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# THE ECONOMIC APPROACH TO SOCIAL CAPITAL

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**ABSTRACT**

To identify the determinants of social capital formation, it is necessary to understand the social capital investment decision of individuals. Individual social capital should then be aggregated to measure the social capital of a community. This paper assembles the evidence that supports the individual-based model of social capital formation, including seven facts: (1) the relationship between social capital and age is first increasing and then decreasing, (2) social capital declines with expected mobility, (3) social capital investment is higher in occupations with greater returns to social skills, (4) social capital is higher among homeowners, (5) social connections fall sharply with physical distance, (6) people who invest in human capital also invest in social capital, and (7) social capital appears to have interpersonal complementarities.

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## I. Introduction

A growing body of research documents significant correlations between "social capital" variables, such as membership in organizations, and important economic outcomes.[1] Putnam (1993) jump-started the research on social capital when he found a strong correlation between measures of civic engagement and government quality across regions in Italy. Many authors have contributed to this literature. For example, Knack and Keefer (1997) find that a one-standard deviation increase in a survey-based measure of country-level trust increases economic growth by more than one-half of a standard deviation. LaPorta, Lopez-de-Silanes, Shleifer and Vishny (1997) find that across countries, a one-standard deviation increase in the same measure of trust increases judicial efficiency by 0.7 of a standard deviation and reduces government corruption by 0.3 of a standard deviation. Goldin and Katz (1999) argue that social capital in the American Midwest facilitated the rise of the high school.

This empirical research on the effects of social capital has a clear theoretical basis. Economists understand the role that repeated social interaction plays in solving free rider problems and reducing opportunism (e.g., Greif 1993). The literature on repeated games (Abreu 1988, Fudenberg and Maskin 1986, Kreps et al 1982) explains why cooperation becomes easier when individuals expect to interact more often in the future. Social

[1] Section 3 discusses the relative merits of these two measures of social capital (i.e., membership in organizations and survey measures of trust).

connection can substitute for missing, or expensive, legal structures in facilitating investment and other financial transactions (Arrow, 1972).

But while we have theory and evidence on the *effects* of social capital, we are just beginning to identify the underlying mechanisms that *create* social capital in the first place. Our leading source of knowledge is Putnam's (2000) exhaustive empirical survey of the potential causes of an ongoing decline in social capital in the U.S.

Theoretical work on the underlying mechanisms that create social capital has also begun. But, there does not yet exist a commonly accepted theoretical framework within economics for thinking about the determinants of investment in social capital.[2] We believe that this lack of consensus exists because economists have by and large adopted pre-existing social capital frameworks that are based on aggregate analyses. Putnam, for example, defines social capital as networks. Indeed, the post-Coleman (1990) literature has almost universally viewed social capital as a community-level attribute. Because economists find it difficult to think of communities as decision-makers, aggregate definitions may serve as barriers to the development of an economic framework for modeling the causes of investment in social capital.

In this paper we analyze the formation of social capital using a model of optimal individual investment decisions. Our approach contrasts with group-based analyses, which emphasize institutions, norms, conventions, and aggregate/group outcomes rather

than the decisions of individual actors.[3] For convenience, we will call our optimization-based analysis of individuals an "economic approach," but we note that economics is not the only social science to utilize these principles.[4]

In our analysis, we define individual social capital as a person's social characteristics — including social skills, charisma, and the size of his Rolodex — which enables him to reap market and non-market returns from interactions with others. As such, individual social capital might be seen as the social component of human capital.[5] We assume that individual social capital includes both intrinsic abilities (e.g., being extroverted and charismatic) and the results of social capital investments (e.g., a large Rolodex). We lump these forms of social capital together because they are practically indistinguishable. For example, it is hard to know whether an attribute like popularity is an innate ability or something that the individual has worked to develop.

We sometimes divide individual social capital into different externality-based subcategories. For example, individual membership in a network tends to generate a positive externality while individual status may generate a negative externality (when

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[2] DiPasquale and Glaeser (1999) and Alesina and LaFerrara (2000) both provide models of social capital investment. However, these models tend to focus on quite specific aspects of this investment (homeownership and ethnic heterogeneity respectively).

[3] Group-based approaches sometimes use optimization as an organizing principle, but optimization tends to be more commonly used in the individual-based approach. Indeed, optimization and individual-based analysis are sometimes treated as synonyms within the social science literature. For one example of research that drives a wedge between these concepts, consider models from the behavioral economics literature. These models are individual-based but often assume that behavior is sub-optimal (or quasi-rational, Thaler 1991).

[4] Economists have simply adopted these organizing principles more frequently than researchers in other fields.

[5] Bowles and Gintis (1998) also argue that social skills are an important subcomponent of individual human capital. Bowles and Gintis argue that schooling plays a central role in developing such skills.

status is a zero sum game). Aggregate social capital is a function of these many different types of individual social capital.

In theory, aggregate social capital incorporates all of the cross-person externalities generated by the different types of individual social capital. Hence, aggregate social capital measures social characteristics that yield market and non-market returns to a society. Our definition of aggregate social capital is thus quite close to the usual definitions of social capital. Unfortunately, the path from individual to aggregate social capital is difficult, because of the extraordinary importance of social capital externalities. The complexity of aggregation means that the determinants of social capital at the individual level may not always determine social capital at the society-level. For example, consider a stereotypical used car salesman who has lots of individual social capital (i.e., he's good at selling lemons to naive customers), but who generates little net social capital because of his negative social capital externalities.

This paper attempts two tasks. First, we describe the economic approach to investment in social capital. Essentially, our framework adapts the traditional models of investment in human and physical capital. Second, we present some basic evidence testing the implications of this framework. Little of our evidence is conclusive and much of it is already known. Our contribution comes from linking the evidence with a simple economic model of social capital investment.

Empirically, we first show that only a small share of the observed social capital heterogeneity can be explained by group-level variables. For example, including 49 state dummies explains only 1.4 percent of the variation in the number of organization memberships across individuals. Even with 1075 group dummies constructed by interacting metropolitan areas and religious groups we explain only 10.6 percent of the variation in organization membership. This evidence suggests that observable group identifiers are unlikely to explain most of the variation in social capital, motivating our individual-based economic approach.

