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# Applications of Social Capital Theory

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## *Abstract*

Experiments and studies were conducted to investigate the role of social capital. Social capital (relationship to others) is a productive asset which is a substitute for and complement to other productive assets. The productivity of social capital leads to the expectation that firms and individuals invest in relationships. Data were collected to answer the following questions: Does the identity (relationship) of trading partners affect selling and buying prices; the acceptance of catastrophic risk; the choice of share or cash leases in agriculture; loan approval; and banks investment to retain customers? The evidence is in the affirmative.

**Key Words:** behavioral economics, institutional economics, social capital

Economists have been extending the concept of capital beyond its original meaning (eg. tools and machines) used in the production of other goods to human capital referring to skills and knowledge. Can the concept be extended to social capital referring to the relationships between people? Some speak of organizations and institutions as resources affecting production. James Coleman uses the term social capital to refer to all human relationships. He defines social capital in functional terms, i.e. "the value of these aspects of social structure to actors as resources that they can use to achieve their interests (S101)." He regards organizational structures as resources which "can be combined with other resources to produce different system-level behavior or, in other cases, different outcomes for individuals."

Coleman's concept of social capital includes: obligations, expectations, and trustworthiness of structures; information channels; and norms and effective sanctions. All of these social structures or institutions involve cognition and mental images. In this paper, we want to focus on only that part of human relationships which have an emotive dimension. The emotive dimension is reflected in such words as love, caring, sense of

community, sympathy, guilt, and hatred. Some economists have trouble with these terms, but they have nevertheless entered the mainstream literature as a "warm glow."

In this paper, we explore how emotive human relationships are resources for production and consumption and thus take their place among other sources of capital inputs. Strictly speaking, a production function is a matter of physics--there are only energy flows and physical inputs. Social relations may condition the realization of the physics, but are not themselves inputs. Social relationships may, however, be substitutes for physical inputs, e.g. trust can substitute for police surveillance and legal services. So we can speak of social relationships as productive inputs in the same sense as Douglass North speaks of institutions saving transaction costs.

Two contrasting models will be specified before turning to the experimental and survey data. One model is the familiar rational choice model and the other is a cognitive model with less demands on mental processing capacities.

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## Rational Choice Model

Consider first the rational choice model of utility maximization for individual  $i$ . To the usual argument that utility is a function of own income ( $\pi_i$ ) we add the possibility that utility is a function of others' income ( $\pi_j$ ). The importance of  $\pi_j$  in individual  $i$ 's utility function depends on a social capital *weight*  $K_{ij}$  that measures  $i$ 's relationship to  $j$  from  $i$ 's perspective. This social capital weight is itself a function of a relationship ( $R_{ij}$ ) between the parties and the opportunity and awareness to exercise it ( $D_{ij}$ ).

The relationship between two parties  $i$  and  $j$  may be sympathetic, neutral, or antipathetic. The relationship along with the opportunity and awareness to exercise it becomes social capital  $K_{ij} = R_{ij} D_{ij}$ .

The variable  $K_{ij}$  then weights others' welfare or being (usually measured as income) as it enters  $i$ 's utility function which is to be maximized. In addition, the feeling that  $j$  has towards  $i$  is a *stock* resource for  $i$  and enters  $i$ 's utility function as  $\hat{K}_{ij}$ .  $\hat{K}_{ij}$  as perceived by  $i$  is in part like a debt owed to  $i$  by  $j$  which  $i$  can draw on as needed, and in part, the opinion of others produces utility directly. One might expect that  $j$ 's caring for  $i$  is a function of  $i$ 's caring for  $j$ .

