The Formation of Social Capital

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1. Introduction

The great explosion of research on social capital following Putnam (1993) has produced an impressive body of results confirming the importance of social capital in many different domains. Putnam himself documented a striking connection between organization membership and government quality. Knack and Keefer (1997) show that a one-standard deviation increase in a measure of country-level trust increases economic growth by more than one-half of a standard deviation. La Porta, 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. Other authors have found connections between social capital and health at the individual level. There is also a clear correlation between membership in organizations and self-reported happiness.[2]

The quibbling econometrician could argue about whether these estimates are completely convincing. Social capital variables are surely correlated with many important unobservable characteristics that could be driving the observed relationship. While this annoying cynic would be right, he would also be missing the point. We are only at the beginning of research on this topic, and social scientists have already made a strong case that social capital is extraordinarily important in many domains.

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Indeed, the weakness of this research is not in either the theory or the empirical work on the *effects* of social capital. The real weakness is the lack of both theory and empirical work focusing on the *causes* of social capital. If we are going to change the level of social capital, we must have a coherent model of the formation of social capital and a body of empirical work that we trust about the formation of norms and networks. This is not to say that Putnam and others haven't done important work in this area, but rather that such work has taken the backseat to research documenting social capital's effects.

Indeed, it is my view that from the very beginning of social capital research, the social sciences' approach to social capital has sabotaged attempts to understand its causes. Social capital is usually defined as an aggregate variable: the norms and networks of a particular community, for example. However, decisions to invest in social capital are made by individuals, not communities. So without a definition of social capital that begins at the individual level we cannot begin to understand its formation.

With this premise in mind, I hope to do three things in this essay. First, I put forward a definition of individual social capital that we can view as a counterpart to the community social capital that is the primary interest of the existing social capital literature. I discuss the conditions under which individual social capital aggregates up to community social capital. After all, we are only interested in individual social capital insofar as investment in this type of capital leads to the formation of social capital at the community level. In this first section, I put forward a simple economic model of investment in social capital and discuss its empirical implications.

[2] See, for example, Chapter 20 of Putnam (2000).

In the second section, I discuss testing the most basic implications of this model. I discuss the evidence that shows that time horizons are extremely important in social capital investment. When individuals have a high probability of mobility, they are less likely to invest in social capital. When individuals are closer to death, they also eschew social capital investment. I then discuss the connection between investment and homeownership. Homeownership is an asset the value of which is closely tied to the quality of the community. As such, it creates a direct financial incentive for investment in social capital. The evidence strongly supports the existence of such a connection. Finally, any sensible model would suggest that individuals in occupations that are more social will invest more strongly in social capital. This appears to be the case. One implication of the model is that when the opportunity cost of time rises, there will be less investment in social capital. We can find little evidence that this is true.

The third section of the paper deals with the variables linked to actions of the state that appear to strongly influence social capital. First, we discuss the connection between social capital and ethnic heterogeneity. New work by Alesina and LaFerrara (2000) proposes a clear model predicting a strong negative connection between ethnic heterogeneity and group membership.

Finally, I discuss the striking connection between social and human capital. There is no more robust correlate of social capital variables than years of schooling. While I cannot be sure why this connection is so robust, I do believe that this points to a central function of schooling. Naturally, if social capital is valuable, and schooling plays a major role in creating social capital, then this has implications for education policy.[3]

[3] The relationship between education and social capital is by no means an open-and-shut issue. Helliwell and Putnam (1999) provide both a summary of and a contribution to the debate on this issue.

This essay is, of course, only a brief overview and cannot claim even the slightest element of conclusiveness. However, I cannot emphasize enough the need to begin with some individual-level model of social capital investment if we are ever going to understand the determinants of social capital formation. I believe the model I present here does well empirically and can serve as a useful basis for thinking about how investment in social capital occurs.

