Social Capital and the Firm:
Evidence from Agricultural Trade

by Bart Minten[*] and Marcel Fafchamps[**]

March 1999

ABSTRACT[1]

Social capital is seldom used as an input in the theoretical modeling of economic production processes. However, the returns to social capital in a real world with transaction costs might be as important as to labor, physical or human capital. Evidence from Madagascar shows that agricultural traders rank the importance of relationships for success in business higher than input prices, output prices, and access to credit or equipment. It is shown that traders use social capital to overcome transaction costs through a reduction in information and search costs and through substitution for poor market institutions. Moreover, the significant effect of experience in business on performance of the traders is for a large part explained by the accumulation of social capital over time. Controlling for labor and physical capital, traders who do not develop the appropriate social capital, do not grow.

[*] Department of Agricultural and Environmental Economics, Katholieke Universiteit Leuven (K.U.Leuven), Kardinaal Mercierlaan 92, 3001 Heverlee (Leuven), Belgium. Tel: 16-32-1615 E-mail: bart.minten@agr.kuleuven.ac.be

[**]Department of Economics, Stanford University; currently at DECRG, MC3-535, the World Bank, 1818 H Street N.W., Washington DC, 20433. Tel: 202-473-9174. E-mail: fafchamp@leland.stanford.edu

[1] We benefited greatly 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.

I. Introduction

Economists typically use physical capital and labor as inputs in the description of production processes as it is believed that firms need those inputs to produce. The same reasoning applies for other inputs as for labor or physical capital. Anybody involved in purchases and sales actvities, knows that contacts and relationships are also essential inputs for the survival of a firm. However, while the importance of this "social" capital has long been recognized in other social sciences (see for example Coleman (1988), Putnam, Leonardi and Nanetti (1993), Helliwell and Putnam (1995), Granovetter (1985, 1995)), this view has only recently received attention in the economics literature (e.g., Narayan and Pritchett (1997), Barr (1998), Fafchamps (1998), Lund and Fafchamps (1997), Grootaerts (1998)).

The definition of social capital in different studies has not been uniform. Some have defined it in terms of trust and norms of civic cooperation (Knack and Keefer (1997), Temple and Johnson (1998)) or in terms of cultural values such as degrees of compassion, altruism, and tolerance (Fukuyama (1995)), while others have emphasized institutions together with the quality and quantity of "associational" life (Narayan and Pritchett (1997), Grootaerts (1998), Putnam, Leonardi and Nanetti (1993), Coleman (1988)). While those definitions have common elements, the exact meaning is imprecise and thus difficult to measure. This might have been one of the reasons why economists have been weary to use the concept.

Social capital in its broadest sense can influence economic exchange in two ways. Trust and emotional attachment to a group, society, or association may improve public sector efficiency or facilitate greater cooperation for services benefiting that group, society or association as shown in the works by Coleman (1988), Putnam, Leonardi and Nanetti (1993), Greif (1993, 1994), Platteau (1994) and Gambetta (1988). At the individual level, benefits can occur directly to the individual through knowing others with whom the individual forms networks of interconnected agents. This might facilitate screening in the labor and credit markets (Montgomery (1991), Cornell and Welch (1996), Lorenz (1998)), reduce the search costs for market opportunities (Kranton (1996)), improve the diffusion of information on innovations (Barr, 1997) as well as on bad payers or cheaters (Kandori (1992), Fafchamps

(1998)), and reduce risk (Fafchamps (1992), Fafchamps and Lund (1998)). Much of the work on individual effects of social capital in the economics literature has been in markets where moral hazard issues are severe such as credit and labor.

In the analysis in this paper, we look at the effect of social capital at the individual level in commodity markets. We measure social capital as the number and type of relationships that are used by agricultural traders for business purposes. Hence, we shy away from norms and from memberships in local groups, associations, and institutions. Most of the recent analysis in agricultural markets focuses on price variability, price transmission and margins while studies on behavior of agricultural traders have received less attention. In the case that those surveys took place, little attention has been given to transaction costs and social interaction (e.g. Badiane et al. (1997), Palaskas and Harriss-White (1994)). Notable exceptions are f.ex. Crow and Murshid (1994), Klitgaard (1995), and Staal, Delgado, and Nicholson (1997). However, none of these studies quantifies the effects of social interactions.

In this paper we use data on agricultural traders originating from a recent survey conducted in Madagascar. As in many other countries, Madagascar went through a liberalization period that changed the whole agricultural marketing system. Agricultural markets were heavily controled during a socialistic period from 1972 until 1983. From 1983 on, agricultural markets were gradually liberalized and massive trader entry ensued (Berg (1989), Barrett (1997a,b)). In the period immediate after the reforms, the government stayed present in agricultural markets through intervention in rice distribution, monopoly setting in major production areas, or price protection (Shuttleworth (1989), Minten (1997)). The situation now is one with minimal state intervention or regulation, little restriction on product movements, and with free price setting by private traders.

This paper contributes to the literature on social capital through the illustration of the economic effect of social capital on the functioning and the performance of firms in commodity markets. The similarity between other types of capital and social capital are indicated. The structure of the paper is as follows. First, a overview of the survey methodology and the structure of agricultural trade in Madagascar is given. Second, the different channels through which social capital is used to overcome transaction

costs in imperfect markets are discussed. Third, the determinants of social capital and the quantitative impact of social capital on performance is analyzed by means of regression analysis. The paper finishes with conclusions and policy implications.

2. Survey Methodology and the Structure of Agricultural Trade in Madagascar

2.1. Methodology

A survey of agricultural traders was conducted in 1997 in Madagascar in a joint project between IFPRI (the International Food Policy Research Institute) and the local Ministry of Scientific Research (FOFIFA). The survey consisted of two rounds. The first round was held between May 1997 and August 1997 (the main trading season) and focused on questions dealing with the individual characteristics of the traders and with the structure, conduct, and performance of the agricultural trading sector. During the second round, from September 1997 and November 1997, questions were asked about the nature of relationships with fellow traders, clients, and suppliers.

The sample design was constructed so as to be as representative as possible of all the traders involved in the whole food marketing chain from producer to consumer, wherever located. Three main agricultural regions were covered (Fianarantsoa, Mahajanga, and Antananarivo) and traders were surveyed in three different types of location:

- Traders operating in big and small urban markets in the main town of every province (*faritany*) and district (*fivondronana*). These traders are mostly wholesalers, semi-wholesalers, and retailers.
- Urban traders located outside the regular markets. These often are bigger traders, processors (e.g., rice millers), and wholesalers.
- Traders operating on rural markets at the level of the rural county (*firaisana*). These are mostly big and small assemblers and itinerant traders. Rural firaisanas were selected through stratified sampling based on agro-ecological characteristics to represent the various kind of marketed products and marketing seasons.

The survey focused on traders that marketed locally consumed staples such as rice, cassava, potatoes, beans, and peanuts. The different forms in which these products are

marketed were taken into consideration, i.e., paddy and milled rice, maize and maize flour, etc. Traders involved primarily in export crops, fruits, vegetables, and minor crops were excluded. Most surveyed traders (67%) report rice as the agricultural product they trade most intensively. This reflects the importance of rice as the main staple food in the country[2]. Other most actively traded products are beans and lentils (18%), cassava (5%), potatoes (5%), peanuts (4%), and maize (2%).

A total number of 850 traders were surveyed in the first round, 729 of whom were surveyed again in the second round. The analyis presented here is based on traders that could be located in the two rounds[3]. The main characteristics of the respondents are summarized in Table 1. The three provinces of Antananarivo, Fianarantsoa, and Majunga are represented more or less equally in the sample. A breakdown of the sample by size and occupational category is given. Retailers constitute the bulk of the sample. They are divided into retailers with a semi-permanent selling point – usually a table or stall in the market itself; and retailers without fixed selling points, that is, those who sell immediately from the roadside. The latter are typically smaller and less formal. In contrast, the largest traders are assemblers (traders who collect large quantities from the countryside and assemble them for shipment) and wholesalers (traders who operate in bulk).

2.2. Structure of agricultural trade in Madagascar

Generally, Malagasy traders are of average age – about 37 years of age – mostly male, and married with three children (Table 1). A large part of the retailers without fixed selling points are either bachelors, widow(er)s, or divorced. The retailer category thus seems more heterogeneous, i.e. made of individuals in the beginning of their career and of people that might have entered the sector because of personal problems such as

[2] It is estimated at the national level that rice makes up half of the calorie intake of the population in rural areas (Secaline, 1996). However, the percentage is significantly higher in the regions in the survey as the province of Tulear characterized by a significantly drier climate and therefore different agricultural production and consumption habits than the rest of the country was not included in the sample.

[3] The category of traders which were hardest to trace during the second survey round are those who are least formal and have the least permanent form of operation. As a result, itinerant traders tend to be underrepresented in the results reported here. The reader should also bear in mind that the Indo-Pakistani traders, who constitute a small minority in the total number of traders – but more important in bigger size categories –, tended to refuse participation in the survey.

divorce or death in the family. Retailers without fixed selling points are mostly women while men are more numerous in the assembly/wholesale category. Many traders have received primary or some secondary schooling while 40 percent has pursued higher education. Trading is generally done on a full time basis and is conducted year round, as reported by 78% of the respondents. The traders that work part time are open for business during some months of the year, buying and selling heavily during the after-harvest months of April and May[4].

