputes. Mediators are used occasionally as well. But the data also show that the threat of recourse to the police or to courts is extremely rare. In addition, these threats tend to be used only in desperate circumstances. Of the eight cases in which a threat of police action was mentioned, for instance, five were relative to non-payment by a client. Finally, surveyed traders hardly ever seek the advice of a lawyer. Taken together, these observations suggest that the threat of court action is not an important deterrent of contractual opportunism in the Malagasy grain market. Yet, lack of familiarity with courts and legal institutions does not seem to be the main reason for lack of usage: the fact that one third of robbed traders went to the police and 11% went to court do not suggest reluctance for legal institutions *per se*. What the data therefore indicates is that contractual obligations are largely seen as outside the purview of the law -- with the possible exception of non-payment.

This interpretation begs the question of what is the alternative contract enforcement mechanism: if legal institutions offer little or not protection against opportunistic breach, why do surveyed traders bother to place orders and grant credit at all? One thing that is quite clear from interviews is that violence is not seen as a common or even correct way of resolving contractual disputes. If anything, recourse to courts and police is low because traders perceive these institutions to be too antagonistic and conflictual. Reference to ’trust’ is the most common answer when traders are asked why contracts are honored. To understand what ’trust’ means to Malagasy traders, we investigate what happens in dispute cases. The first striking finding is that most contractual disputes are resolved (85% of supplier cases and 79% of client cases) and trade is resumed in most cases (91% of supplier cases and 78% of client cases). In addition, dispute resolution and resumption of trade are highly correlated; 79% of disputes with suppliers and 73% of disputes with clients are resolved and trade resumed. Similar findings are reported for African manufacturers in Fafchamps (1996) and Bigsten et al. (1998).

This suggests that breach of contract, although unwelcome and costly for respondents, occurs within the context of long term relationships. A reasonable interpretation, largely confirmed by informal discussions with respondents and casual observation, is that parties implicitly agree to continue trading with each other as long as contractual breach remains infrequent and provided that, when it occurs, a good faith effort is made to resolve the situation. If these conditions are satisfied, the relationship continues; otherwise it is severed. In other words, relational contracting as modeled for instance by Ghosh and Ray (1996) and Fafchamps (1998a) is the key contract enforcement mechanism.

This interpretation is confirmed by regression analysis. Table 12 for instance shows that more personalized relations and longer acquaintance with suppliers and clients is associated with efforts to resolve contractual disputes through direct negotiation and, in the case of clients, through mediators. A contrario, regression results also indicate that respondents with relatives in agricultural trade are much less likely to negotiate payment problems with clients. Although a priori surprising, this finding is consistent with the idea that disciplining relatives is difficult: if so, why bother waste time negotiating with them. Table 13 and 14 further illustrate that direct negotiations have a strong positive effect on the probability of resolving the dispute and resuming trade. In other words, good faith efforts to iron out difficulties are essential to the preservation of trust and relationships. Results again show that payment problems are less likely to be resolved for respondents who have relatives in agricultural trade -- and who presumably buy and sell from them.

The reader may want to know whether relational contracting as enforcement mechanism is complemented by information sharing on cheaters and by collusion to exclude them from future trade, as suggested for instance by Kandori (1992), Greif (1993), and others. Table 15 provides some useful information in this respect. We see that, of those traders who obtain supplier credit, less than one fifth come recommended by other traders. The dominant credit screening procedure is to purchase several times from the same trader, thereby establishing mutual trust. The most common action taken in response to non payment is to stop deliveries. Similar findings are reported by Fafchamps (1996) for Ghana. Very few respondents expect to involve the police or the courts in debt collection, hence confirming that the trade relationship constitutes its own collateral. There is some information sharing about clients who do not pay but its reach is limited: a majority of respondents estimate that a client who does not pay is unlikely or very unlikely to lose credit from other suppliers. Exclusion from future trade credit is thus not the dominant form of contract enforcement, although it plays a secondary role.

These findings are further confirmed by Table 16. Clients themselves are the main source of information on which suppliers rely before granting credit. For two third of the respondents, this is the only source of information on which they rely for screening trade credit applicants. Only a quarter of the respondents obtain information from other traders; 14% obtain information from other sources. There appears to be no systematic effort to share information on clients who do not pay: only 13% of credit givers discuss bad clients with other traders once of month or more; one quarter never discuss bad clients at all.

Why there is not more information sharing is unclear. One may be tempted to assume that the ethnic origin of traders is too heterogeneous to allow a fluid exchange of information (e.g., Cornell and Welch (1996), La Ferrara (1997)). This is not borne out by the data, however. First, all surveyed traders -- like all inhabitant of Madagascar -- speak a single common language. Second, traders operate predominantly in their region of origin: over 85% of traders operate in the district (Fivondronana) of their birth, and the coefficient of correlation between the postal code of their place of birth and the location of their trading activity is as high as 0.76. Only 9 traders in the sample are of foreign origin -- mostly from Asia. Finally, the overwhelming majority of respondents -- 91% -- share a common religion. The idea that linguistic, ethnic, or religious barriers prevent the circulation of information cannot, therefore, be sustained.