To make own income and others' income comparable we conceive of the weight applied to others' income as  $K_{ij}$  and the weight applied to own income as  $K_{ii}$ . Since  $K_{ij}$   $\pi_j$  enters as an argument in  $i$ 's utility function,  $i$ 's well being associated with this argument can be increased by an increase in  $K_{ij}$  as well as an increase in  $\pi_j$ . The utility function for  $i$  can then be written:

$$\text{Max } U_i [K_{ii} \pi_i, \hat{K}_{ij}, K_{ij} \pi_j]$$

Note that the social capital *weight*  $K_{ij}$  in individual  $i$ 's utility function may appear as a *stock* resource in the function of individual  $j$ . Whether or not  $K_{ij}$  is a source of transfer to  $j$  and thus a resource for  $j$ , it is valuable for  $i$  since it affects how  $j$ 's income affects  $i$ 's utility and substitutes for  $i$ 's income.

How does the social capital weight affect resource allocation?

1. If social capital ( $K_{ij}$ ) is *zero*, a change in the income of others ( $j$ ) has no effect on  $i$ 's utility. The only way  $i$  can increase utility is to increase own wealth or the weight applied to own wealth.

2. If social capital ( $K_{ij}$ ) is *positive*, an increase in the income of others results in an increase in  $i$ 's utility. Person  $i$  can increase own utility by transferring resources to produce wealth for  $j$ . The rational person  $i$  would calculate the rate of substitution of own wealth for others wealth to produce utility for  $i$ . The sympathetic person who is aware of  $j$  and has the possibility to interact with  $j$  has positive social capital  $K_{ij}$ .

3. If social capital ( $K_{ij}$ ) is *negative*, an increase in income of others decreases  $i$ 's utility. Person  $i$  can increase their utility by decreasing others wealth. Person  $i$  may decrease own wealth by investing in the means of destruction of  $j$ 's wealth and thereby increase own utility. This is what the Serbs do to the Bosnians or the Hutus to the Tutsis.

4. Social capital ( $K_{ij}$ ) itself may be *subject to investment and change*. Resources can be used to increase the social capital weight and thus utility even if  $i$  or  $j$ 's wealth remains unchanged. Examples are efforts to get to know others, for example by joining a club. It is the equivalent of taking a music appreciation course. A person can feel better about their tax money being transferred to the poor by becoming identified with the poor. In the first three cases above, one invests in  $W_j$  including transfers to  $j$  because of  $K_{ij}$ , while in this case, one invests in  $K_{ij}$ .

Empirically, it is difficult to characterize the motive for goods movement between  $i$  and  $j$  since  $i$  could do it to increase own utility (a kind of consumption) or it could be an investment motivated by a desire to get closer to  $j$  ( $k_{ij}$ ), or it could be an investment in altering  $j$ 's attitude toward  $i$  ( $\hat{K}_{ij}$ ). All three elements could act simultaneously.

5. The feeling ( $\hat{K}_{ij}$ ) that  $j$  has toward  $i$  is a stock resource for  $i$  which  $i$  may choose to alter through investment. Examples are price discounts and advertising designed to build loyal customers, gifts, and expressions of sympathy, caring, honor, and deference.

This social capital stock is valuable to person  $i$  since it affects  $j$ 's behavior toward  $i$  including income transfers and because  $j$ 's opinion of  $i$  as perceived by  $i$  enters directly into  $i$ 's utility. There is a relationship between the weight  $K_{ij}$  in  $i$ 's utility function and the stock  $\hat{K}_{ij}$  in  $j$ 's function,  $\hat{K}_{ij}(K_{ij})$

The utility function for  $j$  can be written:

$$\text{Max } U_j[K_{ij} \pi_j, \hat{K}_{ij}, K_{ji} \pi_i]$$

**Cognitive Model**

Social capital may be operative without being subject to calculation. Goods transfers may be cued by certain perceptions without conscious thought (Margolis). This does not imply random behavior uninfluenced by experience and environment. The brain may seek some pattern in its learned repertoire that seems to fit (make sense of the situation). When a pattern is seen, the brain may utilize no other information than what is seen--no alternatives are considered. The brain jumps to action. We can react to cognition of hungry people or a drowning victim without any consideration of cost or benefits or marginal rates of substitution between own and others income. Behavior can be conditioned by experience at a sub-conscious level. In this conception, social capital ( $K_{ij}$ ) is a patterned cognition eliciting a certain goods movement or attempt to augment  $K_{ij}$  itself. When emotionally laden  $K_{ij}$  is perceived it may suspend calculation and directly cue behavior, though emotion may serve reasoned purposes from a longer run perspective (Frank).