The trading in agricultural crops is often the main activity and most traders deal in different crops. However, rice accounts for the largest portion of total sales amounting to 43 percent of total revenue. Surveyed traders have on average spent 6 years trading agricultural products. 68% of the traders started their business in the 90s, significantly later than the onset of agricultural trade liberalization. However, new entry seems to have come to a halt and seems to be on the decline in recent years (Mendoza and Randrianarisoa, 1998). This seems to be driven by changes in the overall economic situation and not in the entry requirements as market licenses are easy to obtain and do not cost very much, according to the majority of the traders interviewed. This is comforted by the fact that 65% of the traders say that competition among traders has intensified over the last two years and that more traders experienced decreasing rather than increasing profits.

Malagasy traders employ very few people other than themselves. Permanent and temporary workers account for nearly half the total number of man months used by the trader while the other half is family and own labor. The labor use differs by category. 65 % of total labor used by wholesalers and assemblers is hired and outside labor while retailers rely heavily on own and family labor. In this case, outside labor makes up only between 5 and 20%. Marketing is highly localized, interregional trade is small and market coverage is limited in Madagascar. Almost 60% of the traders buy their products within a radius of 25km. This is understandable for the retailers who buy mostly from traders who bring the products to retail markets. However, even wholesalers and assemblers do not travel very far. Only 15% of the assemblers and

[4] There is significant seasonal variation in agricultural markets. Rural rice prices typically rise 100 to 200% in the lean period compared to after harvest. There is reversal of flows between rural and urban

9% of the wholesalers purchase rice from an area further than 100 km. This low regional product specialization – and lack of market integration (Badiane et al., 1998) - seems partly due to the high transportation costs and less to lack of transport available as most traders report to have access to some means of transportation.

The surveyed businesses are fairly small and unsophisticated. Average working capital is around $2,000 – a large number compared to the annual GDP of Madagascar which was 230 US dollars in 1997 but very small compared to the turnover of grain trading companies in the US or Europe. Few of the traders possess their own means of transport and investment in equipment is low compared to working capital. Most of the working capital seems to be tied up in the product itself. The size distribution among traders is quite significant. Assemblers make the highest gross margin per month, i.e. over $1800, compared to only $75 for the retailers without selling points. Moreover, Fafchamps and Minten (1998a) show that traders in the upper tercile of the firm size distribution use 15 times more working capital and two times more labor but they obtain almost fifty times more gross margin than traders in the lower tercile. Hence, large traders have a much higher total factor productivity than the small ones. In the remainder of the paper, we examine possible explanations for these differences and investigate particularly the role of social capital. In the next section, we do this through a descriptive analysis of the way traders do business in Madagascar.

3. Imperfect markets and social capital

Table 2 illustrates the importance of different factors for success in business as evaluated by the traders themselves. Relationships are by far the most important factor for succes as 71% of the traders regard reputation and relationships as “very important”. This percentage is much higher than for the other reasons that were suggested: access to credit, granting credit, the level of purchase or sales price, and access to transport equipment. While a surprising result at first, these relationships can have multiple advantages for the trader. The analysis will illustrate that traders use these relationships to deal with the significant transaction costs that they face. It will

areas between harvest and lean period and some traders change occupational category during the year, e.g. they may be assembler during the harvest period and semi-wholesaler during the rest of the year.

be argued that traders use relationships and social capital to overcome three obstacles in imperfect markets fairly that are typical for commodity markets in developing countries: (1) poor market institutions, (2) high search costs, and (3) imperfect and asymmetric information.

3.1. Poor market institutions

(a) Credit

The use of trade credit by traders is extremely limited. 89% of the traders report that they use only their own funds to support their business operation (Table 3). A mere 4% of the traders has ever asked for credit from a formal institution (Fafchamps and Minten, 1998a). The major reasons given for non-application are ignorance, high interest rates, complicated application procedures, and lack of collateral. In the case that there is some element of credit, the funds come from the informal market. However, informal credit does not substitute for lack of formal credit: only one trader out of ten derives part of its working capital from informal credit sources.

The minor importance of formal institutions in traders' operations is further illustrated by the fact that only 15% of the surveyed traders has a bank account, 10% a savings account, and 1% a bank line of credit. Hence, it is not surprising that traders use no checks (less than 0.5% of the traders). Most of the agricultural trade – sales as well as purchases - takes place without orders (only 2% of the purchases) and without credit and are cash-and-carry transactions. Therefore, search and supervision costs are higher than they should be and massive amounts of currency constantly circulate in the countryside – an invitation to theft[5] and a perfect target for an inflation tax.

(b) Contract enforcement

As for credit, the use of formal institutions is also extremely rare for contract enforcement. Only 5% of the traders ever used police, laywers or courts since the start

[5] Rural insecurity and cattle theft has traditionally been a big problem and some areas in Madagascar resemble the times of the Wild West in the U.S.. Rural insecurity increased apparently significantly in the lawless period after the impeachment of President Ratsiraka in 1991. In 1997, an average rural village reported 2 thefts of cattle, 30 thefts of small animals, and 12 thefts of agricultural products (Minten, Randrianarisoa, and Zeller, 1998).

of their business (Table 5). The dominant response to conflict resolution is negotiation with the other party or sometimes use of a third party as mediator. However, not using legal institutions does not imply that contracts are not enforced. Most of the disputes are resolved and trade continues. Contractual disputes are resolved through negotiation seemingly because the traders want to continue the relationship. A relationship is valuable as a majority of traders report that it would be fairly or very difficult to find a new supplier if they lost one. Hence, conflicts have to be solved and it is shown that conflicts are more often resolved when suppliers (clients) have a longer term relationships (see Fafchamps and Minten, 1999).

(c) Insurance

Commodity trade is characterized by high variability and is subject to all kinds of risks. Co-variate risks such as bad road infrastructure, high level of insecurity, climatic calamnities, and high price fluctuations and idiosyncratic risks such as non and late payment and the non-detection of bad quality hinder agricultural trade and might all be the cause of financial stress for small trading companies. A system of risk and insurance sharing might mitigate the consequences of adverse outcomes or might even allow traders to pursue higher return but more risky activities. In the absence of formal institutions, social capital might play this role.

The overwhelmingly majority of the traders are involved in some kind of informal insurance mechanism. 77% of the traders report to have helped others while 75% has ever been helped by others (Table 4). Moreover, larger traders are more involved in solidarity networks than their smaller competitors[6]. While large traders do not believe that they have more friends, they actually do. They know more people that can help them than smaller traders. They also perceive relationships differently. Large traders believe that they will be helped more by family and by others when they need it and they are more likely to help others if needed. Larger traders also perceive family and friends less as a burden than smaller traders. Not surprisingly, smaller traders are more proud of their own achievements without help. Consequently, they are more dependent of the success of their business for their own survival as they seem to have

[6] Traders were divided in tercils, based on the size of total sales over the last year.

less social fallback. These beliefs indicate how large traders are better able to use social capital to the advantage of their business. This finding is in contrast with other studies where relationships are seen as a burden on growth and lead to lower efforts (Platteau, 1994). Under these assumptions only business men and women with more individualistic behavior fare better. Our data show that this is not the case in Madagascar.

Social capital matters when market institutions fail. Social capital can be a source of trade credit in an environment where formal credit is rare, it can be used for insurance through risk sharing, and it can be a substitute for contract enforcement in an environment where formal institutions are not effective. The results presented here resemble those studied and observed in similar situations, i.e. a mild impact of breach of contracts (e.g., Fafchamps (1998), Greif (1993, 1994), Kandori (1992)) and a low reliance on legal instutions (Fafchamps (1996), Bigsten et al. (1998)).

3.2. High search costs

(a) Supply

Finding suppliers and choosing between suppliers are used as a measure of search costs. 44% of the traders report that they have occasionally problems finding suppliers (Table 6). This is line with the fact that 55% of the traders have little choice between suppliers. Hence, there is an incentive for traders to assure regularity in supply. The traders that have the highest number of regular suppliers are also the ones that have least problems to assure a regular supply (Fafchamps and Minten, 1998a). Overall, almost 60% of the traders report that they buy from regular suppliers, accounting for almost 40% of their purchases. The importance of regular suppliers increases significantly with the size of the firm: 37% of the small traders buy from regular suppliers while 71% of the big traders do. The relationship between traders and regular suppliers is in the majority of the cases exclusively based on commercial grounds.

Regular relationships with suppliers also allow the trader to engage in forward ordering. It is more commonplace among larger traders do so: almost 19% of large

traders place orders compared to only 7% of small traders. Apart from regularity in supply, relationships between suppliers and traders also help to avoid losses due to bad quality products. Large traders are better able to get replacement for their products or to get refunds when a problem occurs while small traders have to deal relatively more with the quality problem on their own. The quality uncertainty might be one of the major reasons why 20% of the traders even refuse to buy from unknown suppliers.

(b) Demand

Finding clients seems less difficult than finding suppliers. However, the same trends in the relationship between trader-supplier and trader-client are noticed. Only 16% of the traders often do not find clients while almost 60% of the traders report to always have the choice between clients – significantly higher than the percentages on the supplier side (Table 7). Hence, the incentive to develop regularity with clients is significantly lower than for purchases. There are lots more contacts with clients than with suppliers. The small traders serve 57 clients with the quantity purchased from one supplier compared to only 25 in the case of large traders. Hence, small traders have many more contacts with clients and make them therefore less regular. Larger traders apparently face more problems of finding clients and therefore, the pay-off for the development of regular relationships is much higher. Overall, 54% of the traders sell to regular clients, representing 27% of the value of sales. However, almost three quarter of the bigger traders sell to regular clients while only one third of the smaller traders do so. The regularity leads possibly to more chance for refunds if quality turns out to be a problem. In the case that smaller traders have regular clients, this relation is more often based on family, religious, or ethnic relationships than in the case of bigger traders. Few of the traders see problems selling to an unknown client.