2. The Economics of Social Capital Formation

This conference has defined social capital as norms, networks and other related forms of social connection. I believe that the best way for an economist to think of community-level social capital is as the set of social resources of a community that increases the welfare of that community. These social resources, of course, include norms and networks. Economists tend to think that these social resources have value because they solve common economic problems. For example, better social connections can help solve the free-rider problem in providing public goods, or they can create trust between individuals in the absence of explicit contracts (hence the frequent use of trust survey questions to capture social capital). I suspect that the direct effect of social connections on utility is probably even more important than these indirect effects. While this definition perhaps moves slightly from the norms and networks definition of Coleman (1990) and Putnam (1993, 2000), I am sure that it is really quite close, and is just phrased in the language of economists.

There is an older definition of social capital that is individual-based. In 1904, Henry James wrote about the social capital of a female character in *The Golden Bowl*, by which he meant her social resources. Indeed, following James, it would be possible to

define individual social capital as the set of social attributes possessed by an individual — including charisma, contacts and linguistic skill — that increase the returns to that individual in his dealings with others. Such a definition is a precise analogue of the economic concepts of human and physical capital, and it is individual-based so we can think about the process by which an individual invests in social capital.

I don't mean to suggest that there is a conflict between an individual-based view of social capital and a community-based view of social capital. Instead, I believe that thinking about individual social capital is a prerequisite for thinking about the formation of community social capital. Since individual social capital is very close to human capital, much of the theory on investment in human capital can just be applied wholesale to social capital. The more difficult issue is aggregation. When do private social skills combine to create a more socially productive society? The issue is not as clear-cut as it may seem. For example, if a person invests in communicating well, clearly he is increasing the social capital of both himself and society. If a person invests in learning how to swindle, he is probably increasing his own social capital but decreasing the social capital of society as a whole. I will return later to the critical question of how to aggregate multiple types of individual social capital. First, I just review the simple economics of investment by individuals in social capital.

Investment in Social Capital

I just repeat a simple investment model here to remind the reader of the rich set of comparative statics that can be generated with such a model. Social capital is best thought of as a stock variable "S" which yields each period both market returns (R_M) and non-market returns (R_N). Market returns include all social skills and connections that

help one perform more effectively in one's job, as well as the role of social skills in getting jobs to begin with. Non-market returns include the wide range of social returns (perhaps including happiness directly) that can come from social capital investment. I will think of market returns as rising if the individual is in an occupation requiring more contact with other people.

There is a dynamic law of motion for S where $S_{t+1} = \delta S_t + I_t^S$, with

δ = 1-α, where α represents the rate of depreciation of accumulated social capital and *I* is the level of investment in social capital. *S* would be best measured by the social returns that an individual receives, but things like organization membership are probably best thought of as proxies for *S*, although they might also be interpreted as forms of *I*. The level of investment, *I*, has a time cost *C(I)* (increasing and convex) which is then multiplied by the opportunity cost of time, denoted *w*. Individuals live for *T* periods and discount the future at a discount rate β. I also assume that with probability θ the individual leaves his community. I assume that social capital has no value when the individual has left the community. Given these assumptions, privately optimal investment in social capital implies that in period *t*, individuals will invest to the point where marginal private costs (the cost of time, or *w*, times marginal amount of time needed for more social capital, or *C'(I)*) equals the marginal returns to social capital, or:

$$(1)\ wC'(I) = \sum_{j=1}^{T-t} \beta^j \delta^{j-1} \theta^j (R_M + R_N) = \frac{(R_M + R_N)\beta\theta(1-(\beta\delta\theta)^{T-t})}{1-\beta\delta\theta}$$

Differentiation of this condition yields the following basic results: social capital investment (1) rises with the discount factor, (2) declines with mobility, (3) declines with

opportunity cost of time, (4) increases with the occupational returns to social skills, (5) increases when the rate of depreciation declines, and (6) declines over the life cycle. These are not surprising results — these would hold for almost any capital stock. However, they will give us a benchmark set of predictions when we discuss empirical facts.