One item of information that is worth pointing out is that riots against traders took place in the late 1980’s. According to Lonely Planet (1994), "Indo-Pakistani traders [] bore the brunt of Malagasy violence in the 1987 riots. [T]he Indian premises on either sides [of the main street in Tulear] along with most of the central area were gutted" (p.220). Blanchy (1995) reports that in five major cities, Asian owned shops were looted and burned; many Asians feared for their life and fled the country, if only temporarilly. Barrett (1997b) reports that Asian traders refused to be interviewed by Malagasy enumerators and writes that "[it] is difficult to overstate the sensitivity of ethnic Asian food marketing intermediaries to the political risks of their trade". Judging from

Blanchy's (1995) account of Asian businesses in Madagascar, ethnic Asian business networks prior to the riots ressembled their counterparts in Kenya (e.g., Himbara (1994), Marris (1971), Fafchamps (1998b), Fafchamps et al. (1994)). If, as it is likely, Asian traders have pulled out of grain markets to reduce their exposure to political risk, the resulting disruption in existing business networks could explain the current lack of sophistication of grain trade in the country. Still, this does not explain why indigenous networks of information sharing have not formed to replace Asian networks them. These issues deserve more research.

Conclusions

This paper has studied liberalized grain markets in Madagascar and examines how property rights are protected and contracts are enforced among agricultural traders. We found that the incidence of theft and breach of contract is low and that the losses resulting from such instances are small. This, however, does not result from reliance on legal institutions -- actual recourse to police and courts is fairly rare, except in cases of theft -- but from traders' reluctance to expose themselves to opportunism. Judging from the evidence collected, the indirect costs of malfeasance prevention are likely to be much higher than the direct costs of theft and breach of contract. As a result, Malagasy grain trade resembles a flea market, with little or no forward contracting and high transactions costs.

We also investigated how contracts are enforced. We found that the dominant contract enforcement mechanism is trust-based relationships. Trust is established primarily through repeated interaction with little role for referral by other traders. Information on bad clients does not circulate widely, hence severely limiting group punishments for non payment. As far as we are able to judge, the lack of information sharing does not result from the existence of linguistic, ethnic, or religious obstacles to communication. In spite of great diversity in external appearance, Malagasy society is surprisingly homogeneous. Rather, the culprit might be sought in the disruption of pre-existing Asian networks that followed food riots in the late 1980's. More research is needed to assess why native networks did not emerge in their stead and what institutional changes can improve Malagasy grain markets.

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Table 1. Characteristics of Surveyed Traders

	Unit	Mean	Std. dev.
A. Dependent variables			
Total annual sales of agricultural food products	US $ (1)	39337	102087
Total annual value added	US $ (1)	5862	21731
B. Capital and equipment			
Working capital	US $ (1)	2061	7635
Dummy if subsidiary	Yes=1	4.7%	
Value of equipment	US $ (1)	399	2088
Storage capacity	Metric tons	26	134
Number of vehicles	Number	0.14	0.50
Utilization of telephone	Yes=1	16.2%	
C. Labor and management			
Manpower (in months/year)	Month/year	39.5	131.8
Dummy if full time trader	Yes=1	87.3%	
Dummy if trader all year round	Yes=1	83.4%	
Years of schooling of owner/manager	Years	9.1	3.5
Years of experience in agricultural trade	Years	6.0	4.5
Commonly speaks a language other than national language	Yes=1	42.8%	
Gender of trader	Female=1	45.7%	
D. Social capital			
Number of relatives in agric. trade	Number	0.7	1.2
Number of traders known	Number	8.8	9.1
Number of people who can help	Number	2.3	1.7
Number of suppliers known personally	Number	4.6	7.6
Number of clients known personally	Number	8.6	14.2
E. Location			
In capital city	Yes=1	15.7%	
In another city	Yes=1	31.3%	
In Vakinankaratra region	Yes=1	19.9%	
In Fianar/hauts plateaux region	Yes=1	24.9%	
In Fianar/cotes et falaise region	Yes=1	11.5%	
In Majunga/plaines region	Yes=1	12.2%	
In Majunga/plateaux region	Yes=1	13.4%	

(1) Computed using an exchange rate of 5000 Francs Malgaches for 1 US$.

Table 2. Incidence of Theft and Breach of Contract

	Mean	*Min.*	*Max.*
1. Theft			
Traders who experienced theft in last 12 months	7.70%		
Value of stolen goods relative to annual sales	0.28%	0.0%	93.0%
2. Late delivery by suppliers			
Traders who experienced late delivery in last 12 months	8.81%		
Proportion of late deliveries in total transactions	1.56%	0.0%	100.0%
3. Deficient quality of deliveries by suppliers			
Traders who experienced deficient quality in last 12 months	20.60%		
Proportion of deficient quality deliveries in total transactions	4.44%	0.0%	100.0%
4. Late payment by clients			
Traders who experienced late payment in last 12 months	30.80%		
Proportion of late payments in total transactions	1.91%	0.0%	100.0%
5. Non-payment by clients			
Traders who experienced non payment in last 12 months	6.82%		
Proportion of non payments in total transactions	0.04%	0.0%	4.2%

Note: the exact number of valid observations varies somewhat from question to question (from 728 to 738).