(c) Marketing services

A third dimension for search costs is the search for marketing services such as storage and transport. Mendoza and Randrinarisoa (1998) show that both these costs - together with wages of employees and the financial costs on the capital used - make up most of the operating costs of the trader. 82 % of the traders have access to

storage. However, only 12% rents storage space. Search costs are the main reason for storage as the majority of the traders declare to store as they wait for clients (reported by 74% of the traders). Storage for better prices is the major reason only for 12% of the traders. This latter percentage is significantly higher for the assemblers and wholesalers. Because they are on average wealthier, they might be better able to bear risk, to keep capital tied up in storage, and to reap the benefits of long-term storage (Barrett, 1997a).

78 % of the traders use transportation services. While the majority of traders reports that the supply of transport services is no problem and they do not often face problems to find transporters (71% of the traders who use transportation services say they have the choice), they still tend to develop a regularity in the trips that they undertake and in the relationships with those transporters: 52% of the traders travel often or always with the same transporter. The relationship with the transporter is mostly exclusively based on commercial grounds. As in the case of supply and demand, regularity in relationships might lead to more sophisticated transactions[7].

An important percentage of the traders indicate that they face occasional problems finding a potential buyer or seller and that they store mainly to find clients. Given that most of the agricultural goods are perishable and that storage conditions are often bad, this could be disastrous for some of the traders. The establishment of a relation where suppliers have regular clients and vice-versa might be to their mutual financial benefit. These findings are all consistent with theoretical models on cooperation among individuals in an environment with high search costs (Ghosh and Ray (1996), Fafchamps (1998)).

3.3. Imperfect and asymmetric information

Traders face imperfect and asymmetric information on the market situation, on suppliers and clients, and on products. In the absence of public information services, the development of social capital might produce the necessary insights in the situation

[7] It should be mentioned that most traders find that transportation costs are too high and that the government should get more involved to reduce those costs.

of demand and supply. Given weak market institutions, traders might become more efficient through the development of a credible supplier and client network that allows more sophisticated ways of trade: granting and receiving credit, forward ordering, and less quality checking.

(a) Market situation

Malagasy traders have imperfect access to modern means of communication as the great majority of the traders do not have a phone or fax for their business (Table 9). Although that the majority of traders report they would be able to have access to a phone, few actually use it. Information on the market situation is obtained through personal contacts with other traders, suppliers, clients, or through messengers while the role of public sources such as newspapers, radio, and public services is extremely marginal. The various types of information are obtained from different sources. 66 percent of the traders obtains information about price changes from fellow traders while only 19 and 16 percent do this for market demand and supply respectively. In the last case, information is gotten from suppliers and customers directly. Retailers rely relatively more on information from fellow traders than assemblers or wholesalers.

(b) Credibility of suppliers and clients

If traders want to engage in more sophisticated ways of trading – forward ordering, granting and receiving credit, no checking of quality for every transaction – they need to establish a system of information on the credibility of clients and suppliers to better enable contract enforcement. Table 10 illustrates the manner in which traders evaluate credibility. Overall, there is a great similarity in the way suppliers treat surveyed traders and traders treat their own clients. More sophistication in transactions is achieved through the development of long-term relationships. Forms, recommendations by other traders or bank garanties are seldom used as ways to verify credibility. Most traders report that they will never grant/receive credit or order forward when they deal with a trading partner for the first time. They will only start doing so after a minimal number of transactions (between 9 and 13 transactions on average). There seems to be little reward for immediate payment of a transaction as

prices are on average only reduced by 1.5%. However, given that the delay for the payment is only between six and thirteen days, this still constitutes an extremely high yearly interest rate (compounded between 150% and 250%).

However, more sophisticated transactions lead to a higher incidence of problems (Fafchamps and Minten, 1999). A significant number of traders are regularly not able to settle their accounts in the time required. If they are not able to do so, they will mostly not obtain new supplies[8]. A threat of using the police or court to settle the problem is almost unheard of, let alone that one actually uses these institutions. The non-payment of one supplier does not seem to have an impact on credit or forward ordering by other ones. On the other hand, the majority of the traders believe that it is rather or very hard to find suppliers that are willing to extend credit. So, it seems that once the trader is on good terms with one particular supplier, he has an incentive to want to preserve that good relationship. It seem easier to find a new client to whom to grant credit. This might be due to the higher number of clients the trader interacts with compared to suppliers[9].

(c) *Products*

Most traders possess and use balances to check quantities during transactions (Mendoza and Randrianarisoa, 1998) which implies that quality is the big unknown in the transactions of products. Quality of products shows significant variation in Madagascar between regions as well as within regions: only 6% and 7% of the traders report that quality never varies between regions and within regions respectively (Table 11). The Green Revolution did not happen in Madagascar due to a variety of reasons (Badiane et al., 1998). Therefore, a multitude of local non-improved varieties with inherently different quality characteristics are found in local markets. Hence, verification of the quality of the product is important and necessary: 85% of traders and clients report that they *always* inspect the quality of the product before the purchase. Moreover, prices depend on it – only 7% declares that prices of products do not vary with quality.

[8] Similar findings are reported by Fafchamps (1996) in Ghana.
[9] Greater choice between clients per se is illustrated by the fact that 68% and 18% of the traders face an "infinite" number of clients and suppliers respectively.

It can be assumed that given the multi-layered nature of agricultural trade and the large number of transactions, the checking of quality is an important cost in the spread between producer and consumer prices. Moreover, quality inspection is hardly delegated (93% of the traders report to check the quality themselves). This suggests that quality checking is perceived to be critical for firm performance. As traders want to assure quality, they often have to do numerous trips to supply areas, some of which are for nothing since traders do not use telephones, can not or will not place or take orders, and must search for buyers and sellers once they are on location. In such an environment the development of reliable social capital must singularly reduce the costs of doing business. If a trader is not able to develop this social capital, his firm might show limits to growth. This is discussed in the next section.

4. Determinants of and returns to social capital

4.1 Methodology

Regression analysis is used to determine the quantitative impact of the different social capital variables and of the channels through which the social capital has an impact on performance. First, the different measures of social capital that are used in the analysis are discussed and their determinants are analyzed. Second, returns to social capital are estimated. The following production function is used:

$$Q=f(L,K,H,S)$$

where Q stands for output, L for labor, and K, H, and S for physical, human, and social capital respectively. If S would have no effect no performance, its inclusion in the production function would lead to insignificant regression coefficients. Moreover, the accumulation process of inputs and firm performance is further unraveled. The channels through which experience in business influences performance is tested through different specifications with and without the social capital and with and without the physical capital and labor variables included.

Potential difficulties with the specification as such might arise. First, there might be simultaneous determination of dependent and some of the independent variables. Hence, instrumental variables were constructed based on an extensive dataset of

exogenous variables (for details see Fafchamps and Minten, 1998b)[10]. Second, a measure of location specific sales shocks is included to minimize the bias resulting from such shocks. Third, it could be argued that social capital is just a by-product of economic success. While it is shown in the previous section how social capital can be effective in increasing productivity, a second specification is run to test through which channels the effects of social capital might work:

$$Q=f(L,K,H,S; C)$$

where C stands for different channels (reduction imperfect information and search costs; substitution market institutions). If S affects Q only because it reduces C, including C in the regression should result in a non-significant coefficient for S. If, however, S has an effect on output beyond its effect on C, then both C and S should be significant in the equation[11].

Labor and physical capital are measured through obvious variables. Human capital variables, entrepreneur characteristics, and family background are included as they potentially raise the efficiency of labor and capital. Non-essential inputs such as storage capacity are added as log(storage+1). This avoids losing observations when the repondent has no storage capacity while being consistent with the use of logged gross margin as dependent variables. The five measures for social capital are entered in log form to account for the possibility that marginal returns to social capital are decreasing. The same is done for experience in trade. Two measures of shocks are included: whether the firm has been victim of a theft in the preceding year; and a measure of aggregate sales shock computed as the growth in total annual sales enjoyed by traders in the same location. Location dummies are added to control for differences in competition and business environment across space.

We expect factors of production such as equipment, working capital, telephone use, and labor to have a postive and significant effect on output. We also anticipate that measures of human capital such as experience, schooling, and number of languages spoken should have a beneficial effect on productivity, together with social network

[10] Instruments include family background variables, business start-up experience, personal wealth and financial assets, and access to telecommunication equipment.

[11] Other potential problems with the specification are discussed extensively and dealt with through robustness testing in Fafchamps and Minten (1998).

capital and aggregate shocks. Before we turn to these results, we first look at the question how social capital is established.

4.2. Establishment of social capital

It is assumed that just like entrepreneurs need to accumulate machinery and equipment to be successful, most of the social capital has to be accumulated and busy entrepreneurs have to use valuable resources, e.g. time, to invest in it. The five measures of social capital that are used in the analysis are the number of relatives in agricultural trade, the number of traders known, the number of people who can help financially, and the number of suppliers and clients known personally.