The economic approach makes numerous predictions that are almost all born out by the data. First, lifecycle effects predict that social capital rises and then declines with age, just like other forms of capital. Second, mobility drives down social capital returns and hence social capital investment. Third, individuals who work in occupations for which social skills are relatively important accumulate more social capital. Fourth, homeownership reduces mobility and therefore raises investment in neighborhood-specific social capital (see DiPasquale and Glaeser, 1999). Fourth, physical distance and travel costs reduce social connection (see Glaeser and Sacerdote 1999, and Putnam 2000). Fifth, variation in patience across individuals generates a reduced form correlation between social capital accumulation and investment in other forms of capital, including education (which is the subject of Nie et al. 1996, and Helliwell and Putnam 1999). Sixth, social capital complementarities predict that social capital covaries strongly within peer groups.

One prediction of the economic model does not do as well empirically. Specifically, individuals with a high value of time (i.e., high wage) are predicted to accumulate less social capital. We discuss several reasons for this failure of the model, including the possibility that social skills are necessary for success or are complements to other forms of human capital.

On the whole, we think that the economic approach to social capital does well empirically. The economic model of investment provides, as it did with physical and human capital, a logical framework to understand the relative sizes of capital stocks. As economists begin to explore the domain of social capital it makes sense to keep our feet planted firmly on the basic model which has been so effective in understanding other forms of capital.

## II. The Economic Approach to Social Capital

In this section, we present a simple model of investment in social capital. This model is almost identical to the standard models of investment in physical and human capital. However, our treatment of social capital as an individual characteristic sharply differentiates us from the bulk of the modern literature on social capital, which treats social capital as the characteristic of a community. Our treatment of social capital as an individual characteristic does, however, have many precedents. For example, in 1904, Henry James uses the term social capital to refer to the social resources of a female

character in *The Golden Bowl*. Loury (1977) also views social capital as an individual characteristic (the set of social resources that aid in the accumulation of human capital).

Given our individual approach to social capital, we start with a simple investment problem. Individual social capital is represented as a stock variable, $S$, and aggregate per-capita social capital is represented as a stock variable $\hat{S}$. Each individual receives a per-period utility flow of $S * R(\hat{S})$, where $R(\hat{S})$ is a differentiable function with aggregate per-capita social capital as its argument.

The flow payoff $S * R(\hat{S})$ reflects both market returns and non-market returns. Market returns may include higher wages or better employment prospects for socially competent persons. Non-market returns may include improvements in the community, or health, or even direct happiness. The literature on social capital strongly argues that there are positive complementarities in investment in social capital across individuals; nothing is gained by going alone to the Church social, which leads us to think that $R'(\hat{S}) > 0$.

The social capital stock follows the dynamic budget constraint, $S_{t+1} = \delta S_t + I_t$, where $S_t$ represents the stock of social capital that has been accumulated and $\delta$ is the depreciation factor.[6] Hence, $1-\delta$ is the depreciation rate. The level of investment, $I_t$, has a time cost $C(I_t)$, where C(.) is increasing and convex. The opportunity cost of time is $w$,

[6] A more general model would include time-dependency of the depreciation rate of social capital, reflecting the effects of changes in the mortality rates of the other members of one's social network and changes in one's own physical and mental ability. An increasing depreciation rate would sharpen our predicted decrease in social capital investment in late life.

representing the wage rate or the value of leisure time if labor supply is inelastic.[7] We assume that individuals have a known lifespan of T periods and that they discount the future with discount factor β. We also assume that with probability θ the individual stays in his community. When people move, the value of their social capital discretely depreciates, falling by factor $\lambda$. This decline is meant to capture the idea that much of social capital investment is community specific. Let $\phi = \theta + (1-\theta)\lambda$. Hence, $\phi$ represents the depreciation factor arising from mobility.

The individual's maximization problem can now be expressed as:

$$\max_{I_0, I_1, \ldots, I_T} \sum_{t=0}^{T} \beta^t \left[ S_t * R(\hat{S}_t) - wC(I_t) \right],$$

$$\text{s.t. } S_{t+1} = \delta\phi S_t + I_t, \ \forall t .$$

The equation that describes the evolution of the capital stock incorporates the expected depreciation that arises from mobility. The individual maximizes his objective function, taking aggregate per-capita social capital, $\hat{S}$, as fixed.

The first-order condition associated with this investment problem is given by:

$$(1) \ wC'(I_t) = \frac{1-(\beta\delta\phi)^{T-t+1}}{1-\beta\delta\phi} R(\hat{S})$$

[7] In a more general model, $C(I_t)$ and $w_t$ would depend on $S_t$, but we simplify our analysis by excluding these dependencies. Including these dependencies would not change our comparative statics results.

This first order condition implies the following comparative static results. Social capital investment (1) rises with the discount factor, $\beta$, (2) declines with mobility, $\phi$, (3) declines with the opportunity cost of time, $w$, (4) increases with the occupational returns to social skills, $R(\bullet)$, (5) declines with the rate of depreciation, $(1-\delta)$, (6) rises in communities with more aggregate social capital, $\hat{S}$, (7) rises when social capital is less community specific, $\phi$, and (8) declines with age, $t$. These are not surprising results, and most would hold for any capital stock.

Because the stock of social capital is a function of the flow, all but one of these comparative statics hold for the stock of social capital as well as the investment flow into social capital. The only exception is age, assuming that an individual's social capital endowment is sufficiently low at birth. At the beginning of the lifecycle the individual will engage in social capital accumulation, but towards the end of life the benefits from investment go to zero and will not justify the costs (if costs are positive). Hence, late in life investment will not offset depreciation.[8] Thus, we would expect a social capital profile with a midlife peak.[9]

Two special properties of social capital stand out. First, social capital tends to be highly community specific. As such, residential mobility should be a key determinant of investment in social capital. There is, of course, a strong parallel with Becker's (1964) focus on firm-specific human capital, which sharply depreciates when individuals leave their current job. Likewise, social capital sharply depreciates when individuals leave

[8] Moreover, if investment is not bounded at zero, the individual may choose negative gross investment.

their community. Naturally, in a more complete model the mobility decision would itself be endogenous and would be predicted to decline as individuals accumulate community-specific social capital.