Table 3. Exposure to Theft and Prevention

Traders who experienced a theft in last 12 months	8%
Of those who experienced a theft:	
% who experienced theft at store during the day	42%
% who experienced theft from storage at night	40%
% who experienced theft during transport/consignment	18%
Of those who experienced a theft:	
% who think theft was not due to employee	32%
% who suspect an employee	37%
% who do not know	26%
Traders who refrain from hiring workers for fear of theft	37%
Traders who leave stocks overnight at sales location	72%
Of those who stock overnight:	
% with lock on storage location	99%
% who sleep on premices	64%
% who hire a guard	52%
% who either sleep on premices or hire a guard	95%
Traders who transport goods from one town to another	41%
Of those who transport:	
% who avoid certain locations for fear of theft during transpor	4%
% who pay someone for protecting goods in transport	14%
% who travel in convoy	30%
% who either pay for protection or travel in convoy	43%

Table 4. Variation of Quality and Inspection by Trader

Traders' assessment of quality variation	
1. Whether prices vary with product quality	
A lot	33%
A little bit	61%
Not at all	7%
2. Whether product quality varies by region of origin:	
A lot	37%
A little bit	57%
Not at all	6%
3. Whether product quality varies within region of origin:	
Always	5%
Often	14%
Sometimes	37%
Seldom	36%
Never	7%
Average price differential between C1 and C2 quality rice (a):	
Retail price	9%
Wholesale price	8%
Verification of quality before purchase:	
1. Trader verifies quality:	
Always	84%
Often	13%
Sometimes	2%
Never	1%
2. The person who verifies quality is:	
Trader himself/herself	93%
Family helper	4%
Employee or collecting agent	2%
Nobody	1%
3. Client verifies quality:	
Always	85%
Often	11%
Sometimes	2%
Never	2%

(a) Source: National Statistical Bureau, computed from dayly price figures fo Antananarivo, 1997.

Table 5. Exposure and Incidence

1. Theft and storage				
Trader leaves stocks overnight on sales location	*Yes*	*No*	*t-stat.*	*p-value*
Value of stolen goods relative to annual sales	0.38%	0.00%	**-1.9016**	0.0578
Number of observations	526	198		
2. Theft and transport				
Trader transports goods from one location to another	*Yes*	*No*	*t-stat.*	*p-value*
Value of stolen goods relative to annual sales	0.28%	0.28%	-0.0268	0.9786
Number of observations	307	423		
3. Late delivery by suppliers				
Trader places orders with suppliers	*Yes*	*No*	*t-stat.*	*p-value*
Proportion of transactions with late delivery	10.55%	0.00%	**-5.8100**	0.0000
Number of observations	108	620		
4. Deficient quality of deliveries by suppliers				
Trader always inspects quality of supplies	*Yes*	*No*	*t-stat.*	*p-value*
Proportion of transactions with deficient quality	4.19%	5.76%	0.9070	0.3660
Number of observations	616	112		
5. Late payment by clients				
Trader grants credit to at least some clients	*Yes*	*No*	*t-stat.*	*p-value*
Proportion of transactions with late payment	3.77%	0.33%	**-4.3800**	0.0000
Number of observations	336	396		
6. Non-payment by clients				
Trader grants credit to at least some clients	*Yes*	*No*	*t-stat.*	*p-value*
Proportion of transactions with non-payment	0.08%	0.00%	**-3.1191**	0.0200
Number of observations	336	396		

Note: Test of equality of variance rejected in all cases. All t-tests conducted without assuming equality of variance.

Table 6. Determinants of the Incidence of Theft

The dependent variable is the value of annual losses due to theft divided by total annual sales. Tobit estimates reported.

Exposure factors		*Coef.*	*t-stat.*		*Coef.*	*t-stat.*		*Coef.*	*t-stat.*	
Night storage at sales location	Yes=1				0.465	**4.356**	a	0.297	**2.370**	p
Storage capacity	Log(x+1)				0.020	1.577	a	0.040	**2.204**	p
Trader characteristics										
Total sales	Value	0.029	**2.274**	p	-0.008	-0.539	p	0.008	0.603	p
Years of schooling	Value	0.000	0.108		-0.002	-0.439		-0.005	-1.094	
Years of experience	Log(x+1)	-0.021	-0.887		-0.023	-0.980		-0.038	-1.585	
Location dummies										
In capital city	Yes=1	-0.082	-1.136		-0.079	-1.176		-0.044	-0.614	
In another urban location	Yes=1	-0.031	-0.844		-0.030	-0.829		-0.022	-0.600	
In Vakinankaratra region	Yes=1	-0.091	-1.225		-0.074	-1.073		-0.051	-0.693	
In Fianar/hauts plateaux region	Yes=1	-0.108	-1.473		-0.095	-1.372		-0.081	-1.119	
In Fianar/cotes et falaise region	Yes=1	-0.100	-1.291		-0.068	-0.921		0.016	0.200	
In Majunga/plaines region	Yes=1	-0.102	-1.215		0.242	**2.225**		0.233	**1.738**	
In Majunga/plateaux region	Yes=1	-0.079	-1.031		0.122	1.415		0.169	1.455	
Intercept		-0.463	**-2.912**		-0.508	**-2.709**		-0.541	**-2.995**	
Selection-term		0.181			0.169			0.176		
Number of observations		672			672			672		
% zero observations		92%			92%			92%		
Pseudo R-square		0.0619			0.2901			0.1416		

Notes: a = actual value used as regressor. p = predicted value used as regressor. See text for details.