The regression results clearly illustrate the accumulation process of economic inputs (Table 12). For all variables – except for relatives in trade – social capital increases with the number of years in trade. The elasticities range between 8% for the number of people who can help and 33% for the number of traders known. This seems intuitive as it takes more time and effort to develop a relationship with somebody who is willing to help in time of financial trouble than to develop a different type of relationship where one knows traders, suppliers, and clients personally. Although it might be the case that successful traders employ more family employees over time and thus raise the number of relatives in agricultural trade, this seems not to be a major determinant for that measure of social capital as the coefficient on experience is small and insignificant. One seems mostly born with this type of social capital.

The same type of regression was run on other inputs used in a typical production function, i.e. labor and physical capital. These input variables exhibit the same type of behavior with respect to experience in business. Labor and physical capital show a positive elasticity of 0.12 and 0.57 respectively. The elasticity on the value of equipment is very high. Given that physical capital is mostly a long term investment, access to credit is often necessary to be able to finance this. Hence, as social capital might improve this access as shown above, it might also have an additional indirect influence through this channel on performance.

Other variables show little influence on the development of social capital. The level of education shows a positive sign in all the regressions but the coefficient is only significant in one case. The gender for the trader shows a negative sign in all regressions – and is significant in one. Women might be less successful in the development of social capital as they have to spend more of their extra time that could be used for the build-up of social capital on household chores and child rearing. The age of the trader shows also an expected positive sign for the different measures of social capital as well as a decreasing marginal effects as the quadratic term is always negative. Their coefficients are significant in two out of five cases.

4.3. Social capital and experience in business

Three sets of explanatory variables are used to explain performance of the trader - measured by total sales and total value added over the last year: (1) human capital only; (2) controlling for physical capital and labor; and (3) controlling for social capital[12]. The results are presented in Table 13. Experience turns out to be highly significant in the specification where social capital, human capital and labor are left out. In this case does a doubling of the years of the experience in trade increase sales by 50% and value added by 60%. Evaluated at the mean and controlling for other inputs, one year longer in business increases sales and value around 10%[13]. In the specification where one controls for physical capital and labor, the size – as well as the significance - of the experience coefficient drops significantly to 19% and 25% respectively in the total sales and value added regression. Finally, after additionally controlling for social capital, the significance of the effect of experience in trade disappears both for the value added as for the total sales regression while the size of the elasticity drops by another 10%. Hence, we conclude that a large part of the effect of business experience on performance seems to come from the accumulation of social capital over time and less from the development of other types of know-how. Other things equal, if the trader is not able to develop the necessary social capital, his firm will not grow over time.

[12] The purpose of the different specifications is to illustrate the effect of business experience. As relatives in agricultural trade are not accumulated over time as shown in Table 12, this form of social capital is included in all specifications.

[13] As we have no panel data on traders, this does not reflect growth in the agricultural marketing sector. Only the successful traders stay in trade while others might move on to other activities.

Working capital and labor have the expected sign and are highly significant. Traders with a subsidiary are shown to more than double the value added. Equipment, storage capacity, and telephone use have mostly the expected sign but none of them are significant. In contrast, ownership of transport vehicles appears to have a negative effect on value added, possibly because respondents are engaged in transport as well as trade[14]. Being a part-time trader does not appear to have a noticeable effect on value added but year-round traders tend to create more of it. On the human capital side, schooling of the owner is shown to raise value added but its coefficient is not significant. A surprising result is also that traders who commonly speak a language other than Malagasy do less well than those who do not know another language. One explanation might be that these traders divert their attention away from domestic agricultural trading activities to import-export activities, which are not captured in the survey and in the measure of performance.

Most measures of social capital are shown to raise gross margins significantly even afer controlling for working capital and equipment, labor, human capital, and management skills. A joint test for the significance of the coefficients on non-family social capital is significant in both specifications. The two most important dimensions of social capital appear to be the number of traders known and the number of people the trader can count on in times of trouble. The estimated coefficients indicate that a doubling of the number of known traders raises the value added and total sales by 27% and 19% respectively while the number of people who can help in times of trouble raises it by 18% and 29% respectively.

The number of close relatives in trade appears with the wrong sign and is highly significant in all specifications. Some insights on an explanation are given by the fact that coefficient is no longer significant when the subsidiary dummy is omitted from the regression and it gets smaller in absolute value when one controls for close interaction with businesses held by relatives. This is consistent with the ideas that traders who have close relatives in trade have trouble mentally disentangling their business from that of their relatives and, as a result, tend to overreport the working

[14] No data are available on the benefits from transport and hence, are not included in the dependent variable.

capital and the equipment that is truly theirs. Another possibility is that unclear business boundaries dilute incentives and result in lower unobserved efforts[15]. In any case, it is clear from these results that family relationships do not constitute the only, or even the major component of social capital, contrary to what is often assumed (e.g. Granovetter (1995)). If anything, non-family networks are more important than family networks in business. This finding is consistent with Bigsten et al. (1998) and Minten and Kyle (1999) who report that family links account for only a minute portion of relationships in African manufacturing or in agricultural trade in the Congo respectively.

4.4. Social capital and modes of transactions

In the descriptive sections, we have argued that social capital affects the firms' performance through a reduction of transactions costs or as a substitute for poor market institutions. We now investigate quantitatively the effect of the different modes of transaction on differences in efficiency between traders. Two sets of regressions are presented (Table 14). The first regression presents the straight OLS estimates. A second regression corrects for possible simultaneity bias in working capital, labor, and modes of transactions. Multicollinearity is likely to occur as we do not have good instruments for the propensity of traders to rely on each particular mode of transaction separately from the others[16].

First, we discuss transactions costs due to imperfect information. The sources of price information seem to be crucial. Estimated OLS coefficients indicate that those traders able to rely on their clients and suppliers or on messengers to gather reliable information about prices perform significantly better than those who must rely on the information provided by other traders like them. In both cases, the effect is large: reporting clients and suppliers as the main source of price information is associated with a 60% increase in gross margin while the use of messengers lead to an increase of more than 100%. Not having to inspect the quality of supplies at each purchase is

[15] Moreover, Fafchamps and Minten (1999) show also that more relatives in agricultural trade lead to more unresolved conflicts between trader and supplier and trader and client.

[16] Although we still have a large number of exogenous variables compared with any conventional standard.

similarly associated with higher margins. Quality checks by the client might lead to less rent for the trader himself as shown by the negative but not significant sign.

A reduction of search costs measured through having regular clients is associated with higher sales and margins. However, contrary to expectations, we find that firms that place orders with suppliers get significantly lower margins, in the OLS as well as the IV specification. One possible interpretation is that Malagasy traders only place orders when they cannot find ready supplies. This interpretation is consistent with the fact that orders are often fulfilled late (Fafchamps and Minten, 1999). In this context, placing orders is a sign of weakness and is associated with smaller margins. Trader's ability to sell on credit is also shown to be an important determinant of performance. Since granting credit is a highly risky proposition, firms better able to identify reliable clients appear to be at an advantage, even after controlling for working capital, labor, education and the like. Both coefficients are significant and have a high value in the OLS regression but the significance disappears when corrected for endogeneity.

The results provide important insights as to the particular role of the different dimensions of social capital: once we control for modes of transactions in imperfect markets, only those dimensions that raise efficiency in ways other than by facilitating transactions should remain significant. These effects can be seen through the comparison of the coefficents on the social capital variables in Table 13. The coefficient on the number of traders known drops in size. Having relationships with more traders facilitates transactions in ways that are largely captured by the mode of transaction variables. On the other hand, the number of people that can help in a financial emergency stays constant and increases even in size. This indicates that better insurance raises efficiency in ways other than through the reduction of transactions costs. The reason is likely to be that traders able to deal with liquidity risk can take better advantage of arbitrage opportunities without fear of becoming illiquid. The number of close relatives continues to have a negative and signficant coefficient and its size decreases only slightly. Hence, relatives in trade seem to have little to do with transactions costs and the explanation of its effect might be linked to the fact that they overstate their own resources due to inadequate distinction fom those of their relatives.

5. Conclusions

In this paper we look at the effect of social capital - measured through the number and the type of relationship - on the individual performance of the firm. To this effect, we use an extensive dataset on agricultural traders in Madagascar. It is shown that social capital influences economic performance through: (1) a reduction in search costs for products, suppliers, and clients; (2) a substitution for poor market institutions for credit, insurance, and contract enforcement; and (3) a reduction of imperfect information on the market situation, on suppliers and clients, and on the quality of the product.

Social capital shows same characteristics as other kinds of capital that are typically put into economic production functions such as physical capital and labor: it is similarly accumulated over time and it significantly improves economic performance. Moreover, controling for physical capital and labor, business experience outside the development of social capital is shown to have no significant effect on performance. Hence, in the case of traders in Madagascar, the effect of "learning by doing" over time is almost completely explained through a "learning by knowing". The major difference between other production inputs and social capital seems to be a well identified opportunity cost. While the cost of overaccumulation of labor and physical capital would show up in lower profits for the firm, this might not be the case for social capital.

The research presented has important policy implications. Raising social capital and reducing transaction costs can be sought by encouraging interaction between traders (e.g. Chamber of Commerce), by refraining from victimizing business communities irrespective of their ethnic origin, and by facilitating better information. The development of legislation and reliable courts is often not sufficient for efficient markets to arise. This is because the threat of court action to punish breach of contract is seldom credible for small transactions and because relationships are too valuable to risk losing. While the results of this study demonstrate the significant effect of social capital on firms in the service sector, it would be useful to extend the study as the quantitative importance of social capital remains to be tested in other sectors of an economy.