Second, social capital is thought to have strong interpersonal complementarities. This may be true for both physical and human capital, but nowhere should the presumption of positive complementarities across people be stronger than in the case of social capital.

These complementarities suggest that there may be large social multipliers. In other words, the effects of the change in a parameter for an individual may be much smaller than the effect of the change in the same parameter for the aggregate. This is particularly important in trying to understand the massive changes in the levels of social capital over time. These aggregate multiplier effects will be difficult to measure using cross-sectional analysis, since the aggregate level of social capital is by definition held constant when cross-sectional variation is used to identify empirical effects.

To make these points more concretely, we modify (1), so that T is infinite, and examine steady state levels of social capital. In the steady state I=(1-δ)S, implying that for an individual change in wages (holding community levels of social capital constant):

$$\frac{\partial S}{\partial w} = -\frac{C'((1-\delta)S)}{(1-\delta)wC''((1-\delta)S)} \quad .$$

[9] This result also depends on our assumption that the function $R(\hat{S})$ does not vary over the lifecycle.

For an aggregate change in wages, we can think about the case of a homogenous community where $S = \hat{S}$. In this case:

$$(2) \qquad \frac{\partial \hat{S}}{\partial w} = -\frac{C'((1-\delta)S)}{(1-\delta)wC''((1-\delta)S) - R'(\hat{S})/(1-\beta\delta\phi)} = \frac{1}{1-\frac{\partial S}{\partial \hat{S}}}\frac{\partial S}{\partial w},$$

where $\frac{1}{1-\frac{\partial S}{\partial \hat{S}}}$ is the social multiplier. When increases in aggregate social capital strongly increase individual investment in social capital, then it is likely that the aggregate elasticity of social capital with respect to any parameter (in this case the opportunity cost of time) will be much higher than the micro-elasticity of social capital with respect to the same variable. This naturally makes us cautious about using methodologies where we multiply a micro-elasticity estimate by the change in the aggregate level of the variable to predict changes in the time pattern of aggregate social capital.

These complementarities raise the possibility that there exist multiple equilibria in the levels of social capital investment. In some communities, the level of investment is high and the return to investment is consequently high. In other communities, no one invests and the return to investment is low. The literature on social capital often emphasizes the importance of historical conditions in determining the level of social capital in a community (e.g. Putnam, 1993). Multiple equilibria models explain how small differences in initial conditions can generate large divergence in long-run levels of social capital.

*The Aggregation Process*

Micro-level analysis of social capital investment provides a new application of standard economic theory. In Section III, we will empirically test these implications. Before proceeding to the empirics, we first discuss the connection between individual social capital and the more widely studied concept of aggregate social capital.

We define aggregate social capital as the average of individual social capitals, adjusting for all of the relevant externalities. We believe that the size and sign of these externalities vary dramatically across different categories of individual social capital. While a full understanding of these heterogeneous externalities is far beyond the scope of this essay, we now briefly discuss two broad classes of social capital investment and their connection to aggregation.

Joining a social network may be one of the most common forms of social capital investment. These networks could be specific organizations, such as bowling leagues, or broad classes of individuals with a common social characteristic, such as the ability to speak French. Both enrolling in bowling clubs and learning to speak French diminish social distance between the individual and some social group. This leads to information flows, which usually serve both the investor and the other members of the network. Diminished social distance also creates trust, loyalty, altruism, and cooperation. It is hard to know whether these social behaviors are preference-based or incentive-based, but often

the distinction does not matter. Whether members of a social network like each other or view themselves as playing a repeated game, their social network creates cooperative, socially efficient outcomes. For example, networks have the ability to punish and reward their members. At the very least, ostracism creates one sort of punishment.[10] The existence of this ability to punish will make it possible for the network to elicit good behavior from its members.

Network membership often has strong positive externalities. The entire network benefits from each new membership, so the aggregate social capital (at least at the network level) will exceed the naïve sum of individual investments (see, e.g. Lazear, 1999). Of course, if the network is itself undertaking activities which hurt other people (think of the old Teamsters' union), there may be positive externalities within the network but negative externalities toward society as a whole. In this case, the level of aggregation becomes critical.

Joining networks is only one of many important forms of social capital investment. We believe that the accumulation of status or influence should also be seen as a form of social capital. Status might be seen as a measure of social influence that enables its possessors to reward and punish others. Glaeser et al. (2000) finds evidence suggesting that status variables appear to be strong forms of individual social capital in the sense that they enable some people to extract larger rents from a voluntary non-market transactions. Ball et al. (2000) shows that this is true when status is assigned exogenously and the transaction is market-based.

[10] This works for a bowling club but not learning French.

Individuals accumulate status in many ways: e.g., displaying material wealth, flaunting visual attractiveness, or demonstrating athletic prowess. If status is a relative measure, one person's accumulation necessarily decreases the status of others. Being the most popular kid on the schoolyard brings special rewards, and two people can't simultaneously hold that title. Increases in individual status may not raise community levels of social capital.

Networks and status are only two of the many forms of social capital. However, they illustrate some important aggregation issues that will repeatedly arise in the analysis of social capital investment. Understanding the link between individual and aggregate social capital is important, difficult, and best left to future research.

## III. Evidence

The empirical work on social capital has focused on two types of evidence. First, researchers use a survey question about trust that asks: "Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?" Combining survey evidence with laboratory experiments, Glaeser et al. (2000) have raised significant questions about the reliability of this survey measure. Subjects who report that they are trusting, do not act more trusting in a standard trust game.[11] Furthermore, even if this widely studied survey question does capture trust, it is not

obvious that individual trust and individual social capital are conceptually the same. Individuals who are more trusting may or may not be able to extract surplus from social interactions. If trust is not repaid, then being more trusting will be individually counterproductive. It is much more natural to think of a link between aggregate trust or trustworthiness and aggregate social capital. Individual trust may not benefit the trustor, but it almost always benefits the trustee. Hence, we do not feel comfortable using the trust question as a measure of *individual* social capital.