Table 7. Determinants of the Incidence of Late Delivery by Suppliers
The dependent variable is the proportion of late deliveries in total purchase transactions.
Tobit estimates reported.

Exposure factors		*Coef.*	*t-stat.*		*Coef.*	*t-stat.*		*Coef.*	*t-stat.*	
Respondent places orders	Yes=1				a			1.085	**3.551**	p
Trader characteristics										
Total sales	Value	-0.005	-0.160	p	-0.044	-1.345	p	-0.006	-0.178	p
Years of schooling	Value	0.009	0.868		0.004	0.451		0.002	0.158	
Years of experience	Log(x+1)	-0.036	-0.730		-0.009	-0.199		-0.033	-0.664	
# relatives in agricultural trade	Log(x+1)	0.153	**2.590**		0.002	0.031		0.060	0.976	
# suppliers known personally	Log(x+1)	0.071	1.497		0.019	0.401		-0.008	-0.156	
Location dummies										
Antananarivo	Yes=1	0.024	0.147		0.061	0.435		0.135	0.783	
Other urban location	Yes=1	-0.044	-0.503		0.082	0.937		-0.020	-0.221	
In Vakinankaratra region	Yes=1	-0.137	-0.834		-0.208	-1.498		-0.044	-0.255	
In Fianar/hauts plateaux region	Yes=1	-0.323	**-1.850**		-0.311	**-2.095**		-0.125	-0.665	
In Fianar/cotes et falaise region	Yes=1	-0.298	-1.612		-0.226	-1.381		-0.077	-0.385	
In Majunga/plaines region	Yes=1	-0.330	-1.520		-0.413	**-2.043**		-0.209	-0.940	
In Majunga/plateaux region	Yes=1	-2.364	.		-1.813	.		-2.222	.	
Intercept		-0.503	-1.298		0.604	1.650		-0.621	-1.576	
Selection-term		0.415			0.253			0.408		
Number of observations		669			100			669		
% zero observations		91%			43%			91%		
Pseudo R-square		0.1908			0.350			0.237		

Notes: a = late deveries not observed when no orders are placed. p = predicted value used as regressor.
See text for details.

Table 8. Determinants of the Incidence of Deficient Quality Deliveries by Suppliers
The dependent variable is the proportion of deficient quality deliveries in total purchase transactions. Tobit estimates reported.

Exposure factors		*Coef.*	*t-stat.*		*Coef.*	*t-stat.*		*Coef.*	*t-stat.*	
Verification of quality	Code (c)				0.045	1.207	a	0.024	0.642	p
Trader characteristics										
Total sales	Value	0.007	0.306	p	0.005	0.214	p	0.004	0.159	p
Years of schooling	Value	-0.008	-1.124		-0.008	-1.158		-0.008	-1.170	
Years of experience	Log(x+1)	-0.063	**-1.870**		-0.064	**-1.895**		-0.061	**-1.804**	
# relatives in agricultural trade	Log(x+1)	0.160	**3.988**		0.167	**4.123**		0.178	**3.624**	
# suppliers known personally	Log(x+1)	0.039	1.190		0.044	1.353		0.043	1.303	
Location dummies										
Antananarivo	Yes=1	-0.028	-0.243		-0.033	-0.291		-0.044	-0.373	
Other urban location	Yes=1	-0.020	-0.350		-0.014	-0.247		-0.008	-0.137	
In Vakinankaratra region	Yes=1	0.097	0.842		0.096	0.841		0.080	0.685	
In Fianar/hauts plateaux region	Yes=1	-0.370	**-2.965**		-0.370	**-2.976**		-0.384	**-3.035**	
In Fianar/cotes et falaise region	Yes=1	-0.236	**-1.857**		-0.238	**-1.883**		-0.253	**-1.955**	
In Majunga/plaines region	Yes=1	-0.507	**-3.049**		-0.495	**-2.983**		-0.490	**-2.920**	
In Majunga/plateaux region	Yes=1	-2.163	.		-2.145	.		-2.137	.	
Intercept		-0.157	-0.614		-0.197	-0.769		-0.089	-0.322	
Selection-term		0.354			0.352			0.353		
Number of observations		669			669			669		
% zero observations		79%			79%			79%		
Pseudo R-square		0.327			0.330			0.328		

Notes: a = actual value used as regressor. p = predicted value used as regressor. See text for details.
Code (c) as follows: 1 = always verifies quality; 2 = often; 3 = sometimes; 4 = rarely; 5 = never.

Table 9. Determinants of the Incidence of Late Payment by Clients

The dependent variable is the proportion of late payments in total sales transactions. Tobit estimates reported.