References

Badiane, O., Goletti, F., Kherallah, M., Berry, P., Govindan, K., Gruhn, P., and Mendoza, M., Agricultural input and output: marketing reform in African Countries, report submitted to the Bundesministerium fur Wirtschaftliche Zusammenarbeit (BMZ), IFPRI, Washington DC, 1997

Badiane, O., Goletti, F., Lapenu, C., Mendoza, M., Minten, B., Ralison, E., Randrianiroa, C., Rich, K., Zeller, M., Main results and policy implications of the IFPRI-FOFIFA research project on Structure and conduct of major agricultural input and output markets and response to reforms by rural households in Madagascar, IFPRI, Washington DC, 1998

Barr, A.M., Social Capital and Technical Information Flows in the Ghanaian Manufacturing Sector, Center for the Study of African Economies, Oxford University, Oxford, July 1998. (mimeograph)

Barrett, C.B, "Food Marketing Liberalization and Trader Entry: Evidence from Madagascar," World Development, 25(5): 763-777, 1997a

Barrett, C.B., "Liberalization and Food Price Distributions: ARCH-M Evidence from Madagascar," Food Policy, 22(2): 155-173, 1997b

Berg, E., "The Liberalization of Rice Marketing in Madagascar," World Development, 17 (5): 719-728, 1989

Bigsten, A., Collier, P., Dercon, S., Fafchamps, M., Gauthier, B., Gunning, J.W., Isaksson, A., Oduro, A., Oostendorp, R., Patillo, C., Soderbom, M., Teal, F., and Zeufack, A., Contract Flexibility and Contract Resolution: Evidence from African Manufacturing, Department of Economics, Stanford University, Stanford, March 1998. (mimeograph)

Coleman, J.S., "Social Capital in the Creation of Human Capital," American Journal of Sociology, 94 (supplement): S95-S120, 1988

Cornell, B. and Welch, I., "Culture, Information and Screening Discrimination," Journal of Political Economy, 104(3): 542-571, 1988

Crow, B. and Murshid, K.A.S, "Economic Returns to Social Power: Merchants' Finance and Interlinkage in the Grain Markets of Bangladesh," World Development, 22(7):1011-1030, 1994

Fafchamps, M., "Solidarity Networks in Pre-Industrial Societies: Rational Peasants with a Moral Economy," Economic Development and Cultural Change, 41(1): 147-174, October 1992

Fafchamps, M., "The Enforcement of Commercial Contracts in Ghana," World Development, 24(3): 427-448, March 1996

Fafchamps, M., Market Emergence, Trust and Reputation, Stanford University, Stanford, February 1998

Fafchamps, M., and Lund, S., Risk Sharing Networks in Rural Philippines, Department of Economics, Stanford University, Stanford, October 1998. (mimeograph)

Fafchamps, M., and Minten, B., Relationships and Traders in Madagascar, IFPRI-MSSD Discussion Paper no 24, IFPRI, Washington DC, July 1998a

Fafchamps, M. and Minten, B., Returns to Social Capital among Traders, IFPRI-MSSD Discussion Paper no 23, IFPRI, Washington DC, July 1998b

Fafchamps, M. and Minten, B., Property rights in a Flea Market Economy, Department of Economics, Stanford University, Stanford, 1999. (mimeograph).

Fukuyama, F., Trust: The Social Virtues and the Creation of Prosperity, the Free Press Paperbacks, New York, 1995

Gambetta, D., Trust: Making and Breaking Cooperative Relations, Basil Blackwell, New York, 1988

Ghosh, P. and Ray, D., "Cooperation in Community Interaction Without Information Flows," Review of Economic Studies, 63:491-519, 1996

Granovetter, M., "Economic Action and Social Structure: The Problem of Embeddedness," American Journal of Sociology, 91(3): 481-510, 1985

Granovetter, M., "The Economic Sociology of Firms and Entrepreneurs," The Economic Sociology of Immigration: Essays on Networks, Ethnicity, and Entrepreneurship, p.128-165, Alejandro Portes (Ed.), Russell Sage Foundation, New York, 1995

Greif, A., "Contract Enforceability and Economic Institutions in Early Trade: The Maghribi Traders' Coalition," American Economic Review, 83(3):525-548, June 1993

Greif, A., "Cultural Beliefs and the Organization of Society: A Historical and Theoretical Reflection on Collectivist and Individualist Societies," Journal of Political Economy, 102(5): 912-950, 1994

Helliwell, J.F., and Putnam, R.D., "Economic Growth and Social Capital in Italy," Eastern Economic Journal, 21(3):295-307, 1995

Kandori, M., "Social Norms and Community Enforcement," Review of Economic Studies, 59:63-80, 1992

Klitgaard, R., Adjusting to Reality: Beyond "State versus Market" in Economic Development, Economic Center for Economic Growth, ICS Press, San Francisco, 1991

Knack, S., Keefer, P., "Does Social Capital have an Economic Pay-off? A Cross-Country Investigation," Quarterly Journal of Economics, 112(4):1251-1288, 1997

Kranton, R.E., "Reciprocal Exchange: A Self-Sustaining System," American Economic Review, 86(4):830-851, September 1996

Mendoza, M.S., Randrianarisoa, C., Structure and Behavior of Traders and Market Performance, 1998, IFPRI. (mimeo)

Minten, B., Vivre avec des prix variables: une analyse du marche urbain d'Antananarivo, Economie de Madagascar, No. 2, 1997, pp. 129-152 (Antananarivo)

Minten, B., Randrianarisoa, C., and Zeller, M., Niveau, Evolution et Determinants des Rendements du Riz, Cahier de la Recherche sur les Politiques Alimentaires, No. 8, IFPRI-FOFIFA, 1998, Antananarivo

Minten, B. and Kyle, S., The impact of distance and road quality on food collection, marketing margins, and traders' wages: Evidence from the former Zaire, Journal of Development Economics, forthcoming

Montgomery, J.D., "Social Networks and Labor-Market Outcomes: Toward an Economic Analysis," American Economic Review, 81(5):1408-1418, December 1991

Narayan, D. and Pritchett, L., Cents and Socialibility: Household Income and Social Capital in Rural Tanzania, Policy Research Department, the World Bank, Washington DC, August 1996. (mimeograph)

Palaskas, T.B. and Harriss-White, B., "Testing Market Integration: New Approaches with Case Material from the West Bengal Food Economy," Journal of Development Studies, Vol. 30, No. 1, October 1993, pp. 1-57

Platteau, J., “Behind the Market Stage Where Real Societies Exist: Part II – the Role of Moral Norms,” Journal of Development Studies, 30(4):753-815, July 1994

Putnam, R.D., Leonardi, R., and Nanetti, R;Y., Making Democracy Work: Civic Institutions in Modern Italy, Princeton University Press, 1993

Secaline, Evaluation de la situation alimentaire et nutritionelle à Madagascar, Antananarivo, 1996

Shuttleworth, G., “Policies in Transition: Lessons form Madagascar,” World Development, 17(3):397-408, March 1989

Staal, S., Delgado, C., and Nicholson, C., “Smallholder Dairying under Transaction Costs in East Africa,” World Development, 25(5), May 1997, pp. 779-794

Temple, J. and Johnson, P.A., “Social Capability and Economic Growth,” Quarterly Journal of Economics, 113(3):965-990, August 1998

Table 1: Characteristics of agricultural traders in Madagascar

	Unit	Wholesaler	Retailer with fixed selling point	Retailer w/o fixed selling point	Assembler	Total
A. Sample distribution						
Aggregate	%	30	44	15	11	100
	Number	226	328	91	80	725
Antananarivo	Number	83	36	7	11	130
Vakinankaratra	Number	40	75	13	24	146
Fianarantsoa - Hauts Plateaux	Number	48	99	2	19	179
Fianarantsoa - Cote/Falaise	Number	22	60	26	8	84
Majunga - Plaines	Number	24	31	43	18	89
Majunga - Hauts Plateaux	Number	9	27	91	80	97
B. Human capital						
Average age	years	38	37	33	40	37
% male	%	68	48	30	69	54
% married	%	83	77	59	87	79
Highest educational attainment (%)						
- Primary - Secondary I schooling	%	53	65	66	46	60
- Secondary II to higher schooling	%	47	35	34	54	40
Average number of years in business	years	8	6	3	7	6
No of languages spoken	Number	1.51	1.47	1.17	1.68	1.47
C. Labor						
Total number of man months:		66.9	26.7	12.2	57.3	40.2
Owner	man-months	10.9	11.4	9.7	9.4	10.8
Family	man-months	13.2	10.1	1.9	11.3	10.0
Permanent	man-months	26.6	3.9	0.6	26.5	12.9
Temporary	man-months	16.2	1.2	0.1	10.1	6.6
In business on a full-time basis	%	93	95	74	69	89
In business all-year round	%	85	94	68	47	83
D. Characteristics operation						
Traders in rice						
who purchase from less than 25 km	%	53.5	79.3	83.8	49.4	56.8
who purchase from more than 100 km	%	8.8	2.1	0.9	15.4	9.4
Working capital	$	3656	566	209	6366	2109
Vehicles	Number	0.19	0.05	0.01	0.47	0.14
Storage capacity	MT	37	8	3	94	26
Equipment value	$	651	53	11	1308	372
Monthly value sales	$	5545	1310	390	8713	3294
Monthly value purchases	$	4349	1259	320	7560	2815
Gross margin per month	$	813	130	75	1872	489