The second empirical approach to social capital emphasizes evidence on organization membership. Putnam (2000) presents the most complete analysis of this evidence. For our empirical work, we use responses to organization membership questions from the General Social Survey (or GSS). In the U.S., The General Social Survey is a repeated annual cross-section of 1,200 to 2,500 respondents. We use data from 1972 to 1998.

The GSS does not actually record the number of memberships per respondent, but rather the number of *types* of organizations to which a respondent belongs. Thus an individual who is a member of a religious organization and a veteran's organization would have a membership value of two. A person who is a member of three fraternal organizations has a value of one. This counting scheme is both undesirable and unavoidable.

The mean membership value is 1.78 and the standard deviation is 1.89. Fifty-five percent of the GSS respondents report a membership value of either zero or one, and 95 percent

[11] However, individuals that say they are more *trusting*, do behave in a more *trustworthy* manner. Hence, aggregate tabulations of this survey question may successfully measure social capital at the community

report a value less than or equal to five. The maximal value is 16. Appendix table one reports the full distribution of responses.

It is not obvious if organization membership reflects the stock of an individual's social capital (S) or the level of investment (I). We tend to think of organization membership as a stock variable, since it is often much harder to join an organization than to maintain ongoing membership (e.g., joining a fraternity requires social lobbying and initiation rites). In most cases, the stock-flow distinction is immaterial since the comparative statics for the stock of capital and the flow of investment are identical. The comparative statics only differ when age is varied. We discuss the interpretation of organization membership when we get to that analysis.

*a. Individuals and Groups*

Before proceeding with the implications of the economic approach, we first address the relative importance of individual and group level variation. Since most of the thinking about variation in social capital has focused on states, regions and countries, it seems to be worth asking how much of the individual variation in social capital levels is driven by the large geographic (and religious) social groups of which one is a member.

In Table 1, we report the relationship between group dummies and variation in organization membership. In each specification, we include a different set of dummy variables and report the associated R-squared statistic. For example, in the first

level.

regression we include 49 state dummies. These state dummies explain 1.4 percent of the variation in the dependent variable, so 98.6 percent of the variation in organization membership across individuals is *not* related to cross-state differences. The second regression uses Primary Sampling Unit (PSU) dummy variables. Primary sampling units are metropolitan areas for urban respondents and multi-county agglomerations for non-urban respondents. This set of 284 dummy variables explains 3.9 percent of the individual variation in social capital. Clearly, variation in individual social capital levels is not well-explained by state or city of residence.

Perhaps individual social capital differences are really explained by membership in specialized social groups, which are only weakly associated with geographic regions like states or cities. To explore this possibility the third regression includes dummies for denomination membership. On their own these dummies explain little, yielding an R-squared of 2.3 percent.

In regression (4), we allow 479 dummy variables including the interaction of the 49 states and 11 religious denominations. In this case, we treat a state—religion group as a separate social cluster and find that all of these dummies only explain 6.1 percent of the variation across people in organization membership. In regression (5), we use state by religion by race dummy variables and find that the R-squared rises to 8 percent.

Finally, in the last regression we interact the PSU and religion variables (e.g. Presbyterians in Phoenix would be represented with their own dummy variable). To

avoid overfitting, we eliminate groups with fewer than five members. In this case, we have 1075 dummy variables, yielding an R-squared statistic of 10.6 percent.[12] Hence, after adding more than 1000 (admittedly coarse) geographic and religious dummy variables, almost 90 percent of individual variation remains unexplained.

Perhaps better measurement of geographic neighborhoods would dramatically improve these results. However, we believe that individual variation in social capital investment is quite large and often difficult to associate with geographic neighborhood effects. We view the low R-squared statistics in Table 1 as weak evidence for the value of an individual-oriented approach to social capital investment.

*b. Social Capital and the Lifecycle*

In this section we begin testing the implications of the economic model of individual investment in social capital. If we take organization membership as a proxy for the stock of social capital, then the model predicts an inverted u-shaped profile of social capital over the lifecycle. Figure 1 plots the empirical relationship between age and organization membership, combining data from all of the GSS cross-sections (1972-1998). Putnam (2000) shows a strikingly similar figure, and this age relationship is well known in the social capital literature. The inverted u-shape is striking and is predicted by the model.

[12] If we do not eliminate any groups, we have 2227 dummy variables, yielding an R-squared statistic of 16.7 percent.

Table 2 evaluates these life-cycle effects controlling for several demographic variables, including birth year. The age effects continue to be large and statistically significant. As Table 2, regression 1 shows, individuals between 40 and 49 years of age belong to .48 more organizations than individuals over 60, and belong to .20 more organizations than people in their 20's.[13]

These age estimates do not change when we add other right-hand-side variables. For example, we include linear cohort effects (regression 1), linear year effects (regression 2), cohort dummies (not reported), and year dummies (not reported). In all cases, the time effects were roughly the same.[14]

In addition, the decline for older adults does not depend on health effects. If we look only at persons who claim to be in good health, the decline still persists. Furthermore, it is hard to imagine that health could explain the decline before age 60.

We include education as a control variable in regressions 3-6. This additional control variable reduces the magnitude of the age effects, but does not change the broad pattern of age effects. Including education dramatically raises the R-squared statistic. Without education, the R-squared value hovers around .05, but with education the value rises to approximately .15.

[13] The negative coefficient on the female gender dummy does *not* represent a child-rearing effect. The estimated female effect does not change when we include an interaction term that multiplies the female dummy with the number of children in the household.

If the reader prefers to view organization membership as a proxy for the flow of social capital investment rather than the stock of social capital, then the rise in membership between 18 and 40 contradicts the predictions of the model. However, the high mobility rates of the young and their greater tendency to be single without children explain a significant fraction of the relatively low rates of group membership among the young.