How are resources allocated in this cognitive conception?

1. If social capital is *zero*, there is no cognitive category that elicits a goods movement between  $i$  and  $j$ .

2. If social capital is *positive*, there are certain categories such as family, friend, and neighbors in need that elicit a *transfer of wealth* to  $j$ .

3. If social capital is *negative*, then certain categories such as nasty neighbor, undeserving loafer, or enemy elicit some satisfaction from observing their plight if not actual attempts to *decrease their wealth*.

4. Other people may fall into a category of different, but interesting in which case  $i$  invests in learning about  $j$ 's culture to *alter one's own social capital*.

5. If  $i$  falls into the right cognitive box for  $j$ , the  $\hat{K}_{ij}$  may be a resource for  $i$ . Person  $i$  may invest in altering  $j$ 's cognition of social capital, i.e. *alter other's social capital toward you*.

Other people may have multiple characteristics but  $i$ 's perception is necessarily selective (Samuels). So depending on context (frame) and experience, the same poor person may be seen as deserving or a worthless loafer.

The common element in both models is that the identity of parties to a transaction is expected to make a difference to outcomes. Economists are often interested in testing which of these or other models best describe events. Our interest here however, is in demonstrating the role of social capital through a series of experiments and surveys which are structured in terms of both models.

**Testing for Social Capital**

Much of economics has been built on the assumption that people don't need to care for each other as long as markets organize their selfishness. In this conception, caring and social capital have no role. This seems contrary to experience, but that experience has not impressed many in the profession (Hirshleifer). Therefore we set out to design a set of experiments and surveys to test for the existence of social capital and to explore its impact on productivity and utility. We do not estimate social capital directly, but assume that it decreases as the relationship between parties goes

from family member, friend, stranger, to nasty neighbor, co-worker or whatever.

### The Used Car Experiment

Our first foray into this program of research was to ask if there was any support for the existence of something that might be called social capital or whether only the first category above (zero  $K_{ij}$  social capital) prevailed. One test of the null hypothesis is that identity of trading parties makes no difference to price at which a standard good would trade. We conducted a thought experiment in which the subject was posited to own a used car with a known market value. Then the subjects were asked what price they would sell the car when the identity of the buyer ranged from family member, childhood friend, stranger, to nasty neighbor.

These categories were thought to cover the range from positive, neutral, to negative social capital. The income of these parties relative to the subjects was also varied. Identity did matter, so we inferred that there was some factor present consistent with the theory of social capital (Robison and Schmid, 1991). A less than market price was accepted from those expected to have positive social capital while a premium was demanded from those expected to have negative social capital (no transaction would take place).

Social capital ( $K_{ij}$ ) can explain the favorable price offered by the seller to certain categories of people (eg. a less wealthy childhood friend). On the other side of the transaction, for that friend, this expectation is a stock of social capital ( $\hat{K}_{ij}$ ) which the friend can draw on.  $\hat{K}_{ij}$  eliciting a favorable price is like money (capital) in the bank for the buyer-recipient.

### Catastrophic Risk Experiment

Social capital can be expected to affect behavior in contexts other than market transactions. People have opportunities to affect the welfare of others by accepting or passing on catastrophic risks. A thought experiment was designed to test whether social capital affects behavior which may accept risk and thereby relieve others of danger or refuse

the risk and pass it on to others. Where social capital is zero, we expect the risk to be passed on.

The subject is presented with a situation wherein the boss asks the subject to accept a new assignment which involves a weekly drive of 100 miles. The subject is told that the risk of a fatal accident is .01 percent. Respondents are then asked what percentage increase in their base salary they would require to accept the new assignment. To determine if social capital affects behavior, the respondents are then told that if they do not accept the new assignment, some other person will be required to do it. The identity of the other person is also varied to determine if social capital varies according to identity.

