The importance of social capital in Colombian rural agro-enterprises[1]

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Abstract: This paper characterizes and measures the contribution of social capital to the performance of 50 agro-enterprises in Colombia. Using qualitative analysis we document the functions that social capital performs within firms. To estimate social capital's contribution to firm structure and performance, quantitative indicators of firm-level use of social capital are developed based on the number and strength of external relationships that firms maintain. Econometric analysis finds that firm-level returns to relationships are positive and higher than to physical or human capital. The results suggests that while firms can increase their economic performance by investing in social capital, ameliorating the effects of the market failures that lead to use of social relations for business purposes could also improve both equity and efficiency.

Keywords: social capital, agro-industry, rural development, mixed methods, Colombia

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1. Introduction

Over the past several decades, the process of agro-industrialization[5] has transformed agriculture and rural communities in many parts of Latin America, more so than in any other part of the world (FAO, 1997). As a result of demographic change, increasing incomes, and structural adjustment/market liberalization programs, agro-

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[5] Agro-industrialization has been defined as a process involving " (1) growth of agro-processing, distribution, and farm-input activities off-farm; (2) institutional and organizational change in the relation between agri-food firms and farms, such as a marked increase in vertical coordination; (3) concomitant changes in the farm sector, such as changes in product composition, technology, and sectoral and market structures." (Wilkinson, 1995).

industrialization has expanded far beyond the traditional agro-export crops (Reardon et al, 1999). Promoting agro-industrial development is a policy goal for many governments in both developing and developed countries, in large part because it is believed that agro-industrialization can contribute not only to economic but also to social development in rural areas. In Colombia, spillovers from agroenterprise development efforts are expected to "promote social cohesion in rural communities."(Lafourcade, 2002, p. A).

The principal hypothesis of this study is that while strengthened social organization may be an outcome of agro-industrialization, social capital is also likely to be a key input into the process. Individuals and groups that can work collaboratively and establish and maintain both trust-based relationships and networks of contacts will have an advantage over their competitors who cannot. The reason is that agro-enterprise firms compete in complex supply chains that are technically demanding, information intensive and require coordination among different actors and different stages of the process. Where markets fail and transactions costs are high, social capital can make a significant contribution to firm performance by providing access to information and reducing the costs of contracting and coordination. Failure to recognize and explicitly incorporate the concept of social capital as an input into agro-industrialization may limit the effectiveness of programs and projects designed to promote and support agroenterprises.

This study addresses two main questions: 1) how is social capital important to rural agroenterprises? and 2) how important is social capital to firm performance? The first question is addressed through a primarily qualitative analysis of the functions that social capital performs within individual enterprises. The second question is tackled with quantitative methods to estimate firm-level returns to inputs, including social capital.

Using multiple methods is important because a limitation of much of the quantitative social capital literature is that while it identifies interesting and statistically significant relationships between variables, the causality and the policy implications are often not clear (Wong Kwok-fu, 2001). By integrating qualitative analysis of the functions of social capital with quantitative analysis of how social capital affects firms' structure and performance, we can better interpret results and arrive at conclusions with clear development implications.

2. Social capital and firm performance: theoretical and empirical literature

Coleman formulated the concept of social capital as way to bridge the gap between the sociologists' explanation of human behavior as determined by social factors—norms and social obligations—and the economists' assumption of rational self-interest. According to Coleman, "the function identified by the concept of social capital is the value of these aspects of the social structure to actors as resources that they can use to achieve their interests" (Coleman, 1993, p. s101). While many studies focus on community level outcomes and define social capital as a public-good (Putnam, 1993; Helliwell and Putnam, 1995; Helliwell, 1996; Krishna and Uphoff, 1998), Coleman conceived of social capital as something used by individuals to further their own personal objectives. Social capital may not be evenly distributed within the community, and that while it should generally have positive benefits for those who have access to and use it, the consequences maybe different for society as a whole (Sandefur and Laumann, 1998; Edwards and Foley, 1998). Coleman and others also distinguish between the form that

social capital takes and the function that it performs. The former will depend on the specific social structure and context, while the latter is more generalizable.