Given that the stock of social capital is a function of the flow, these comparative statics (with the exception of the results about the life cycle) will hold immediately for the stock of social capital as well. In the case of social capital as the individual ages, if social capital starts at zero, there will generally be a period of social capital accumulation and often a period where the benefits from investment are too low to justify much investment. In that period, investment will often be too little to make up for depreciation. Thus, we would expect an inverted u-shape for the relationship between social capital and age.

The Aggregation Process: Two Types of Individual Social Capital

The previous investment equation just treated social capital as a single homogeneous good, but it is useful to distinguish between two types of social skills: those that increase the utility of the community as a whole and those that yield purely private returns. Indeed, some forms of individual social capital might actually lower the utility of the community as a whole. The simplest model incorporating two classes of individual social capital just assumes that a fixed fraction of social capital yields public returns. As such, the previous model provides a complete set of predictions about both individual and community social capital, i.e. exactly the same factors that predict individual social capital will predict community social capital. I will discuss these

predictions in greater detail, but first we must consider the possibility that individuals may choose separately their investment levels in community-enhancing and community-neutral social capital. It would be quite surprising if individuals didn't turn out to have such a choice.

Most obviously, factors that induce individuals to internalize the welfare of the community will increase investment in community-enhancing social capital. Elsewhere (DiPasquale and Glaeser 1999), I present a model where homeownership induces this internalization. A home is an asset the value of which is tightly tied to the attractiveness of the community, and, therefore, owning a home will induce individuals to internalize the positive effects of their investment on the community.

It is also possible that longer expected duration in a community will mean that individuals internalize investment in the community to a greater extent. If an individual expects to move, he will be more likely to invest in skills that benefit himself but not the community. If an individual expects to stay, he will be more likely to invest in the community. It is also possible that past duration in the community will increase the altruistic attraction to other members of the community and create incentives for people to invest in kinds of social capital that make everyone better off.

One key aspect of community-enhancing social capital is that there are clear complementarities across individuals in this type of investment. Networks and languages are both pretty valueless if you are the only individual who invests in these forms of social capital. They become valuable only if many people invest simultaneously. Returns to this form of social capital are rising in the level of community investment in social capital. (It is also possible that private returns to social capital actually decrease as

more people invest in it. When people become more socially sophisticated, the skills of the car salesman may wane in power.)

Complementarities across individuals are known to result in social multipliers (see e.g. Becker and Murphy 2001). Social multipliers mean that small changes in fundamentals can lead to large changes in aggregate behavior. The idea is just that because of complementarities, as one person increases his or her level of social capital (in response to a change in fundamentals), that person causes everyone else's investment to rise as well. This type of social multiplier may help us to understand why only small changes in fundamentals may have lead to the sizable 60-year increase and 40-year drop in social capital in the U.S. between 1900 and 2000 (Putnam 2000).

This complementarity in community enhancing social capital creates the possibility for multiple equilibria that underlies much of the thinking about the determinants of social capital. When the returns to social capital investment are higher in high investment communities, then there may exist some communities with high levels of investment and high returns to investment and some with low levels of and returns to investment. Both types of community will be in equilibrium, and this may lie behind the differences between northern and southern Italy discussed in Putnam (1993).

The combination of positive externalities and complementarity leads to strong gains from coordinating investment. Naturally, this creates the case for government intervention in social capital investment. Of course, private communities can also try to coordinate themselves. This coordination is easier if the community already has a stock of social capital. The idea that social capital feeds upon itself in this way supports the multiple equilibria view of social capital discussed above. Factors that decrease the ability to coordinate, such as ethnic and linguistic heterogeneity, may, therefore, hinder

social capital investment. This type of heterogeneity may also deter social capital investment if individuals are discriminatory and consequently less interested in social contact with people who are different from them.