Exposure factors		*Coef.*	*t-stat.*		*Coef.*	*t-stat.*		*Coef.*	*t-stat.*	
Credit sales in total sales	Share				0.433	**7.579**	a	0.189	**2.491**	p
Trader characteristics										
Total sales	Value	0.026	**2.519**	p	0.001	0.060	p	0.018	**1.684**	p
Years of schooling	Value	0.000	0.138		0.001	0.318		-0.000	-0.111	
Years of experience	Log(x+1)	0.024	1.401		0.007	0.431		0.008	0.463	
# relatives in agricultural trade	Log(x+1)	0.028	1.428		0.024	1.244		0.030	1.556	
# clients known personally	Log(x+1)	0.016	1.254		0.014	1.085		0.002	0.161	
Location dummies										
Antananarivo	Yes=1	-0.201	**-3.370**		-0.140	**-2.402**		-0.149	**-2.356**	
Other urban location	Yes=1	-0.057	**-2.135**		-0.031	-1.180		-0.047	**-1.761**	
In Vakinankaratra region	Yes=1	-0.115	**-1.946**		-0.050	-0.869		-0.066	-1.051	
In Fianar/hauts plateaux region	Yes=1	-0.279	**-4.621**		-0.265	**-4.509**		-0.249	**-4.062**	
In Fianar/cotes et falaise region	Yes=1	-0.247	**-3.995**		-0.223	**-3.711**		-0.215	**-3.412**	
In Majunga/plaines region	Yes=1	-0.298	**-4.169**		-0.217	**-3.100**		-0.227	**-2.955**	
In Majunga/plateaux region	Yes=1	-0.332	**-4.842**		-0.246	**-3.658**		-0.255	**-3.407**	
Intercept		-0.263	**-2.126**		-0.087	-0.699		-0.171	-1.330	
Selection-term		0.192			0.184			0.192		
Number of observations		672			672			672		
% zero observations		69%			69%			69%		
Pseudo R-square		0.313			0.485			0.330		

Notes: a = actual value used as regressor. p = predicted value used as regressor. See text for details.

Table 10. Determinants of the Incidence of Non-Payment by Clients
The dependent variable is the proportion of non-payments in total sales transactions. Tobit estimates reported.

		Coef.	*t-stat.*		*Coef.*	*t-stat.*		*Coef.*	*t-stat.*	
Exposure factors										
Credit sales in total sales	Share				0.013	**1.762**	a	-0.003	-0.330	p
Trader characteristics										
Total sales	Value	0.002	**1.910**	p	0.002	1.237	p	0.003	**1.916**	p
Years of schooling	Value	0.001	**1.723**		0.001	**1.817**		0.001	**1.746**	
Years of experience	Log(x+1)	0.000	0.203		0.000	0.059		0.001	0.307	
# relatives in agricultural trade	Log(x+1)	0.005	**2.194**		0.005	**2.146**		0.005	**2.203**	
# clients known personally	Log(x+1)	-0.002	-1.271		-0.002	-1.293		-0.002	-0.963	
Location dummies										
Antananarivo	Yes=1	-0.009	-1.597		-0.007	-1.237		-0.010	-1.593	
Other urban location	Yes=1	-0.003	-0.770		-0.002	-0.555		-0.003	-0.802	
In Vakinankaratra region	Yes=1	-0.015	**-2.431**		-0.013	**-2.067**		-0.016	**-2.368**	
In Fianar/hauts plateaux region	Yes=1	-0.023	**-3.588**		-0.022	**-3.394**		-0.024	**-3.536**	
In Fianar/cotes et falaise region	Yes=1	-0.024	**-3.456**		-0.023	**-3.279**		-0.025	**-3.415**	
In Majunga/plaines region	Yes=1	-0.025	**-2.818**		-0.023	**-2.504**		-0.027	**-2.745**	
In Majunga/plateaux region	Yes=1	-0.026	**-3.151**		-0.024	**-2.798**		-0.027	**-2.996**	
Intercept		-0.038	**-2.506**		-0.034	**-2.162**		-0.040	**-2.469**	
Selection-term		0.015			0.015			0.015		
Number of observations		672			672			672		
% zero observations		93%			93%			93%		
Pseudo R-square		-3.436			-3.631			-3.442		

Notes: a = actual value used as regressor. p = predicted value used as regressor. See text for details.

Table 11. Recourse to Legal Institutions

A. Theft:	
Trader sought help of the police	37.5%
Trader went to court	10.7%
Number of observations:	57
B. Disputes with clients and suppliers:	
Traders who ever used the following in a dispute with client or supplier:	
A third party as mediator or arbitrator	14.0%
The police	4.0%
A lawyer	0.6%
A court	0.7%
Number of observations:	729
Conflict resolution methods used during the last incidence of:	
1. Breach of contract by supplier:	
Trader negotiated directly with supplier	86.0%
Trader sought help of mediator	3.4%
Trader sought help of lawyer	0.0%
Trader threatened to go to the police	0.0%
Trader threatened to go to court	0.6%
Number of observations:	178
2. Breach of contract by client:	
Trader negotiated directly with client	93.6%
Trader sought help of mediator	9.1%
Trader sought help of lawyer	0.5%
Trader threatened to go to the police	3.6%
Trader threatened to go to court	0.9%
Number of observations:	220