In one of the few empirical analyses of social capital in the context of agro-enterprises, Fafchamps and Minten, in a study of agricultural traders, conclude that in a world with transactions costs, the returns to social capital may be as high or higher than the returns to labor or to physical or human capital. Their definition of social capital is essentially social networks. Barr (2000a), in a study of small-scale manufacturing entrepreneurs in Ghana, looks at the contribution of networks of business-related contacts to firm performance in the context of endogenous growth theory. She finds support for her hypothesis that contacts contribute to technical information flows among enterprises, and that these flows not only make a positive contribution to individual firm performance but generate spillovers to other firms as well.

Barr (2000b) also finds that networks of contacts can provide the basis for other types of firm-level benefits such as reducing search and contract enforcement costs through information sharing. Networks can also be the basis of collective action, though this was not common and usually only involved a subset of network members. For this reason she hesitates to call networks groups because they operate in a very decentralized way.

3. Study context and data

The data for the analysis come from a sample of 50 firms in five regions of Colombia.[6] The zones were identified because they are all centers of agro-industrial activity; yet differ in their historical/cultural dynamics and institutional contexts. The sample was selected to represent small and medium-sized enterprises[7]. Some general characteristics of the agro-enterprises are presented in Table 1.

For each firm, in-depth, open-ended interviews were conducted with the owner/manager and other key informants about firm history, business practices, decision-making and conflict resolution processes, relations with other individuals and organizations, and important influences, challenges and opportunities facing the firm. In addition, quantitative data on a range of demographic and economic characteristics of firms and their owner/managers were also collected (Table 1). Venn Diagrams were used to identify and evaluate the firm's relationships with other agents in the supply chain.

4. How is social capital important? Functions of social capital in firms

Social capital was expected to perform three general functions within firms. The first was to help forms obtain information via broad networks of personal contacts maintained by firm owner/managers. The second expected function of social capital was to reduce monitoring and enforcement costs in contracting by transacting with trusted individuals and organizations. Finally, we expected that social capital would influence whether firms were able to generate and sustain collective action. Following is a brief

[6] The five regions are the 1) Caribbean Coast near the cities of Sincelejo, Sucre and Montería, Córdoba; 2) Eastern Antioquia;3) Ubaté, Cundinamarca; 4) Vélez, Santander; and 5) the area around Manizales, Caldas in the coffee-growing region

[7] In the absence of a business census, firms were identified using information provided by the local chambers of commerce, where all businesses are legally obligated to register, and by other key informants.

summary of specific ways in which social capital was observed to perform functions in each of these three general categories.

Firms used their information networks for four main purposes: 1) to identify and contact clients; 2) to access market information, mainly through other actors in the supply chain, 3) to access inputs, especially agricultural products, and 4) to obtain technical and financial assistance. Trust was observed to help firms 1) maintain relationships with clients, especially in cases of involuntary non compliance on the part of firms 2) reduce the cost of assuring producer compliance; 3) manage crises; and 4) obtain credit. A close relationships was observed between the network and trust functions of social capital. Networks of contacts opened doors for firms, however, unless firms were able to consolidate the new relationships and build trust, the benefits of the new relationship were generally small and short lived.

In the 50 case study enterprises, collective action contributed to firm performance in eight different ways: 1) collective commercialization, 2) collective provision of inputs, 3) collective monitoring and enforcement, 4) collective production/processing, 5) collective financing, 6) collective management of common property, 7) price fixing, and 8) collective action in related services such as infrastructure provision. This is more than double the number of functions performed by either networks or trust. The majority of collective action takes place among producers, either in their capacity as members of a cooperative or as associated producers[8] of an agro-enterprise. As expected, collective action is more common in cooperatives and associations, however it is also found among private firms.

[8] Private firms often divide the producers from whom they purchase products into associated and non-associated. Relationships between firms and associated producers are characterized by higher levels of trust and commitment.

To facilitate comparative analysis, we constructed indices of the use of different functions of social capital. Each firm was ranked on a scale of 1 (lowest) to three (highest) according to how frequently it appeared to use each of the three functions. Use of individual functions was correlated within firms, which means that firms that used one function of social capital tended also to use others. The results of a cluster analysis confirm the high correlation among use of different functions of social capital. Three of the four clusters reveal a hierarchical order across the three component functions of social capital (Table 2). These findings are also consistent with complementarities (actual or potential) identified in the qualitative analysis.