Table 2: Factors important for success as perceived by the traders (cumulative %)

A. Personal reputation and relationships	
Very important	71
Important	85
A little bit important	95
Not important	100
B. Access to credit	
Very important	11
Important	30
A little bit important	61
Not important	100
C. Granting credit	
Very important	3
Important	18
A little bit important	50
Not important	100
D. Purchase price	
Very important	30
Important	74
A little bit important	95
Not important	100
E. Sales price	
Very important	35
Important	83
A little bit important	98
Not important	100
F. Transport equipment	
Very important	27
Important	51
A little bit important	68
Not important	100
Number of observations	729

Table 3: Use and access to finance and credit

A. Main source of funding (%):	
own funds	89.0
formal credit	0.3
informal credit	2.2
own funds and formal credit	1.2
own funds and informal credit	7.3
Total	100.0
B. Use of bank or financial institution	
% of traders who have bank account	15.5
% of traders who have line of credit	1.2
% of traders who have savings account	10.4
% of traders member of "tontine"	1.0
% of purchases by check	0.4
% of sales by check	0.4
C. Use of credit	
% of purchases on credit	15.9
% of purchases cash	82.0
% of purchases with forward ordering	1.8
% of sales on credit	13.7
% of sales cash	85.6
% of sales after deposit	0.6
Number of observations	729

Table 4: The use of institutions for resolution of problems

Traders that used this institution since the start of business	**N**	% of traders
1. Third person/mediator	729	13.99
2. Police	729	3.98
3. Lawyer	729	0.55
4. Court	729	0.69
Conflict resolution technique for last incidence	N	% of traders
1. theft		
went to the police after theft	56	37.50
went to court after theft	56	10.71
2. contractual problem with supplier		
Direct negotiation with supplier	178	85.96
Seek help of mediator	178	3.37
Seek help of lawyer	178	0.00
Treat to go to the police	178	0.00
Treat to go to court	178	0.56
3. contractual problem with client		
Direct negotiation with supplier	220	93.64
Seek help of mediator	220	9.09
Seek help of lawyer	220	0.45
Treat to go to the police	220	3.64
Treat to go to court	220	0.91

Table 5: Risk sharing and access to financial help

		firm size			
		small	medium	large	Total
Has ever helped others	%	71%	79%	80%	77%
Has ever been helped by others	%	75%	77%	74%	75%
People who can help	No	1.76	2.46	2.73	2.32
Beliefs:					
"The rich have more friends than the poor"	Index[1]	1.25	1.45	1.56	1.42
"The poor are poor because they have nobody to assist them"	Index	2.90	2.94	2.98	2.94
"I am only proud of what I accomplish without others' help"	Index	1.39	1.82	1.75	1.65
"I solve my financial problems by myself"	Index	1.68	1.53	1.48	1.56
"I help others when they are in need"	Index	2.47	2.10	2.07	2.21
"I can count on my friends and family when in trouble"	Index	2.60	2.40	2.05	2.35
"If my business failed, I would have to sell my possessions to survive"	Index	3.82	3.42	3.56	3.60
"If I became poor, my family and friends would help me"	Index	2.74	2.69	2.47	2.63
"If my business prospers, my family and friends will live at my expenses"	Index	2.43	2.93	3.06	2.81
Number of observations		227	254	243	739

[1]ranked from 1=quite true to 5=quite false

Table 6: Choice and regularity in supply

	Firm size				Number of
	Small	Medium	Large	Total	observations
The trader does not find suppliers (%):					
Yes, often	15.3	9.5	9.8	11.5	84
No, never	57.9	53.3	55.1	55.4	404
Sometimes	26.9	37.2	35.1	33.1	241
Possibility of choice between suppliers (%):					
Always	47.1	41.3	48.6	45.7	333
Often	35.5	26.9	27.8	30.0	219
Seldom	17.4	31.8	23.7	24.3	177
% of traders who buy from regular suppliers	37.2	65.7	71.0	58.0	729
Relation between main supplier and trader is only commercial (%):	80.0	85.5	85.6	84.4	729
% of traders that face an infinite number of suppliers	20.2	8.7	26.1	18.4	729
Number of suppliers if number is limited	14.4	17.4	18.6	16.8	595
Number of regular suppliers	1.5	3.5	5.2	3.4	729
Number of years that regular suppliers exist	1.2	2.8	3.3	2.4	729
% of purchases coming from regular suppliers	24.1	45.4	47.7	39.1	729
Solutions when the quality of the product of supplier is bad (%):					
"It is my problem"	69.0	48.8	45.7	54.5	397
"The supplier partly refunds me"	11.2	23.6	24.5	19.8	144
"The supplier gives me other products"	7.0	7.0	11.0	8.4	61
"Other"	12.8	20.7	18.8	17.4	127
Total	100.0	100.0	100.0	100.0	729
Buy from unknown suppliers (%)					
Yes	71.9	71.1	76.3	73.1	533
No	21.5	22.3	16.7	20.2	147
Sometimes	6.6	6.6	6.9	6.7	49

Table 7: Choice and regularity in demand

	Firm size				Number of
	Small	Medium	Large	Total	observations
The trader does not find clients (%):					
Yes, often	17.4	16.1	14.3	15.9	116
No, never	64.5	60.7	60.4	61.9	451
Sometimes	18.2	23.1	25.3	22.2	162
Possibility of choice between clients (%)					
Always	61.6	48.8	57.1	55.8	407
Often	22.7	18.6	15.5	18.9	138
Seldom	15.7	32.6	27.3	25.2	184
% of traders who sell to regular clients	31.4	58.7	73.1	54.5	397
Relation between clients and trader is only commercial (%)	88.2	93.0	97.2	94.0	373
% of traders that face an infinite number of clients	70.2	70.7	63.3	68.0	729
Number of clients if number is limited	34.9	47.5	41.3	41.2	233
Number of regular clients	2.1	4.6	11.3	6.0	729
Number of years that regular clients exist	0.8	2.3	3.3	2.1	729
% of sales to regular clients	15.1	25.7	40.7	27.2	729
Solutions when the quality of product for the client is bad (%):					
"It is his problem"	76.9	58.3	51.8	62.3	454
"I partly refund him"	8.7	19.4	21.2	16.5	120
"The supplier gives me other products"	4.5	5.4	4.5	4.8	35
"Other"	9.9	16.9	22.4	16.5	120
Total	100.0	100.0	100.0	100.0	729
Sell to unknown clients (%)					
Yes	96.3	96.7	95.5	96.2	701
No	3.3	2.1	3.7	3.0	22
Sometimes	0.4	1.2	0.8	0.8	6

Table 8: Acess and use of marketing services

	Wholesaler	Retailer with		Assembler	Total
		fixed selling point	w/o fixed sell. point		
A. Storage					
% of traders who have access to storage facilities	81.4	82.4	73.4	90.0	81.8
% of traders who rent storage facilities	13.3	12.7	3.2	20.0	12.5
Principal reason for storage (%):					
Wait for buyers	68.1	78.8	86.8	56.1	74.1
Spread income over the year	2.5	1.8	3.3	4.5	2.5
Wait for a better price	15.7	7.7	6.6	24.2	11.8
Other	13.7	11.7	3.3	15.2	11.5
Total	100.0	100.0	100.0	100.0	100.0
B. Transport					
% of traders who use transportation services	83.6	79.3	58.5	76.3	77.6
Traders use the same journey to buy or sell products (%):					
Seldom	11.0	3.2	5.6	13.3	6.9
Sometimes	31.0	20.1	25.9	23.3	24.2
Often	16.6	35.7	42.6	31.7	30.5
Always	41.4	41.0	25.9	31.7	38.4
Total	100.0	100.0	100.0	100.0	100.0
% of traders who report choice between different transporters	62.5	78.7	61.0	75.0	71.3
Traders who travel with the same transporter (%):					
Always	11.2	9.2	16.7	14.7	10.9
Often	27.3	55.2	40.5	50.0	44.1
Seldom	61.5	35.6	42.9	35.3	45.0
Total	100.0	100.0	100.0	100.0	100.0
% of the traders who have only commercial links with transporters	97.9	98.0	100.0	92.0	97.8
Number of observations	226	329	94	80	729

Table 9: Access and sources of market intelligence and market news

	Wholesaler	Retailer with fixed selling point	Retailer with w/o fixed sell. point	Assembler	Total
% of traders who have a phone	8.0	3.0	1.1	10.0	5.1
% of traders who have access to a phone	54.9	59.3	61.7	43.8	56.5
% of traders who do never use a phone for business	74.3	88.4	98.9	73.8	83.8
% of traders who have a fax	0.9	0.6	0.0	0.0	0.5
% of traders who have access to a fax	29.2	21.6	7.4	18.8	21.8
% of traders who do never use a fax for business	98.7	99.1	100.0	100.0	99.2
Main sources of information (%):					
With respect to prices					
Suppliers	35.4	19.1	12.8	26.3	24.1
Other traders	41.6	69.9	85.1	41.3	59.9
Clients	5.8	2.1	1.1	11.3	4.1
Messengers	14.2	6.1	0.0	16.3	8.9
With respect to demand					
Customers	70.8	78.1	79.8	76.3	75.9
Other traders	16.4	17.9	18.1	8.8	16.5
With respect to supply					
Suppliers	61.1	67.8	69.1	65.0	65.6
Other traders	22.1	26.1	23.4	13.8	23.2
Number of observations	226	329	94	80	729