Table 12. Determinants of Choice of Dispute Resolution Method

		Dispute with: Supplier		Dispute with: Client			
Dependent variable		*Direct negotiation*		*Direct negotiation*		*Use of Mediator*	
Value		Yes=1		Yes=1		Yes=1	
Characteristics of transaction:		*Coef.*	*z stat*	*Coef.*	*z stat*	*Coef.*	*z stat*
Case of deficient quality	Yes=1	0.196	0.616	n.a.		n.a.	
Length of relationship	Log(x+1)	0.216	**4.418**	0.072	1.185	0.738	**3.273**
Amount paid (supplier)/ due (client)	Log(x+1)	0.055	**1.991**	0.227	**4.974**	-0.094	-0.968
Characteristic of trader							
Total sales	Log(x)	-0.118	-0.961	0.132	1.057	0.231	**1.991**
# relatives in agricultural trade	Log(x+1)	-0.234	-1.058	-0.792	**-3.457**	-0.505	**-1.927**
# suppliers/clients known personally	Log(x+1)	0.332	**1.729**	0.383	**1.846**	0.104	0.531
Intercept		0.918	0.666	-3.163	**-2.147**	-7.512	**-3.849**
Number of observations		180		246		246	
Pseudo R-square		0.229		0.522		0.215	

Table 13. Determinants of Conflict Resolution with Suppliers
Probit estimates reported.

		Dispute is resolved (Yes=1)				Trade is resumed (Yes=1)			
Method of dispute resolution		*Coef.*	*t-stat.*	*Coef.*	*t-stat.*	*Coef.*	*t-stat.*	*Coef.*	*t-stat.*
Direct negotiations with supplier	Yes=1			2.805	**4.585**			0.793	**1.887**
Characteristics of transaction									
Dispute is about quality	Yes=1	-0.711	**-1.912**	-0.538	-1.335	0.191	0.596	0.232	0.706
Days of trade with supplier	Log(x+1)	0.036	0.751	-0.011	-0.185	-0.021	-0.414	-0.053	-0.962
Amount already paid to supplier	Log(x+1)	-0.037	-1.454	-0.040	-1.363	-0.025	-0.933	-0.027	-1.022
Characteristics of trader									
Total annual sales	Value	0.299	**2.177**	0.458	**2.747**	0.259	**1.798**	0.304	**1.982**
# relatives in agricultural trade	Log(x+1)	-0.333	-1.623	-0.326	-1.311	0.054	0.230	0.076	0.328
# suppliers known personally	Log(x+1)	0.364	**1.680**	0.175	0.663	0.129	0.639	0.060	0.286
Intercept		-2.012	-1.278	-5.879	**-2.861**	-1.696	-1.068	-2.645	-1.523
Number of observations		167		167		171		171	
Pseudo R-square		0.177		0.412		0.049		0.081	

Note: Results give the outcome of a contractual dispute conditional on a dispute having occurred.

Table 14. Determinants of Conflict Resolution with Clients
Probit estimates reported.

		Dispute is resolved (Yes=1)				Trade is resumed (Yes=1)			
Method of dispute resolution		*Coef.*	*t-stat.*	*Coef.*	*t-stat.*	*Coef.*	*t-stat.*	*Coef.*	*t-stat.*
Direct negotiations with supplier				2.375	**3.851**			1.680	**3.743**
Recourse to third-party mediator				-1.042	**-2.943**			-0.925	**-2.650**
Recourse to lawyer				-0.536	-0.968			-2.014	**-2.805**
Characteristics of transaction									
Days of trade with client	Log(x+1)	-0.028	-0.586	-0.016	-0.299	-0.064	-1.366	-0.065	-1.227
Value of the sales transaction	Log(x+1)	0.048	0.783	0.052	0.758	-0.056	-1.381	-0.136	**-2.864**
Characteristics of trader									
Total annual sales	Value	0.040	0.457	0.031	0.313	0.033	0.413	0.079	0.913
# relatives in agricultural trade	Log(x+1)	-0.614	**-3.555**	-0.571	**-2.696**	-0.481	**-2.937**	-0.501	**-2.604**
# clients known personally	Log(x+1)	0.603	**3.697**	0.713	**3.781**	0.397	**2.617**	0.491	**2.810**
Intercept		-0.975	-0.923	-3.288	**-2.589**	0.746	0.792	-0.402	-0.393
Number of observations		223		222		235		231	
Pseudo R-square		0.122		0.286		0.077		0.244	

Note: Results give the outcome of a contractual dispute conditional on a dispute having occurred.