Since there is possibly a case for government intervention in social capital, it is worthwhile discussing the primary means through which the government can influence the investment decision. The government has policy tools through which it can influence homeownership or community permanence. These policy tools might be quite costly to use and there is no guarantee that the government will use them productively. Education may be the most powerful tool the government can use. If social skills are developed first in schools, then the 12 years that most Americans spend in public schools afford the government its greatest opportunity for influencing social capital. But we should again consider the warning that the government may be just as likely to make things worse as to make them better.

3. Social Capital and Private Incentives

In this section, I review basic facts about social capital investment and the predictions of the basic economic model of social capital investment. I will primarily discuss facts about membership in organizations, which is probably our best measure of social capital investment on the individual level. Generally U.S. data on social capital comes from the General Social Survey which is a repeated cross-section of Americans. In this survey (administered by the National Opinion Research Center, or NORC), between 1,200 and 2,500 different people are asked a rotating set of questions each year.

The social capital literature has primarily focused on two questions. First, there is a survey question on 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?" Second, there is a set of questions about types of non-professional organizations that an individual belongs to. Generally, these organization membership questions are aggregated up to a variable (generally called "organization membership") that captures the number of different types of organization to which an individual belongs.

I will generally avoid using the trust question, as elsewhere (Glaeser, Laibson, Scheinkman, and Soutter 2000), I have cast doubt on the interpretation of this survey item. Using experimental data, we have found that this question does not correlate well with real trusting behavior either towards anonymous strangers or towards friends and acquaintances. This question does correlate surprisingly well with the level of trustworthiness (i.e. if you say that others are trustworthy, you are more likely to be trustworthy yourself), but not with the level of trust. This may mean that the trust questions are still useful for capturing social capital at the group level, but since interpretation is clearly quite difficult, I will avoid discussing these questions here, except insofar as the results are the same as those for the question on organization membership.

Again, there is a question about whether organization membership is a stock of social capital or a flow of social capital investment. I will generally think of it as a stock, but in most cases there is little loss to thinking of it as a flow. The only case where this isn't true is in the relationship between social capital and age. The model generally predicts that social capital investment will decline monotonically with age (except if very young people are particularly impermanent). Social capital stocks will be non-monotonic.

Expected Duration of the Asset

The first comparative static is that as the expected duration of an investment declines, the amount of investment will also decline. In the investment equation, the parameters relating to depreciation, mobility and remaining life span all come from this basic intuition. I do not have any good measure of the rate at which social capital depreciates (although this is clearly a pressing topic for future research). However, we can create an expected mobility measure to predict the likelihood of an individual moving in the next two years. This probability of moving variable is created using age, marital status and number of teenage children, all of which strongly predict the probability of moving.

In Glaeser, Laibson and Sacerdote (2000) I present results looking at the relationship between this probability of moving and membership in organizations. There is a strong negative relationship (t-statistic of -7.5). A 20 percent increase in the probability of moving reduces the number of organizations joined by 0.15. Individuals who are more likely to move and lose their social capital are less likely to invest in that social capital. It is also true that duration in the community strongly predicts social capital (DiPasquale and Glaeser 1999).

Perhaps even more striking is the life cycle pattern of social capital. There is a very strong non-monotonic relationship between age and social capital. Glaeser, Laibson and Sacerdote (2000) show that people in their 40s are likely to be members of 0.56 more organization than people in their 20s. They are also likely to be members of 0.46 more organization than people who are over 60. There appears to be a clear inverted u-shape to the relationship between age and social capital, just as predicted by the theory. People first build up their stock of social capital and then rationally let it run down.

The Returns to Social Skills

A second implication of the model is that individuals who work in occupations with more social contact are more likely to invest more in social connections. While I do not know exactly the social returns in different occupations, the GSS does ask individuals how important they consider contact with other people to be in their jobs. Answers are given as an index ranging from 1 to 7. Glaeser, Laibson and Sacerdote (2000) form an occupation-level index of this social returns variable so that we can rank each occupation by its sociability. Indeed, the index does apparently match up well with our priors about the returns to social skills. The least social occupations are "textile operative — knitter", "textile operative — winder," and "billing clerk." The most social occupations include physicians, clergymen and police.