Table 10: Credibility of clients/suppliers

		Type of transaction beyond cash-and-carry transactions[1]		
		Credit from supplier	Forward ordering from supplier	Credit from client
A. Requirements to go beyond				
% of traders that would never use this mode on the first transaction	%	92.3	83.7	94.7
% of traders that require the following conditions:				
- Form	%	0.5	2.0	1.8
- Recommendation	%	11.3	22.4	17.1
- Collateral	%	1.5	2.0	2.4
- frequent number of transactions	%	79.9	65.3	71.1
-Others	%	18.9	44.9	39.5
Number of transactions required if frequent number is required	Number	8.9	11.3	12.7
B. Conditions of deal				
Discount if paid in cash (%)	%	1.5	-	2.0
Delay offered (in days)	Number	6.1	6.9	12.7
The trader settles the deal later than agreed upon:				
Never	%	17.0	28.6	18.9
Seldom	%	24.2	53.1	35.3
Sometimes	%	38.7	12.2	33.5
Often	%	20.1	6.1	12.2
The trader has to settle the previous deal before obtaining new one	%	77.8	77.6	63.1
Stop in supplies after particular limit	%	60.4	100.0	87.2
C. Implications in case of problems				
Threat to go to the police in case of problems	%	2.1	6.1	4.7
Threat to go to court in case of problems	%	0.5	0.0	1.8
If traders have problems with one, others will refuse to deal with him:				
- None of the other traders	%	11.3	38.8	21.2
- Some of the other traders	%	40.2	36.7	58.4
- Most of the other traders	%	31.4	10.2	15.3
- All of the other traders	%	17.0	14.3	5.0
Ease to find a new supplier of the same services if you lose one:				
Very easy	%	8.2	-	25.3
Rather easy	%	16.0	-	49.8
Rather difficult	%	44.3	-	18.9
Very difficult	%	31.4	-	6.0
Number of observations		194	49	339

[1]For the traders that use this mode of transaction

Table 11: Quality variation and verification

	Wholesaler	Retailer with		Assembler	Total
		fixed selling point	w/o fixed sell. point		
A. Variation of quality					
Quality of products varies systematically by geographical origin (%)					
A lot	47.3	36.6	15.4	31.3	36.7
A little bit	51.8	57.9	69.2	57.5	57.4
Not at all	0.9	5.5	15.4	11.3	5.9
Total	100.0	100.0	100.0	100.0	100.0
Quality of products within region varies (%)					
Never	3.5	5.2	16.5	11.3	6.8
Seldom	41.6	36.0	20.9	43.8	36.7
Sometimes	38.5	37.8	39.6	27.5	37.1
Often	12.8	16.2	14.3	10.0	14.2
Always	3.5	4.9	8.8	7.5	5.2
Total	100.0	100.0	100.0	100.0	100.0
Price of product varies with quality (%)					
A lot	40.7	30.2	36.3	20.0	33.1
A little bit	55.3	65.2	52.7	67.5	60.8
Not at all	4.0	4.6	11.0	12.5	6.1
Total	100.0	100.0	100.0	100.0	100.0
B. Quality verification					
Trader *always* verifies quality before purchase (%)	81.4	81.1	95.6	92.5	84.3
Client *always* verifies quality before purchase (%)	85.4	82.6	95.6	88.8	85.8
Person reponsable for the verification of quality (%)					
Owner/manager himself	92.5	94.5	98.9	83.8	93.2
Family aide	5.3	4.0	1.1	7.5	4.4
Employee	1.3	0.6	0.0	3.8	1.1
Agent collector	0.4	0.3	0.0	2.5	0.6
Nobody	0.4	0.6	0.0	2.5	0.7
Total	100.0	100.0	100.0	100.0	100.0
Number of observations	226	328	94	81	729

Table 12: Determinants of social capital, labor and physical capital

		Social capital										Labor		Physical capital	
		Number of relatives in trade		Number of people who can help		Number of traders known		Number of clients known personally		Number of suppliers known personally		Manpower (Log in man-months)		Equipment (Log in man-months)	
		Coef.	*t stat.*	*Coef.*	*t stat.*	*Coef.*	*t stat.*	*Coef.*	*t stat.*	*Coef.*	*t stat.*	*Coef.*	*t stat.*	*Coef.*	*t stat.*
Years of schooling of owner/manager	level	0.0079	1.352	0.0075	1.205	0.0029	0.347	0.0116	1.098	0.0369	**3.925**	0.0387	**5.403**	0.1517	**6.421**
age of owner/manager	level	0.0078	0.718	0.0135	1.153	0.0330	**2.089**	0.0279	1.418	0.0427	**2.438**	0.0226	**1.690**	0.0601	1.364
(age of owner/manager)2	level	-0.0001	-0.965	-0.0002	-1.325	-0.0004	**-2.019**	-0.0003	-1.083	-0.0004	**-1.954**	-0.0001	-0.490	-0.0003	-0.521
gender	1=male	-0.0198	-0.514	-0.0012	-0.028	-0.1315	**-2.352**	-0.0522	-0.749	-0.0844	-1.362	-0.1618	**-3.418**	-0.5267	**-3.375**
Years of experience in agricultural trade	log	0.0409	1.345	0.0785	**2.405**	0.3286	**7.445**	0.2299	**4.176**	0.1884	**3.847**	0.1238	**3.312**	0.5767	**4.680**
Dummy if full time trader	1=yes	0.0080	0.123	0.0436	0.628	0.0017	0.018	-0.0023	-0.020	0.0440	0.423	0.0469	0.590	-0.7342	**-2.802**
Dummy if trader all year round	1=yes	-0.0984	**-1.691**	-0.0445	-0.712	0.1250	1.480	0.1355	1.286	-0.1797	**-1.917**	0.1360	**1.900**	-0.2846	-1.206
In capital city	1=yes	-0.3420	**-2.341**	0.1575	1.004	0.3152	1.486	0.5625	**2.126**	-0.6174	**-2.623**	-0.0986	-0.549	-1.3378	**-2.259**
In another city	1=yes	0.1608	**3.234**	0.0241	0.452	-0.1695	**-2.349**	-0.2780	**-3.088**	-0.2753	**-3.437**	-0.0575	-0.941	-0.1803	-0.895
In Vakinankaratra region	1=yes	-0.3816	**-2.647**	-0.1924	-1.243	0.3125	1.493	0.2212	0.848	-0.5748	**-2.475**	-0.1196	-0.675	-0.1443	-0.247
In Fianar/Haut Plateaux region	1=yes	-0.4611	**-3.194**	-0.1881	-1.214	0.0081	0.039	-0.2882	-1.102	-1.1810	**-5.078**	0.0143	0.081	-2.5406	**-4.341**
in Fianar/Cote et falaise region	1=yes	-0.4546	**-3.030**	-0.0623	-0.387	-0.0665	-0.305	-0.3443	-1.267	-1.1604	**-4.800**	-0.1211	-0.656	-3.0002	**-4.932**
In Majunga/plaines region	1=yes	-0.6612	**-4.456**	-0.2832	**-1.777**	-0.0262	-0.122	-0.7347	**-2.734**	-1.6255	**-6.800**	-0.6186	**-3.390**	-4.0686	**-6.764**
In Majunga/plateau region	1=yes	-0.6078	**-4.254**	-0.2862	**-1.866**	-0.2301	-1.109	-0.6517	**-2.519**	-1.6372	**-7.112**	-0.5777	**-3.287**	-5.0498	**-8.718**
Intercept		0.6358	**2.542**	0.7666	**2.854**	0.6857	**1.888**	0.7378	1.629	0.9240	**2.293**	2.0824	**6.770**	3.7861	**3.734**
Number of observations		704		704		704		704		704		704		704	
R-squared		0.088		0.094		0.192		0.265		0.317		0.349		0.495	