A rational choice model involving the expected utility hypothesis can be used to structure the experiment and interpret the results (Robison). The utility of the  $i$ th respondent may be represented by

$$U_i(\pi_i, K_{ij}, \pi_j). \quad (K_{ii}=1, K_{jj}=0)$$

It is assumed that in the absence of this new assignment that incomes are deterministic. The random variable is represented as  $y < 0$  for all outcomes of  $y$  and the risky states are represented as  $\pi_i + y = \tilde{\pi}_i$ . The survey instrument was intended to measure the percentage increase in own and others wealth required to leave the decision maker indifferent to an alternative. The compensated income with risk is represented as  $(\tilde{\pi}_i + \delta\pi_i)$ . The compensation that the respondents demanded to take the new assignment is a measure of  $\delta$ . The expression of indifference between the original no risk situation and the new risky assignment is  $U_i(\pi_i, K_{ij}, \pi_j) = EU(\tilde{\pi}_i + \delta\pi_i, K_{ij}, \pi_j)$  where  $E$  stands for the expectations operator.

The results with a sample size of 543 are presented in Robison. The mean percentage increase that respondents required to accept the new risk which had no external consequences on others was 11.5. But when the respondents were told that if they refused, others would be required to take the risky task, the amount of compensation required varied with the identity of the other person affected. It was hypothesized that the compensation required by  $i$  would be less if  $j$  were a friend. If  $i$  refuses

and  $j$  is required to drive, this lowers  $i$ 's utility from  $j$ 's welfare if social capital ( $K_{ij}$ ) is positive.

The respondent may be conceptualized as valuing the unchanged risk to  $j$ . If social capital is positive,  $i$ 's utility is increased by sheltering  $j$  from risk which may offset any decrease in own welfare from accepting the risk. Thus it is hypothesized that  $i$  would require less compensation to remain indifferent with the new risky assignment. The results are consistent with this hypothesis. When refusal leaves an uncompensated risk to a *close friend* with assumed positive social capital, the compensation demanded by the mean  $i$  dropped from 11.5% to 8.4%. On the other hand, if the refusal leaves uncompensated risk to a *stranger*, the compensation demanded was 11.7% which is about the same as what was demanded (11.5) when there was no affect on others.

An *unpleasant co-worker* where the social capital is assumed to be negative results in a compensation demand of 13.2 % increase which is greater than that required in the other identity categories. If  $i$  receives some pleasure from a decrease in the unpleasant co-worker's welfare, then  $i$  needs more compensation if she is to accept the added risk to own welfare to be indifferent. Person  $i$ 's utility could increase by refusing and passing the risk to a  $j$  where social capital is negative. So if the risk is accepted, to remain indifferent  $i$  must have more compensation to make up for the welfare that could be obtained by shifting the risk to another. If you find this a bit hard to follow, one can imagine that the respondents did not literally make such a calculation. It is a good argument for a cognitive model which saves on scarce computational power.

Robison also analyzed the data using a tobit analysis to isolate differences due to social capital variables independent of other influences such as age, sex, income, education, driving skills, etc. Space does not permit discussion of the findings except to note that with reference to the base case of the refusal passing the risk to a stranger, the identity shift to close friend decreases the required compensation by 2.64 % which has a 2-tail significance of .00.

## Farmland Leasing Survey

A paradox has existed in the farmland leasing literature for many years. From the conventional production economics view, cash leases should be preferred to share leases because share leases distort the equilibrium between marginal revenue and marginal cost chosen by the tenant. Despite this theoretical inefficiency, share leases are common in the United States. Various explanations have been offered to explain this behavior such as share leases being a means to share risk. None of these have been entirely satisfactory. We offer a social capital explanation of the share lease phenomenon.