*c. Social Capital and Mobility*

Because social capital depreciates when an individual leaves his neighborhood, the model predicts a negative relationship between expected mobility and social capital investment. To evaluate this implication, we first create an expected mobility measure. We do not have an exogenous variable that affects only predicted mobility and has no other plausible effects on social capital. So we use age, marital status and family status to create a predicted mobility variable. We form an indicator variable that measures whether a respondent has moved in the past year.[15] We regress this indicator variable on age, marital status and family status.

Figure 2 shows a plot of organization membership on expected mobility. We find a statistically strong relationship (t-statistic over seven) that is also quantitatively meaningful. It is certainly possible that this relationship is due to other connections

[14]Due to the linear dependency between age, birth-year, and time, we can not control simultaneously for cohort (birth-year) effects and time effects.

[15] Naturally, probability of a prospective move would be a preferable LHS variable, but this variable is not available.

between age, marital status and social capital. Nevertheless, Figure 2 unquestionably shows that another prediction of the model is consistent with the data.

d. *Social Capital and the Returns to Social Skills*

The economic model also predicts that higher returns to social capital will induce higher rates of investment.[16] While we do not directly observe individual differences in the returns to social capital, we do have information on individual occupations and the sociability of occupations. We test the hypothesis that individuals in relatively social occupations acquire more social capital. This hypothesis is motivated by the assumption that individuals in social occupations have more to gain by acquiring social capital.

To measure occupational sociability we use a GSS survey question that was included only on the 1970 survey: "How important do you personally consider [the following] job characteristics?" We focus on the listed job characteristic that describes sociability: "A lot of contact with other people." Survey responses range from one to seven. Using the 1970 responses, we created a ranking of occupations by "sociability." Table 3A gives the top and bottom five occupations by sociability. The least sociable occupations (e.g., textile operatives, billing clerks) appear to require little social capital, and hence offer low returns to social capital investment. The most sociable occupations (e.g., physicans, clergymen) require a great deal of social capital and offer high returns to social capital investment.

Table 3B divides the occupations by average sociability and lists average organization membership for these different subgroups. Individuals in more sociable occupations invest much more in social capital. In the fourth regression of Table 2, we regress an individual's organization membership on the average sociability of his occupation. Raising the sociability of one's occupation from 2 to 6 raises organization membership by 29 percent.

Omitted variables may drive these observed correlations. Suppose that the cost of sociability varies across individuals. Some people have a hard time making new friends, while others do so effortlessly. Individuals with low sociability costs should endogenously select occupations with high levels of sociability and should invest in social capital/networks. This additional economic story predicts the observed correlation between occupational sociability and social capital investment. If sociability costs are at least partly inherited, then this economic story also explains the observed correlation between parental occupation and the social capital accumulation of offspring.

*e. Social Capital and Homeownership*

Social capital also correlates strongly with homeownership. Because of high transaction costs in the real estate market, homeowners tend to be relatively less mobile, and low levels of mobility predict high levels of social capital. Homeownership also creates

[16] Of course, substitution and income effects go in opposite directions. But, substitution effects are likely to dominate if there exist other investment vehicles (i.e., stocks, bonds, physical capital, and other forms of

incentives to invest in the particular forms of social capital that are complementary to residential capital, like neighborhood watch organizations or civic associations. Thus, homeownership generally raises social capital investment, and is predicted to particularly encourage social capital investment that increases the value of local property values.

DiPasquale and Glaeser (1999) investigate the relationship between homeownership and social capital. They find significant connections between homeownership and a rich variety of social capital and citizenship variables. The homeownership—social capital connection survives individual fixed effects estimation: DiPasquale and Glaeser compare the same person over time as they switch from being renters to owners and back. They find that about one-half of the connection between homeownership and social capital comes from the reduced mobility effects associated with homeownership.

In Table 4, we document the strength of the connection between homeownership and social capital. We show the coefficient on homeownership for the full set of organization types. In each of the individual organization regressions, we report marginal coefficients from a probit regression evaluated at sample means. We control for a rich set of other demographic characteristics in these regressions. In every case except for veterans' groups the coefficient on homeownership is positive.

By looking at all of these coefficients, we can determine if homeownership plays a particularly important role in predicting membership in organizations that complement residential capital. The evidence seems mixed. The political group coefficient is not

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human capital etc...).

large, but the school service coefficient is the largest among all of the organization types. While the connection between home ownership and social capital is quite robust, it is not obvious that this connection holds particularly strongly among those forms of social capital that seem likeliest to raise property values. The homeownership effect works most strongly through its negative effects on expected mobility.

*f. Social Capital and the Opportunity Cost of Time*

The economic model also predicts that investment in social capital should decline as the opportunity cost of time rises. This prediction is not supported by the data. The relationship between income (or education) and social capital investment is uniformly positive (see Table 2). This might not be surprising, if one imagines that the same people who invest in standard forms of human capital (e.g. college educations) also invest in social capital. Human capital and social capital may be complements. Likewise, relatively patient individuals may invest in all forms of capital. These confounding mechanisms make it nearly impossible to examine the relationship between social capital and the opportunity cost of time.

Two pieces of evidence (both in Putnam 2000), however, support the economic predictions about time-scarcity effects. First, non-working wives invest more in social capital than working women. Second, Putnam (2000) argues that exogenous increases in the availability of television appear to decrease social capital investment. The availability

of television raises the opportunity cost of socializing. These two facts weakly support the view that investment in social capital is driven in part by the opportunity cost of time.

*g. Social Capital and Spatial Proximity*

Spatial proximity influences the cost of social capital investment. Glaeser and Sacerdote (1999) investigate the relationship between spatial proximity and social connections, and find that residents of big cities and individuals who live in apartment buildings are more likely to socialize with their neighbors. They are also more likely to go out to dinner. This seems to point to the importance of physical distances in driving social connection. Putnam (2000) provides evidence that urban sprawl is associated with less social capital formation, presumably because of the time cost of traveling long distances.