5. How important is social capital? Quantitative analysis of impact of social capital on firm structure and income

The previous section described ways in which firms used social capital to achieve specific objectives. The results show that firms no indeed use social capital, however they does do not tell us how important social capital's contributions are to the firm's bottom line, especially relative to those of other inputs. Until we know this we cannot say whether firms would benefit by increasing their investments in social capital. The contribution of social capital to firm performance can be measured empirically with appropriate quantitative data.

The social capital literature and the examples provided in the previous section suggest that social capital is located in personal relationships. Therefore, an empirical measure of a firm's use of social capital might be developed based on information about

the relationships that a firm maintains. The firms in the sample maintain relationships with a variety of actors. The most basic relationships are those with employees, agricultural producers, non-ag input suppliers and clients. Many firms also report relationships with a variety of other actors such as federal, state and local government agencies, NGOs, banks and other financial institutions, universities, industry organizations, intermediaries, public employees, politicians, and community organizations. The average firm has 12.5 relationships, ranging from four to 23. Relationships can also vary by quality. Of the 12.5 relations that the average firm maintains, half are considered to be strong.

To test the accuracy of number and strength of relationships as indicators of social capital, we can use the results of the cluster analysis in the preceding section which grouped firms into high, medium, and low users of social capital. Firms that were observed to use high levels of social capital have more and stronger relationships that firms that were observed to use less social capital (Table 3). This findings support the use of relationship-based variables as measures of social capital.

If the number and strength of a firm's relationships reflect its use of social capital, then in theory, we should be able to include these variables directly in a production or profit function. However theory underlying this econometric analysis assumes that markets are perfect and that demand for an input is determined entirely by relative prices and the technology parameters. In this paper, we hypothesize that use of social capital by firms is due to the existence of market imperfections, specifically information problems and transactions costs. Therefore we cannot expect the demand for social capital to be independent of supply. In fact, an analysis of the determinants of the number and

strength of a firm's relationships shows that the number of groups that a firm owner belongs to in his or her personal life is significantly and positively associated with the total number of relationships that his/her firm maintains, controlling for regional and firm-level characteristics (Table 4). We would not expect such group membership to influence firm productivity directly, but it could be expected to do so indirectly via facilitating social contacts.

To measure the contribution of social capital to firm performance, we estimate a productivity equation in which revenue per employee is estimated as a function of labor, physical, human and social capital, firm-level characteristics and regional dummy variables. Because, as shown above, some of these same predictors also influence social capital, a two-stage estimation procedure is required. In the first stage, the endogenous social capital variable (number of relationships or number of strong relationships) is regressed on the independent variables plus the instrument "number of groups to which the owner belongs". In the second stage, the predicted values of social capital are used to estimate the productivity equation.

According to the results, the total number of relationships and the number of strong relationships that a firm maintains contribute positively and significantly to revenue per employee (Table 5). The elasticity of social capital is higher than that of physical capital, meaning that an increase in number of relationships has a higher impact on revenue/worker than a proportional increase in machinery. The difference is even greater when the increase is in strong relationships. Returns to labor were negative, meaning that labor productivity is higher in smaller firms. Human capital, as measured by

the owner/manager's education level, does not appear to influence firm productivity directly but rather indirectly through its influence on social capital (Table 4).

6. Conclusions and discussion

This paper documented how rural agro-enterprises use social relationships to further their economic objectives. Firms used social capital in a variety of ways to gain access to information, reduce contracting costs via trust, and support collective action. Social capital, as measured by the number of relationships that a firm maintains, contributes positively and significantly to its economic performance, as measured by revenue per worker. Econometric analysis shows that increasing investment in social capital yields higher returns than in physical capital, human capital or labor.

Several policy implications arise from these results. According to the econometric results, firms can benefit from broadening their networks and by strengthening their existing relationships with other actors in the supply chain. The qualitative analysis cites many examples of how this might be done, for example by improving communication and seeking feedback from clients, or by absorbing transactions costs in maintaining collective action[9].