Table 15. Trade Credit

A. Procedure to obtain/grant supplier credit	*With Suppliers*	*With Clients*
Purchase several times	83.0%	72.4%
in which case, how many times	7	9
Be referred by another trader	11.3%	17.1%
Provide a bank guarantee or give a deposit	1.5%	2.4%
Fill in forms	0.5%	1.8%
B. Action taken in case of non payment	*Supplier*	*Client*
Stop deliveries	77.7%	88.9%
Go to the police	1.6%	4.4%
Go to court	0.5%	1.8%
C. Loss of credit with other suppliers	*Supplier*	*Client*
Very unlikely	11.3%	20.9%
Unlikely	40.2%	58.7%
Likely	31.4%	15.4%
Very likely	17.0%	4.9%
Number of observations	195	342

Note: Data collected only from respondents who receive or give supplier cred

Table 16. Screening of Potential Trade Credit Recipients

A. Source of information on client	
Obtain information from client himself/herself	95.9%
Obtain information from other traders	24.0%
Obtain information from other sources	12.3%
Obtain information from client's bank	1.2%
B. Information sharing with other traders about bad clients	
Once a day	1.5%
Once a week	1.7%
Once a month	10.1%
Occasionally	62.6%
Never	24.1%
Number of observations:	344

Note: Data collected only from respondents who give credit to clients.

Appendix A. Instrumenting Regression for Total Sales

		Coef.	t stat.
A. Capital and equipment			
Working capital	Log(x)	0.209	**6.720**
Dummy if subsidiary	Yes=1	1.072	**5.018**
Value of equipment	Log(x+1)	0.042	**1.656**
Storage capacity	Log(x+1)	0.174	**3.932**
Number of vehicles	Log(x+1)	-0.210	-0.955
Utilization of telephone	Yes=1	0.368	**2.613**
B. Labor and management			
Age of trader	Value	0.010	**1.880**
Sexe of trader	Male=1	-0.115	-1.269
Manpower (in months/year)	Log(x)	0.515	**5.394**
% family labor in total labor force	share	-0.255	-1.412
Dummy if full time trader	Yes=1	0.138	0.909
Dummy if trader all year round	Yes=1	0.394	**2.833**
Years of schooling of owner/manager	Level	0.026	1.614
Years of experience in agricultural trade	Log(x+1)	0.020	0.268
Speaks another language	Yes=1	-0.156	-1.373
C. Social capital			
Number of relatives in agric. trade	Log(x+1)	-0.225	**-2.186**
Number of traders known	Log(x+1)	0.137	**1.994**
Number of people who can help	Log(x+1)	0.307	**3.541**
Number of suppliers known personally	Log(x+1)	0.053	0.852
Number of clients known personally	Log(x+1)	0.104	**1.695**
D. Entrepreneur's wealth			
Value of home	Log(x+1)	-0.000	-0.683
E. Entrepreneur's attitude			
Propensity to invest in business	Index	-0.145	**-2.448**
Propensity to save	Index	-0.103	**-2.665**
Propensity to spend on durables	Index	-0.023	-0.593
Individualism	Index	-0.063	-1.048
Altruism	Index	-0.016	-0.305
F. Entrepreneur's family background			
Father has primary education	Yes=1	-0.045	-0.362
Mother has primary education	Yes=1	0.071	0.567
Father has secondary education	Yes=1	0.196	1.314
Mother has secondary education	Yes=1	0.056	0.305
Father's years of trade experience	Log(x+1)	0.110	1.183
Mother's years of trade experience	Log(x+1)	-0.124	-1.272
Father's years of ag. trade exper.	Log(x+1)	-0.050	-0.411
Mother's years of ag. trade exper.	Log(x+1)	0.003	0.024
Number of adult brothers	Log(x+1)	0.006	0.197
Number of adult sisters	Log(x+1)	0.081	**2.608**
F. Shocks			
Aggregate sales shock	Ratio	0.161	**1.985**
G. Location			
In capital city	Yes=1	-0.566	-1.591
In another city	Yes=1	0.272	**2.240**
In Vakinankaratra region	Yes=1	-0.457	-1.384
In Fianar/hauts plateaux region	Yes=1	-1.140	**-3.100**
In Fianar/cotes et falaise region	Yes=1	-1.043	**-2.786**
In Majunga/plaines region	Yes=1	-0.388	-0.979
In Majunga/plateaux region	Yes=1	-0.939	**-2.404**
Intercept		6.552	**10.465**
Number of observations		672	
R-squared		0.620	