The most convincing evidence on the role of distance in driving social connection comes from sociology. The masterpiece of this literature is the study by Festinger et al. (1950). These researchers examine a situation where individuals have been randomly assigned living units in different buildings. Festinger et al find that people who are spatially far apart are less likely to form social connections. This unsurprising result provides the clearest evidence for the important role that physical distance plays in deterring social connection.

h. *Social Capital and Human Capital*

The economic model predicts that the rate of time preference will determine investment in both human and social capital. Relatively patient individuals will accumulate high levels of human capital. Barsky et al. (1997) document a strong empirical connection between experimentally measured patience and human capital. Similar relationships should link patience and social capital. These relationships predict a reduced form correlation between human capital and social capital. Table 4 documents such a positive correlation between education and membership in organizations.

This positive relationship is well-known in the social capital literature (see e.g. Helliwell and Putnam 1999). There are many interpretations of this evidence. For example, Nie et al. (1996) claim that relative status drives social engagement, and that education is a proxy for relative status. However, Helliwell and Putnam (1999) argue against this interpretation, pointing out that peer education *increases* social capital, holding individual education constant. Other explanations for the social capital—human capital connection include the possibility that we learn social skills in school, or that individuals with high levels of human capital (e.g., good language and communication skills) simply get relatively high levels of utility out of social interaction. The connection between social capital and human capital is one of the most robust empirical regularities in the social capital literature. Better understanding this connection should be a key goal for future research.

*i. Social Capital and Interpersonal Complementarities*

As we stressed earlier, a key difference between social capital and other forms of capital is that social capital generates relatively strong interpersonal complementarities in investment. People who belong to groups with more social capital will tend to invest more in social capital themselves. To test for this possibility, we use the group categories defined earlier—PSU interacted with religious denomination. In this case, we use religious denomination at age 14 rather than current religious denomination to avoid some of the endogeneity problems that would arise if denomination were endogenously chosen. We then form the average organization membership in one's social group (i.e. PSU by denomination cell). Naturally, we exclude the individual himself when calculating the average for his peer group.

In Table 2, regression 5, we show the relationship between individual social capital and the social capital in one's peer group. The relationship is quite strong—we estimate a coefficient of .13. There are several, well known, problems with this type of estimation (the reflection problem, omitted variables that create a spurious correlation between individual outcomes and peer group outcomes). Under the assumption that the background characteristics of individuals in one's peer group do not have a direct impact on one's social capital investment it is possible to use these background characteristics as instruments for social capital in one's peer group.

In Table 2, regression 6, we use the education, age, marital status, and income of members of each person's peer group as instruments for the social capital of the peer group. All peer group averages exclude the individual whose social capital appears on

the left-hand-side of the equation. Using the IV approach, we find that the peer group effect vanishes. This negative IV finding leads us to be agnostic about the relevance of social capital multipliers. The apparent absence of a social multiplier only reinforces the broad themes of this paper: individual incentives, not group membership, drive social capital accumulation decisions.

## IV. Conclusion

Our analysis shows that social capital accumulation patterns are consistent with the standard economic investment model. Individuals accumulate social capital when the private incentives for such accumulation are high. However, profound differences distinguish social capital from other forms of capital. Most of these differences stem from the interpersonal externalities that can be generated by social capital. These externalities make the aggregation process extremely complex. It is not at all clear whether we should think about social capital as networks (with positive externalities) or as status (with negative externalities). While we think that the basic economic model does quite well at helping us understand individual social capital investment, we also believe that future work must develop a new set of tools to address the complicated and important aggregation/externality issues.

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# Table 1
# $R^2$ from OLS of Number of Memberships on Group Dummies

| | Dependent variable: number of memberships | | | | | |
|---|---|---|---|---|---|---|
| Regression | (1) | (2) | (3) | (4) | (5) | (6) |
| Fixed Effects | State | PSU | Religion | State* Religion | State*Race* Religion | PSU* Religion |
| R-Squared | 0.014 | 0.039 | 0.023 | 0.061 | 0.080 | 0.106 |
| Number of Observations | 19313 | 19313 | 19265 | 19253 | 19253 | 16825 |
| Number of Dummies | 49 | 284 | 11 | 479 | 864 | 1075 |

Note: Column 6 excludes PSU religion cells with fewer than 5 observations.

## Table 2: OLS of Memberships on Demographics, Job Characteristics

| | Total Number of Memberships | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6)** |
| Constant | 18.35 | 29.84 | 33.22 | 30.40 | 31.72 | 32.65 |
| | (3.57) | (4.52) | 3.40 | (3.63) | (3.48) | (3.50) |
| Age 18-29 | .28 | -.15 | .22 | .16 | .20 | .21 |
| | (.092) | (.039) | (.087) | (.093) | (.089) | (.090) |
| Age 30-39 | .44 | .11 | .30 | .24 | .29 | .30 |
| | (.077) | (.040) | (.073) | (.078) | (.075) | (.075) |
| Age 40-49 | .48 | .23 | .35 | .33 | .35 | .36 |
| | (.064) | (.043) | (.061) | (.065) | (.062) | (.062) |
| Age 50-59 | .32 | .17 | .26 | .27 | .25 | .25 |
| | (.053) | (.046) | (.050) | (.053) | (.051) | (.051) |
| Female | -.20 | -.20 | -.19 | -.20 | -.20 | -.20 |
| | (.027) | (.027) | (.026) | (.028) | (.026) | (.026) |
| Black | -.12 | -.11 | .059 | .037 | .078 | .066 |
| | (.040) | (.040) | (.038) | (.041) | (.039) | (.040) |
| Log of Income | .66 | .67 | .31 | .30 | .30 | .30 |
| | (.029) | (.029) | (.029) | (.030) | (.029) | (.029) |
| Income Missing | .96 | .99 | .47 | .44 | .43 | .43 |
| | (.088) | (.088) | (.085) | (.089) | (.086) | (.086) |
| Birth Year | -.0094 | | -.018 | -.017 | -.017 | -.018 |
| | (.0019) | | (.0018) | (.0019) | (.0018) | (.0018) |
| Year of Survey | | -.015 | | | | |
| | | (.0023) | | | | |
| Education | | | .21 | .22 | .21 | .21 |
| | | | (.0044) | (.0049) | (.0045) | (.0047) |
| Average Sociability of Person's Occupation | | | | .073 | | |
| | | | | (.020) | | |
| Average Membership in Peer Group* | | | | | .13 | .037 |
| | | | | | (.017) | (.043) |
| R-Squared | .0477 | .0482 | .1488 | .1494 | .1493 | .1487 |
| Number of Observations | 19,257 | 19,326 | 19,214 | 16,938 | 18,603 | 18,514 |