While building and strengthening firm-level relationships can improve individual firm performance, the fact that firms are using personal relationships for professional objectives is a sign of market failure. In theory, social welfare could be improved by ameliorating these failures so that firms compete on the basis of productivity. In reality,

[9] A more detailed presentation of the results of the qualitative analysis was exclude from this document for lack of space but is available from the author.

personal relationships will always play a role in economic activity because information is never perfect, contracts are never complete and transactions costs are never zero. However to the extent that technological or institutional innovations can decrease reliance on personal relationships by promoting the emergence of alternative suppliers and markets for the services that are currently provided by social capital, both efficiency and equity are likely to increase. This is essentially the objective of the growing field of business development services (BDS). The results of this study suggest that careful analysis of which types of services are currently being provided by which types of relationships and why, would be a good place to start an effort to design or implement alternative service provision scheme.

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Table 1 Selected characteristics of the sample rural agroenterprises, by region (n=50)

	Caribbean Coast (n=10)	Antioquia (n=10)	Ubaté (n=10)	Vélez (n=10)	Coffee Zone (n=10)
Percent that are member-owned	40	30	0	0	10
Average number of employees	12.2 (7.1)	18.2 (9.1)	6.7 (12.7)	6.5 (4.5)	25.2 (22)
Average age of firm (years)	10 (5.7)	8.3 (3.2)	21.3 (14.5)	23.6 (16.6)	8.5 (5.8)
Average annual value of production (USD)	41,489 (25,285)	237, 144 (314,525)	473,245 (1,242,254)	63,200 (64,211)	459,111 (546,827)
Average value of capital equipment	86,435 (163,138)	64,115 (79,017)	74,720 (147,635)	14,124 (9,770)	145,200 (229,996)
Owner Education Index (from 1 (low) to 5 (highest)	1.5	2.9	2.6	1.6	4.0
% of owners with experience outside region	78	78	60	70	50
# of groups to which owners belong in personal lives	2.6 (3.2)	1.9 (2.5)	.3 (.48)	1.4 (1.6)	2.5 (.97)

Standard errors in parentheses

Table 2 Average value of social capital indicator* by group, from cluster analysis

	Collective Action	Information	Trust
Group 1 High (n=11)	2.91	2.64	2.64
Group 2 Medium (n=10)	2.10	1.80	1.60
Group 3 Low (n=25)	1.12	1.32	1.52
Group 4 High information (n=4)	1.00	3.00	1.50

* Indicators are based on rakings of social capital use by firms, with 1= low, 2=medium 3 = high

Table 3 Firm relationships by social capital clusters (n=49)

	Total # of relationships*	Total # of strong relationships**
High (n=10)	15.9	8.7
Medium (n=10)	13.4	7.0
Low (n=25)	11.1	5.2
High information (n=4)	11.5	4.0

**= sig <.01 * = sig <=.05

Table 4 Results of analysis of determinants of use of social capital (n=47) (coefficients are standardized with intercept 0)

	# Relationships (OLS)	# Strong relationships (OLS)
Constant	***	***
Owner's Education index	.288**	.107
# Groups to which owner belongs	.451***	.429***
Coop dummy	-.231*	-.159
# employees	.177	.159
Dummy for experience outside the community	-.035	-.040
Caribbean coast dummy	-.451***	-.587***
Ubate dummy	-.594***	-.506***
Antioquia dummy	-.303**	-.117
Coffee Zone dummy	-.332*	-.427
R2	.510	.651
Durbin Watson	2.006	1.957

***= sig <.01 ** = sig <=.05 * = sig <=.10

Table 5 Results of estimation of returns to social capital using 2 stage least squares (n=45)

	Log Annual Revenue per Worker (Col pesos)	
Constant	**	***
Log Number of employees	-.348*	-.360*
Log Value of Machinery	.412**	.420**
Log Number of relationships	.512*	
Log Number of strong relationships		.705*
Percent of relationships that are strong	.222	-.209
Owner's Education index	.178	.177
Experience outside the community dummy	-.518***	-.561***
Coop dummy	-.087	-.124
Caribbean Coast dummy	.210	.254
Antioquia dummy	.236	.281.
Ubaté dummy	.731***	.726***
Velez dummy	.191	.172
R2	.480	.474

***= sig <.01 ** = sig <=.05 * = sig <=.10