Appendix B: Determinants of Exposure to Risk

		Storage capacity		**Overnight storage**		**Placement of orders**		**Quality verification**		**Share of credit purchases**	
Dependent variable:		Log(x+1)		Yes=1		Yes=1		Rank from 1 to 4		Share	
Estimator:		Tobit		Probit		Probit		Ordered probit		2-limit tobit	
A. Wealth		*Coef.*	*t-stat.*	*Coef.*	*t-stat.*	*Coef.*	*t-stat.*	*Coef.*	*t-stat.*	*Coef.*	*t-stat.*
Value of home	Value	0.000	**8.055**	0.000	**2.427**	-0.000	-1.031	-0.000	-0.731	0.000	**2.364**
B. Human capital											
Age of trader	Value	0.033	**5.292**	0.019	1.515	0.017	**2.075**	0.004	0.512	0.001	0.370
Sexe of trader	Male=1	-0.190	**-1.777**	-0.068	-0.328	-0.041	-0.298	0.169	1.218	-0.033	-1.392
Years of schooling	Value	0.038	**2.254**	0.049	1.363	0.027	1.236	0.014	0.538	0.007	**1.672**
Years of trade experience	Log(x+1)	0.043	0.478	0.071	0.384	0.007	0.059	-0.098	-0.726	0.062	**2.940**
C. Social network capital											
# relatives in ag. trade	Log(x+1)	0.038	0.306	0.115	0.419	0.154	1.058	-0.722	**-4.218**	-0.034	-1.267
# traders known	Log(x+1)	-0.069	-0.849	-0.093	-0.546	-0.229	**-2.274**	-0.122	-1.093	0.039	**2.135**
# people who can help	Log(x+1)	0.060	0.576	0.432	**2.127**	-0.011	-0.085	0.254	**1.729**	0.025	1.088
# suppliers known pers.	Log(x+1)	0.180	**2.473**	0.013	0.096	0.329	**3.409**	-0.157	**-1.664**	-0.030	**-1.929**
# clients known pers.	Log(x+1)	0.074	1.019	0.188	1.285	0.030	0.327	0.180	**1.778**	0.082	**4.860**
D. Personal traits											
Propensity to invest in business	Index	0.182	**2.640**	0.206	1.598	-0.076	-0.829	-0.224	**-1.939**	-0.051	**-3.117**
Propensity to save	Index	-0.010	-0.219	-0.127	-1.420	0.056	1.021	-0.204	**-3.261**	-0.053	**-5.383**
Propensity to spend on durables	Index	-0.062	-1.353	-0.038	-0.422	-0.043	-0.783	-0.114	**-1.933**	-0.017	**-1.710**
Individualism	Index	0.050	0.699	-0.150	-1.068	0.118	1.403	-0.169	**-1.648**	0.013	0.841
Altruism	Index	-0.040	-0.646	0.373	**2.743**	-0.261	**-3.288**	0.012	0.144	-0.017	-1.234
E. Family background											
Father has primary education	Yes=1	0.091	0.614	0.155	0.500	0.301	1.571	0.078	0.362	0.020	0.602
Mother has primary education	Yes=1	-0.189	-1.254	-0.590	**-1.849**	-0.326	**-1.726**	0.146	0.707	-0.011	-0.312
Father has high school educ.	Yes=1	0.358	**1.992**	0.046	0.132	0.556	**2.446**	0.000	0.001	-0.010	-0.250
Mother has high school educ.	Yes=1	0.230	1.043	-0.144	-0.344	-0.422	-1.507	0.369	1.256	0.021	0.422
Father's years of trade experience	Log(x+1)	0.002	0.013	0.461	**2.439**	-0.046	-0.356	-0.189	-1.380	-0.007	-0.286
Mother's years of trade experience	Log(x+1)	0.026	0.212	-0.283	**-1.688**	0.164	1.280	0.341	**2.552**	0.015	0.639
Father's years of ag. trade exper.	Log(x+1)	-0.070	-0.467	-0.751	**-3.062**	0.101	0.628	0.184	1.085	0.028	0.954
Mother's years of ag. trade exper.	Log(x+1)	0.114	0.775	0.584	**2.523**	-0.175	-1.117	-0.373	**-2.251**	-0.026	-0.883
Number of adult brothers	Value	-0.076	**-2.125**	0.125	**1.732**	-0.011	-0.232	0.075	1.467	0.017	**2.172**
Number of adult sisters	Value	-0.008	-0.200	-0.087	-1.215	-0.055	-1.187	-0.042	-0.805	0.030	**3.613**
F. Location											
In capital city	Yes=1	0.379	0.914	-4.614	**-5.033**	0.213	0.443	-0.097	-0.152	-0.300	**-3.528**
In another urban location	Yes=1	-0.139	-0.986	0.325	1.022	-0.010	-0.055	-0.357	**-1.943**	-0.036	-1.162
In Vakinankaratra region	Yes=1	0.315	0.804	-4.626	**-4.713**	0.143	0.322	0.265	0.433	-0.313	**-3.916**
In Fianar/hauts plateaux region	Yes=1	0.389	0.913	-5.065	**-5.117**	-0.024	-0.048	0.058	0.088	-0.210	**-2.389**
In Fianar/cotes et falaise region	Yes=1	-0.420	-0.979	-6.029	**-6.079**	-0.174	-0.344	0.198	0.304	-0.227	**-2.574**
In Majunga/plaines region	Yes=1	-1.044	**-2.282**	-9.513	**-8.942**	0.400	0.727	-0.955	-1.249	-0.416	**-4.165**
In Majunga/plateaux region	Yes=1	-0.240	-0.555	-8.976	**-9.031**	-0.113	-0.212	-1.413	**-1.933**	-0.460	**-4.943**
Intercept		-0.420	-0.687	4.546	.	-1.675	**-2.247**	-0.363		0.136	1.037
Second intercept (ordered probit only)								0.849			
Third intercept (ordered probit only)								1.330			
Selection-term (tobit only)		1.289								0.250	
Number of observations		696		704		703		700		704	
Pseudo R-square		0.1224		0.7391		0.1471		0.2419		0.4607	