There is a very strong relationship between non-professional organizations and sociability at the occupation level. The mean number of types of memberships is 1.06 for people in the least sociable occupations. The mean number of types of memberships is 2 for people in the most sociable occupations. Indeed, this relationship is both statistically significant and meaningful in its magnitude.

One worry with this variable is that membership in organizations leads to a sociable job and not the reverse. To check for this possibility, we look at the effect of the sociability of one's parents' occupations. This sociability measure strongly correlates with the sociability of one's occupation and also strongly predicts the level of organization membership. This suggests that occupation may be driving organization membership and not the reverse.

Homeownership

In DiPasquale and Glaeser (1999), we extensively examine the connection between homeownership and various types of social capital. We consider organization membership and also a large number of questions about local community political knowledge and involvement. Our focus is on variables that seem to relate to community-enhancing social capital (i.e. whether you have worked to solve local problems), which the theory predicts should be a function of internalizing the benefits to the community-level quality of such actions.

We find reliably strong connections between homeownership and a wide range of citizenship variables. For example, homeowners are on average members of 0.253 more types of nonprofessional organizations than non-homeowners. Homeowners are 15.3 percent more likely to vote in local elections than renters. Homeowners are six percent more likely to work to solve problems than renters. They are also substantially more likely to go to church or to own a gun.

Again, there is a worry that homeownership does not itself cause social capital investment, but rather homeowners are different in many ways and other differences are causing social capital investment. The first way we handle this problem is by controlling for a rich array of alternative variables (number of children, marital status, age, education, etc.). The homeownership effect is quite robust to these controls. Our second approach is to instrument for homeownership using local housing market variables. This approach also leaves the homeownership effect untouched.

Our third approach is to use German panel data where we can observe the same people over time. With this data, we can test whether individuals become better citizens when they become homeowners. We find that this is the case, although the effect of homeownership is considerably weakened when we look at behavior of the same person

over time. One possible explanation for this weakening is that the effect of homeownership may require time to take effect.

The Opportunity Cost of Time

One of the predictions of the social capital investment model is that increases in the opportunity cost of time will generally lead to less investment in social capital. The most usual measure of the opportunity cost of time is the wage, but social capital investment doesn't fall with wages. Indeed, social capital investment is almost always higher among more successful people. One possibility is that this comes from the social capital-education connection and that higher wages are actually proxying for better education (I will discuss the reasons for the social capital-education connection later). An alternative possibility is that higher initial social skills lead to higher wages and higher investment in social capital.

One piece of evidence on the importance of the opportunity cost of time hypothesis is the role of television. Putnam (2000) argues that watching TV has decreased investment in social capital. There is also clear evidence for a negative correlation between hours spent watching television and social capital variables (although I have argued elsewhere that this connection is not large enough to explain the cohort trend in the trust question). The natural interpretation of the role of television is that it creates a substitute social activity that makes investment more costly. Thus, while I do not know of any evidence suggesting that higher wages crowd out social capital, the evidence on television watching does seem to corroborate the importance of opportunity costs.

4. Two Other Influences on Social Capital Formation: Ethnic Heterogeneity and Education

In this section, I discuss two other variables that appear to be closely related to social capital formation. First, I discuss education. Then I discuss ethnic heterogeneity.

Social and Human Capital

Unquestionably, the most robust correlate of social capital variables across individuals is years of schooling. For example, the raw correlation of years of education with membership in organizations is 34 percent in the General Social Survey. Using the World Values Survey (an international version of the GSS), Glaeser, Laibson and Sacerdote (2000) find a positive relationship in almost every country. This fact is true for almost every measure of social connection within America. Church attendance rises strongly with education. Working to solve local problems is almost 30 percent higher for people with college degrees relative to high school dropouts. There is also an extremely strong connection between education and trust (again the gap between high school dropouts and college graduates in saying 'yes' to the basic GSS trust question is around 30 percentage points). The education-social connection relationship should probably be seen as the most robust and most important fact about the formation of social capital.