If social capital can enter as a multiplier (weight) of items in a consumption function, it can also affect the realized productivity of factors in a production function. The landlord may be able to offer specialized knowledge of the farm, particularly where the landlord was formerly the operator, and thus the productivity of physical inputs ( $X$ ) may be a function of  $K_{ij}$ . There would be no incentive for the landlord to contribute specialized knowledge with a cash lease. The tenant also has opportunities to alter labor intensity, and the productivity of tenant labor ( $L$ ) may be a function of  $K_{ij}$ . The landlord with a share lease may be concerned that the output and shared inputs ( $Z$ ) including land are not reported correctly by the tenant and there may be other opportunistic behavior such as land degradation. Transaction costs ( $T_i$ ) borne by the landlord to prevent this opportunistic behavior may be a function of  $K_{ij}$ .

The profit function for a landlord with a cash rent ( $R$ ) could be written:

$$\pi_i = R - T_i$$

With cash rent, the landlord has no transaction cost except to guard the land quality, but the landlord's skills and resources are not embodied in inputs which produce the rent.

The profit function for a landlord with a share lease percentage of  $S$  and the value of shared inputs ( $vZ$ ) could be written:

$$\pi_j = S\{p[f(X + L + Z)]\} - vZ - T_j$$

$$\text{where } X=X(K_{ij}); L=L(K_{ij});$$

$$Z=Z(K_{ij}); T_j=T_j(\hat{K}_{ij});$$

The value of  $K_{ij}$  would be zero for the landlord with no affinity for the tenant. But where  $K_{ij}$  is positive (landlord cares for tenant), it may increase the services of inputs. Note again that a positive  $K_{ij}$  means that the landlord gets more utility when the tenant gets more income, and that inputs are more productive and farm income is enhanced if the landlord's care is reciprocated. The above model does not attempt to fully separate these effects. A positive  $\hat{K}_{ij}$  reduces transaction costs of monitoring tenant behavior reflecting that the tenant cares for the landlord. Similar functions could be written for the tenant's profit function where inputs by the landlord are a function of social capital. We are not able to estimate profit directly as a function of lease type, but we can infer ordinal ranking from the actual choice of lease type.

In a survey conducted by Kent Gwilliam, both landlords and tenants were asked to describe their relationship with each other at the time the contract was made--ranging from very close friend or family, friendly acquaintance, stranger, familiar business, agency or institution, to unfamiliar firm or agency (declining  $K_{ij}$ ). A logit model was used to test how these representations of social capital and other variables affected the probability that the landlord would choose a share lease (sample size 75). The identity of the tenant was statistically significant (.03) in the hypothesized direction (more  $K_{ij}$  social capital, greater probability of choosing share lease). Also included in the model were measures of the character of socializing between the parties such as member of same church, joint leisure activity, or no social interaction. This social interaction variable was also significant. Attitude toward risk was also significant (.06).

The results for the tenants ( $j$ ) contrasted to those for landlords. Tenant caring for landlords, i.e. the identity of the landlord (social capital  $K_{ij}$ ) did not affect the probability that the tenant would choose a share lease (significance of .18 and sample size 121). But, the following expressions of social capital ( $\hat{K}_{ij}$ ) from the landlord were significant:

opportunity for joint decision making by both landlord and tenant, tenant's perception of the willingness of landlord to help, and of landlord's knowledge of farming. From the tenant's perspective, these resources from the landlord are expressions of social capital,  $\hat{K}_{ij}$ . The landlord's ( $i$ ) attitude toward the tenant ( $j$ ) is a capital resource for the tenant. When these resources were available, it increased the probability of a tenant choosing a share lease.

### Loan Approval Study

The above study presented evidence that social capital could be a productive input, saving costs otherwise spent or multiplying the productivity of inputs. The cost saving aspect is further investigated in a study of farm loan approvals by banks. Information about the borrower's ability to repay the loan is often costly to obtain and if social capital could improve the bank's information, it would be valuable.