*Notes: Regression 4 shows the relationship between social capital (number of memberships) and average sociability of the individual's occupation (see text for a description of the construction of the sociability variable). Regression 4 uses standard errors clustered by occupation. Regressions 5 & 6 report the effects of peer groups. Peer groups are defined as religion by PSU cell (e.g. Methodists in Cleveland). All peer group averages exclude the individual.* **Regression 6 is 2SLS. The instruments are the peer group averages for education, age, and marital status.*

## Table 3A
## Reported Sociability By Occupation: Top and Bottom 5

| Occupation name | Occupation code (1970) | Ave(contact w/ people on job) | N |
|---|---|---|---|
| ***Bottom 5 Sociability*** | | | |
| textile operative--knitter | 672 | 1.50 | 56 |
| textile operative--winder | 681 | 2.00 | 23 |
| billing clerk | 303 | 2.50 | 46 |
| a/c & heating repairman | 470 | 2.67 | 46 |
| musician/composer | 185 | 3.00 | 41 |
| ***Top 5 Sociability*** | | | |
| physicians | 65 | 7.00 | 53 |
| clergymen | 86 | 7.00 | 56 |
| food counter/ fountain worker | 914 | 7.00 | 85 |
| health aide | 922 | 7.00 | 98 |
| policemen & detectives | 964 | 7.00 | 96 |

Note: Ave(contact w/ people on job) is mean response to "How important do you personally consider these job characteristics: A lot of contact w/ other people?" (1-7)

## Table 3B
## Relation Between Social Capital and Contact W/ People on Job

| Ave Sociability of Person's Occupation | Total Number of Memberships | | |
|---|---|---|---|
| | Mean | Number of Observations | Standard Deviation |
| 2 | 1.06 | 49 | 2.37 |
| 3 | 1.54 | 230 | 1.63 |
| 4 | 1.50 | 343 | 1.59 |
| 5 | 1.60 | 2233 | 1.73 |
| 6 | 1.75 | 11968 | 1.89 |
| 7 | 2.00 | 2218 | 2.10 |

# TABLE 4
## Membership on Education and Home Ownership

| Dependent Variable | Coefficient on Education | Coefficient on Home Ownership | Number of Observations | |
|---|---|---|---|---|
| **Membership:** | | | | |
| Total Number of Memberships | 0.2229 | 0.3341 | 18601 | 5703 |
| | (0.0046) | (0.0590) | | |
| Member of Church Group | 0.0260 | 0.0562 | 18476 | 5670 |
| | (0.0013) | (0.0153) | | |
| Member of Fraternal Group | 0.0111 | 0.0208 | 18457 | 5669 |
| | (0.0007) | (0.0082) | | |
| Member of Service Club | 0.0171 | 0.0265 | 18453 | 5666 |
| | (0.0007) | (0.0093) | | |
| Member of Veteran's Group | 0.0015 | -0.0082 | 18448 | 5665 |
| | (0.0005) | (0.0064) | | |
| Member of Political Club | 0.0075 | 0.0086 | 18438 | 5662 |
| | (0.0004) | (0.0059) | | |
| Member of Labor union | -0.0070 | 0.0173 | 18453 | 5665 |
| | (0.0008) | (0.0094) | | |
| Member of a Sports Group | 0.0172 | 0.0254 | 18460 | 5668 |
| | (0.0010) | (0.0120) | | |
| Member of Youth Group | 0.0104 | 0.0228 | 18432 | 5659 |
| | (0.0007) | (0.0082) | | |
| Member of School Service Group | 0.0206 | 0.0408 | 18433 | 5658 |
| | (0.0008) | (0.0097) | | |
| Member of Hobby or Garden Club | 0.0103 | 0.0301 | 18430 | 5657 |
| | (0.0008) | (0.0090) | | |
| Member of School Fraternity/Sorority | 0.0119 | 0.0109 | 18429 | 5657 |
| | (0.0004) | (0.0065) | | |
| Member of Nationality Group | 0.0049 | 0.0053 | 18420 | 5657 |
| | (0.0004) | (0.0056) | | |
| Member of Farm Organization | 0.0018 | 0.0074 | 18416 | 5656 |
| | (0.0003) | (0.0035) | | |
| Member of Literary or Art Discussion or Study Group | 0.0198 | 0.0022 | 18429 | 5661 |
| | (0.0007) | (0.0088) | | |
| Member of Professional or Academic Society | 0.0404 | 0.0375 | 18436 | 5661 |
| | (0.0009) | (0.0107) | | |
| Member of Any Other Group | 0.0093 | 0.0184 | 17917 | 5632 |
| | (0.0001) | (0.0098) | | |

First row is OLS. Remaining rows show $\partial y/\partial x$ from probits. Includes controls for log(income), income missing, black, female, year of birth, age category dummies, married, number of children, regional dummies, log city population.