Of course, there are many possible interpretations of this relationship. For example, if education reflected a greater orientation towards the future (i.e. higher discount factor), then we should not be surprised that people with more human capital also invest more in social capital. Alternatively, social capital may be reflecting relative prestige and it may be that interacting socially may be more pleasant for more prestigious individuals. One piece of evidence that supports this interpretation is the fact that the

relationship between education and organization membership within states or countries is much stronger than the relationship between education and organization membership across countries.

However, my preferred interpretation of the social capital — human capital relationship is that a significant part of education is learning social skills. A great deal of time is spent in schools learning how to deal with peers in an educational setting. Moreover teachers explicitly undertake training students in appropriate behavior in a variety of social settings (at the very least, teachers educate students in dealing with an adult figure in an authority position).

In younger grades, learning cooperation exists as a major part of the education process, but I don't believe that learning social skills in school stops there. Even in college (relative to working) a great deal more time is spent on constructive social activities. Indeed, many times membership in fraternities or sororities serves as the basis for social capital formation later in life. Sports are also often explicitly oriented towards learning social skills.

If schools are a primary area where social capital is developed, then it is natural to think that government policy towards social capital should focus on schools. Presumably there are choices about education policy, both in terms of subsidizing education and in terms of structuring public education, that should be made with the thought that education creates social skills. Indeed, the vast governmental involvement in education becomes much more comprehensible once we think about education's role in creating externality-producing social capital.

Ethnic and Linguistic Heterogeneity

A final factor that appears to be important in creating social capital at the community level is ethnic and linguistic heterogeneity. It is a well-known fact that the highest levels of human capital within the United States are in the states of the Old Northwest, which are among the most homogeneous in the country. Many authors have identified the percent Lutheran effect or the Scandinavian effect on social capital, which appears to be linked to the relative homogeneity of these areas. Indeed, out of the six countries with the most social capital, four are Scandinavian. At the bottom of the list of countries is Brazil, which is an enormously heterogeneous area. Ethnic heterogeneity is joined by heterogeneity of education and income, both of which also appear to depress the acquisition of social capital.

Alesina and LaFerrara (2000) convincingly document the negative effects of heterogeneity on social participation across American states. Their model focuses on the idea that if you discriminate against people who are different from you, then it becomes less pleasant to join social organizations when the state is heterogeneous. An alternative explanation is that forming social capital requires coordination and coordination is more difficult when people are different.

The importance of heterogeneity is a cause for concern. It presents us with the unpleasant suggestion that homogeneous communities may have some advantages. On the other hand, it may mean that there are particularly high gains from government actions which eliminate the gaps across races and which reduce the amount of ethnic discrimination.

5. Conclusion

The formation of social capital is a crucial topic for both positive social science and for the policy agenda of improving the level and composition of social capital. I argued here that a simple economic model of social capital investment based closely on economic models of investment in human and physical capital works well for predicting the determinants of investment. Individuals are more likely to invest in social capital when they have longer time horizons in their communities. They first build stocks of social capital and then let those stocks decline. They invest in social capital more when they are in more social occupations. Homeownership increases the level of investment in social capital. The individual based model of social capital fails only in that there is little evidence that investment in social capital declines with the opportunity cost of time.

Social capital investment is particularly strongly driven by education levels and by community homogeneity. Indeed, the number of years of schooling is generally the single strongest determinant of any number of social capital type variables. This connection remains something of a puzzle but it suggests that government education policy may be a particularly important way to address social capital investment. It is also true that community homogeneity strongly increases social capital investment. This might mean that government actions to lessen divides across races or ethnicities may be helpful.

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