Siles, Hanson, and Robison surveyed 103 small town bankers. When asked directly, the bankers gave little importance to the role of social relationships in approving loans. They reported giving great weight to profitability, liquidity, solvency, repayment capacity, managerial capability, etc. To inquire more deeply, the bankers were given a set of hypothetical loan applications for \$50,000 where the traditional financial data was varied in 72 different combinations (any one banker was given only 18 combinations). In addition to the usual financial data on liquidity, profitability and managerial capability, one of the applicant characteristics is specified as a positive or negative social relationship ( $K_{ij}$ ). In thinking about the meaning of the social relationship, the respondent is directed to a list of factors including members of same club, attended school together, honesty, involved in the community, etc. Another characteristic of the applicant referred to a good or poor business relationship defined in such terms as number of accounts with the bank, frequency of transactions, size of account, etc.

A logistic function was estimated to test the effect of liquidity, profitability, managerial capability and social and business relationships on the likelihood of loan approval. The coefficients for

low social and low business relationship are negative while high social and high business relationships are positive. The effects of relationships are largest where the information on the business strength of the firm is mixed. While bankers don't like to admit to the role of social relations in loan approval, they appear to utilize the information in practice.

If you have an outstanding financial record you get the loan regardless of who you are. But if you are marginal, social capital makes a difference. Two interpretations are possible: One, the loan is made as an expression of existing social capital or to create more of it for future use. Two, social capital substitutes for information and contributes to the profitability of the bank. Further research is needed to understand these interacting roles for social capital.

### Bank Customer Retention Study

Social capital theory suggests that business may find it profitable to invest in altering how customer  $j$  feel about the business ( $\hat{K}_{ij}$ ). The bank hopes that expressions of  $K_{ij}$  create  $\hat{K}_{ij}$ . A survey of 103 bank executives by Siles, Robison and Hanson (1993) indicated that the goal of bank advertizing was equally to let people know about bank services and to let people know that the bank cares about them and that the bank supports community-organized events. The latter is interpreted as an investment in social capital ( $\hat{K}_{ij}$ ) from the bank's point of view. Sixty percent of the respondents reported that the involvement of bank personnel in social activities and community-related programs was very important. Seventy-eight percent of the bankers reported that they very often patronize social, cultural and other activities aimed at improving the bank's image and reputation within the community.

What is the economics of this social capital investment by banks? A survey of 409 bank customers was conducted by Siles, Robison and Hanson (1994) to determine if social capital affected customer behavior. A logistic model was used to estimate the effects of different customer characteristics, including the relationship with the bank, on the likelihood of continuing to do business

with their primary bank. Respondents were asked to indicate whether continued business was unlikely or highly probable, and whether their relationship with the bank was perceived as close and warm, indifferent or neutral, or unfriendly. The relationship did affect the likelihood of the customer staying with the bank. Educational levels, population and distance did not affect the likelihood, but number of years in the community did.

The return to investment in social capital by the bank can be further quantified by asking the customers to engage in a thought experiment which involves a tradeoff between interest rates and social capital. Customers were asked to assume that they had a \$1,000 certificate of deposit (CD) coming due and a new branch of a national bank had just opened near by. They were asked to indicate the minimum interest rate that they would be willing to accept to purchase a certificate of deposit from the new branch. This is the product price differential needed to switch. In this question, the customer is assumed to consider (or ignore) whatever factors are now operative in consumer choice. Next the customer is asked for the minimum interest rate to switch assuming that the relationship with the bank is unfriendly, indifferent, or close and warm.

The minimum interest rate required to switch banks differed according to the social capital. "Friendly relationships increase by .74 percent the CD rate required by customers of friendly financial institutions to switch compared to the CD rate offered customers of unfriendly financial institutions."

### Conclusions

Social capital is a productive asset. The identity of the parties to a market transaction does affect price. This is indicated by findings from the study of a used car sale and by the interest rate at which customers would switch savings from one bank to another. Social capital affects the acceptance or transference of catastrophic risk. Social capital affects the choice of farmland leasing contract with the potential to save transaction costs and multiply the productivity of inputs and to increase profit. Social capital affects the probability of loan approval with the potential of saving information costs and increasing returns to lenders.



Business firms do invest in social capital held by their customers and there is evidence that customers respond by requiring higher interest differentials to switch to another source. Social capital is like money in the bank, makes assets more productive, and saves costs--besides being valuable in itself.

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