Table 13: Determinants of total sales and total value added

			Value added						Total sales			
			Coef.	*t stat.*	*Coef.*	*t stat.*	*Coef.*	*t stat.*	*Coef.*	*t stat.*	*Coef.*	*t stat.*	*Coef.*	*t stat.*
A. Capital and Equipment														
Working capital	(*)	log			0.4445	**4.668**	0.3990	**4.438**			0.3984	**4.878**	0.3519	**4.649**
Dummy if subsidiary		1=yes			0.9873	**3.486**	0.9541	**3.507**			0.9438	**4.021**	0.9538	**4.290**
Value of equipment		log			-0.0113	-0.301	-0.0057	-0.157			0.0304	1.027	0.0313	1.114
Storage capacity		log			-0.0167	-0.210	0.0518	0.668			-0.0153	-0.255	0.0438	0.767
Number of vehicles		log			-0.3080	-1.032	-0.3482	-1.191			-0.4928	**-2.134**	-0.4861	**-2.191**
Utilization of telephone	(*)	1=yes			-0.1173	-0.330	0.0075	0.022			0.4947	**1.701**	0.5986	**2.186**
B. Labor and management														
Manpower (in months/year)	(*)	log			1.1143	**3.832**	0.8345	**2.879**			0.9868	**4.326**	0.7236	**3.234**
Dummy if full time trader		1=yes	0.1294	0.471	0.0243	0.106	0.0671	0.304	0.1699	0.828	0.1630	0.978	0.1340	0.854
Dummy if trader all year round		1=yes	-0.1308	-0.588	0.1338	0.609	0.1889	0.896	0.0290	0.160	0.3219	**1.921**	0.3834	**2.412**
Years of schooling of owner/manager		level	0.1191	**4.985**	0.0370	**1.709**	0.0294	1.422	0.1138	**5.582**	0.0280	1.577	0.0218	1.299
Years of experience in agricultural trade		log	0.6087	**5.654**	0.2545	**2.596**	0.1456	1.521	0.5034	**5.479**	0.1954	**2.483**	0.0913	1.199
Speak another language		1=yes	-0.3235	**-1.883**	-0.2951	**-1.941**	-0.2055	-1.399	-0.2325	**-1.572**	-0.3147	**-2.525**	-0.2227	**-1.876**
C. Social capital														
Number of relatives in agricultural trade		log	-0.4093	**-2.421**	-0.6390	**-4.341**	-0.2714	**-2.208**	-0.4032	**-2.762**	-0.6292	**-5.195**	-0.2737	**-2.794**
Number of traders known		log					0.2737	**3.124**					0.1924	**2.837**
Number of people who can help		log					0.1874	**1.682**					0.2875	**3.270**
Number of suppliers known personally		log					0.1230	1.567					0.0721	1.149
Number of clients known personally		log					0.0649	0.797					0.1103	**1.704**
D. Shocks														
Aggregate sales shock		ratio	-0.1079	-0.781	0.2589	**2.138**	0.1721	1.471	-0.0173	-0.156	0.2422	**2.664**	0.1926	**2.235**
Theft in the last 12 months		1=yes	0.1954	0.720	-0.2797	-1.214	-0.4126	**-1.861**	0.4170	**1.915**	-0.1250	-0.703	-0.2560	-1.518
E. Location														
In capital city		1=yes	-0.8216	-1.059	-0.6809	-1.045	-0.9366	-1.496	-0.8866	**-1.966**	-0.3714	-0.995	-0.5231	-1.482
In another city		1=yes	0.1715	0.947	0.2367	1.420	0.2521	1.571	0.2144	1.370	0.1798	1.316	0.1792	1.386
In Vakinankaratra region		1=yes	-0.2206	-0.285	-0.6385	-0.968	-0.8061	-1.265	-0.5145	-1.159	-0.4561	-1.296	-0.4315	-1.292
In Fianar/Haut Plateaux region		1=yes	-0.3222	-0.417	-1.0887	-1.650	-0.9559	-1.504	-1.1145	**-2.482**	-1.4706	**-3.959**	-1.2057	**-3.403**
in Fianar/Cote et falaise region		1=yes	-0.3625	-0.464	-0.8636	-1.282	-0.6929	-1.070	-1.3415	**-2.884**	-1.3968	**-3.634**	-1.1150	**-3.038**
In Majunga/plaines region		1=yes	-0.7281	-0.914	-0.2488	-0.365	-0.0116	-0.018	-1.7595	**-3.702**	-0.7898	**-2.023**	-0.4667	-1.250
In Majunga/plateau region		1=yes	-0.7726	-0.970	-0.5884	-0.858	-0.2611	-0.395	-2.1073	**-4.478**	-1.3310	**-3.394**	-0.9785	**-2.610**
Intercept			7.1695	**8.477**	1.4736	1.626	1.6147	**1.846**	10.0980	**20.203**	4.4555	**6.945**	4.5114	**7.447**
Number of observations			637		627		627		694		681		681	
F-value			7.17		19.70		19.62		12.51		32.19		32.47	
R-square			0.146		0.416		0.470		0.215		0.509		0.568	
(*) regarded as endogenous														
							F stat.	p-value					F stat	p-value
Joint test of non-family social capital							3.31	0.0107					4.59	0.0012

Table 14: Determinants of total value added and total sales, controling for modes of transaction

		Value added				Total sales			
		OLS		IV		OLS		IV	
		Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
Capital and Equipment									
Working capital	log	0.249	**6.890**	0.302	**3.278** (*)	0.217	**7.207**	0.326	**3.944** (*)
Dummy if subsidiary	yes=1	0.678	**2.694**	0.655	**2.137**	0.917	**4.480**	1.028	**3.797**
Value of equipment	log	0.003	0.100	-0.014	-0.367	0.041	1.672	-0.001	-0.024
Storage capacity	log	0.111	**2.061**	0.059	0.705	0.413	**3.379**	0.043	0.661
Number of vehicles	log	-0.074	-0.293	-0.309	-0.934	-0.188	-0.962	-0.573	**-2.232**
Utilization of telephone	yes=1	0.220	1.321	0.222	0.610 (*)	0.273	**1.995**	0.648	**1.987** (*)
Labor and Management									
Manpower (in months/years)	log	0.471	**4.056**	0.535	1.607 (*)	0.431	**4.833**	0.390	1.422 (*)
% of family members in total labor force	share	-0.317	-1.466	-0.986	-1.607 (*)	-0.352	**-2.009**	-1.716	**-3.139** (*)
Dummy if full time trader	yes=1	0.009	0.042	-0.050	-0.226	0.115	0.772	-0.014	-0.080
Dummy if trader all year round	yes=1	0.437	**2.527**	0.410	**1.730**	0.503	**3.732**	0.519	**2.660**
Years of schooling of owner/manager	level	0.021	1.157	0.001	0.065	0.019	1.271	0.003	0.156
Years of experience in agricultural trade	log	0.049	0.565	-0.038	-0.391	0.030	0.417	0.015	0.181
Speaks another language	yes=1	-0.237	**-1.749**	-0.119	-0.746	-0.212	**-1.892**	-0.217	-1.560
Social capital									
Number of relatives in agricultural trade	log	-0.194	**-1.693**	-0.139	-1.049	-0.258	**-2.759**	-0.222	**-1.938**
Number of traders known	log	0.175	**2.128**	0.149	1.557	0.121	**1.833**	0.125	1.514
Number of people who can help	log	0.187	**1.811**	0.190	**1.678**	0.285	**3.426**	0.231	**2.403**
Number of suppliers known personally	log	0.206	**2.570**	0.067	0.612	0.050	0.765	-0.117	-1.242
Number of clients known personally	log	-0.049	-0.673	-0.096	-1.125	0.082	1.400	0.029	0.400
Shocks									
Aggregate sales shock	ratio	0.062	0.593	0.069	0.578	0.149	**1.867**	0.182	**1.969**
Theft in the past months	yes=1	-0.480	**-2.294**	-0.399	**-1.690**	-0.262	-1.622	-0.197	-1.057
Location									
In capital city	yes=1	-1.326	**-2.181**	-1.373	**-1.721**	-0.708	**-1.968**	-0.765	-1.390
In another city	yes=1	0.379	**2.695**	0.399	**2.342**	0.343	**2.959**	0.286	**1.952**
In Vakinankaratra region	yes=1	-1.083	**-1.845**	-1.365	**-2.040**	-0.445	-1.366	-0.521	-1.305
in Fianar - Hauts Plateaux region	yes=1	-0.945	-1.627	-1.238	**-1.921**	-0.854	**-2.574**	-1.202	**-2.950**
in Fianar - Cote/Falaise region	yes=1	-0.571	-0.966	-0.955	-1.421	-0.774	**-2.238**	-1.177	**-2.724**
in Majunga - plains region	yes=1	0.145	0.240	0.014	0.022	-0.207	-0.578	-0.378	-0.899
in Majunga - plateau region	yes=1	-0.009	-0.015	0.063	0.094	-0.682	**-1.892**	-0.677	-1.590
Mode of transaction to reduce imperfect information									
Info on prices from clients and suppliers	yes=1	0.643	**4.757**	0.579	**1.820** (*)	0.444	**4.050**	0.356	1.281 (*)
Info on prices from messengers	yes=1	1.016	**5.740**	1.255	**2.765** (*)	0.566	**3.858**	0.444	1.118 (*)
Firm always inspect quality of supplies	no=1	0.394	**2.325**	0.513	1.075 (*)	0.276	**1.981**	0.200	0.506 (*)
Clients always inspect quality of supplies	no=1	-0.287	-1.617	0.187	0.388 (*)	-0.171	-1.206	0.251	0.603 (*)
Mode of transaction to deal with poor market institutions									
Share of purchases with supplier credit	share	0.474	**1.924**	0.760	1.099 (*)	0.377	**1.847**	0.710	1.170 (*)
Share of sales with credit to client	share	0.911	**2.774**	0.738	1.114 (*)	0.443	1.658	0.640	1.079 (*)
Mode of transaction to reduce high search costs									
Share of purchases from regular suppliers	share	0.067	0.435	0.800	**2.188** (*)	0.190	1.509	0.807	**2.479** (*)
Share of sales to regular clients	share	0.790	**3.413**	1.032	**1.865** (*)	0.501	**2.641**	0.033	0.064 (*)
Firm always places orders form suppliers	no=1	-0.521	**-3.494**	-0.950	**-2.736** (*)	-0.122	-1.002	-0.041	-0.136 (*)
Intercept		3.776	**5.063**	4.284	**3.665**	6.124	**12.305**	7.371	**7.722**
Number of observations		631		617		683		668	
R-squared		0.5619		0.5113		0.6241		0.5452	
(*) regarded as endogenous									
		F-stat.	p-value	F-stat.	p-value	F-stat.	p-value	F-stat.	p-value
Joint test of non-family social capital		5.53	0.000	1.81	0.126	5.53	0.000	1.81	0.126