**Figure 1**
**Age and Social Capital**

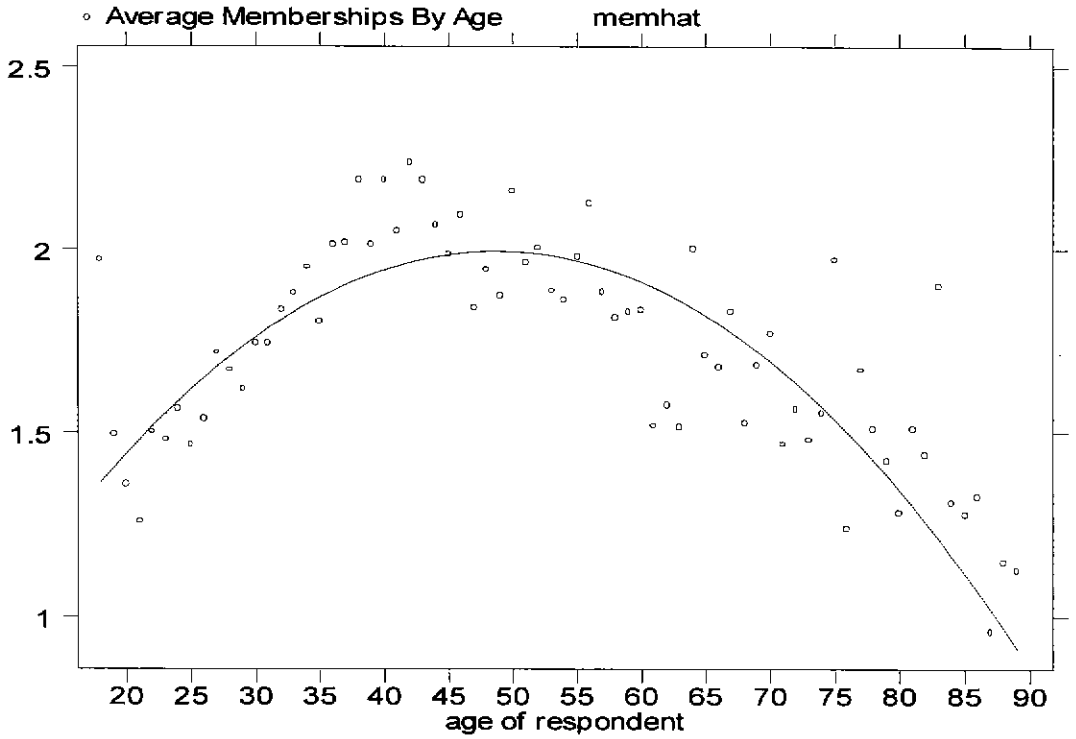
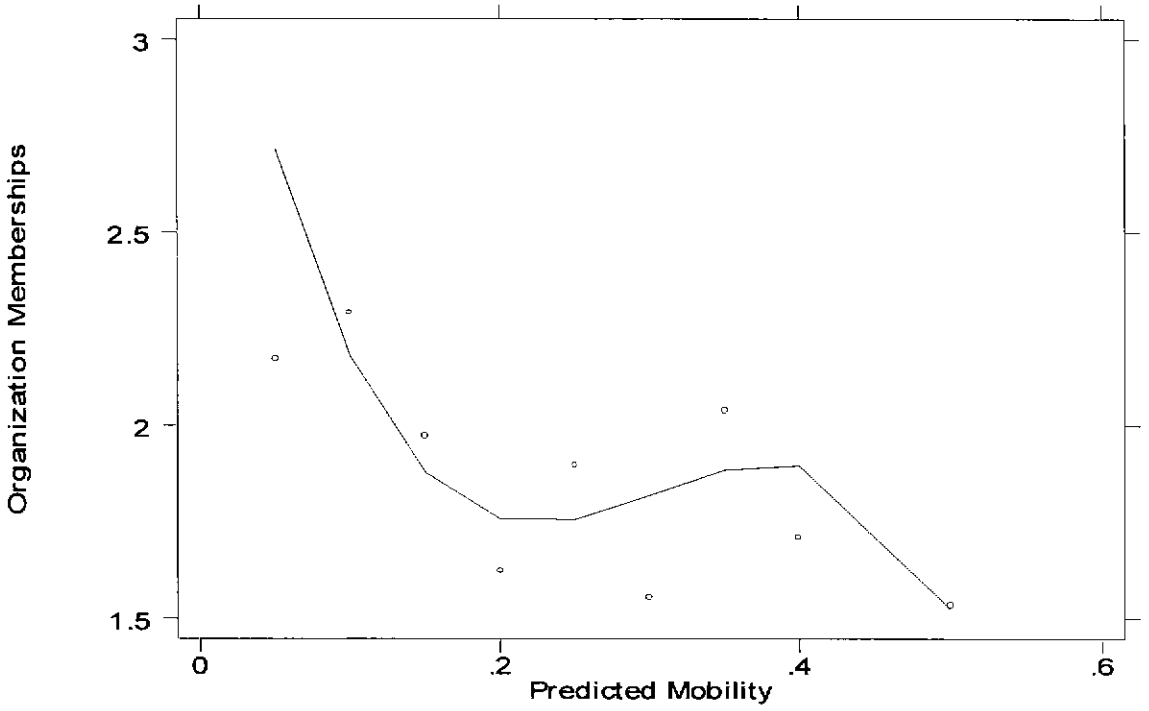


**Figure 2**
**Predicted Mobility and Social Capital**



## APPENDIX TABLE 1
## Distribution of Number of Memberships

| number of memberships | Freq. | Percent | Cum. |
|---|---|---|---|
| 0 | 5731 | 29.65 | 29.65 |
| 1 | 4953 | 25.63 | 55.28 |
| 2 | 3410 | 17.64 | 72.93 |
| 3 | 2161 | 11.18 | 84.11 |
| 4 | 1342 | 6.94 | 91.05 |
| 5 | 749 | 3.88 | 94.93 |
| 6 | 447 | 2.31 | 97.24 |
| 7 | 255 | 1.32 | 98.56 |
| 8 | 138 | 0.71 | 99.28 |
| 9 | 77 | 0.4 | 99.67 |
| 10 | 31 | 0.16 | 99.83 |
| 11 | 12 | 0.06 | 99.9 |
| 12 | 10 | 0.05 | 99.95 |
| 13 | 3 | 0.02 | 99.96 |
| 14 | 2 | 0.01 | 99.97 |
| 15 | 1 | 0.01 | 99.98 |
| 16 | 4 | 0.02 | 100 |
| Total | 19326 | 100 | |