Social Capital

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Abstract

This paper surveys research on social capital. We explore the concepts that motivate the social capital literature, efforts to formally model social capital using economic theory, the econometrics of social capital, and empirical studies of the role of social capital in various socioeconomic outcomes. While our focus is primarily on the place of social capital in economics, we do consider its broader social science context. We argue that while the social capital literature has produced many insights, a number of conceptual and statistical problems exist with the current use of social capital by social scientists. We propose some ways to strengthen the social capital literature.

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> ...in every community there seems to be some sort of justice, and some type of friendship, also. At any rate, fellow-voyagers and fellow-soldiers are called friends, and so are members of other communities. And the extent of their community is the extent of their friendship, since it is also the extent of the justice found there...What is just...is not the same for parents towards children as for one brother towards another, and the same for companions as for fellow-citizens, similarly with the other types of friendship...what is unjust towards of these is also different, and become more unjust as it is practiced on closer friends. It is more shocking, e.g., to rob a companion of money than to rob a fellow-citizen, to fail to help a brother than a stranger, and to strike one's father than anyone else. What is just also naturally increases with friendship, since it involves the same people and extends over an equal area.
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> Aristotle, *Nicomachean Ethics*, Book VIII, 9.61

I. Introduction

Social capital represents one of the most powerful and popular metaphors in current social science research. Broadly understood as referring to the community relations that affect personal interactions, social capital has been used to explain an immense range of phenomena, ranging from voting patterns to health to the economic success of countries. Literally hundreds of papers have appeared throughout the social science literature arguing that social capital matters in understanding individual and group differences and further that successful public policy design needs to account for the effects of policy on social capital formation.

This paper is designed to survey research on social capital. We will give primary focus to the role of social capital in economic growth and development as suggested by the presence of this paper in the Handbook of Economic Growth. That being said, this survey will discuss social capital in general as there is no part of the social capital literature that may plausibly be treated as orthogonal to the issues that arise in relating social capital to economic growth. Our objectives are threefold. First, we provide an overview of conceptual issues that underlie social capital studies. Second, we identify

some general flaws we see in the empirical social capital literature. While we would hardly claim that every social capital study suffers from these problems, we do claim that they are prevalent in the literature. Third, we make a number of recommendations on how to strengthen the social capital literature. In assessing empirical work, we will focus almost exclusively on statistical analyses of social capital. This is not because we regard qualitative studies as unimportant (we will in fact advocate their greater use in the course of our discussion) but because such studies raise very distinct conceptual and interpretative questions from their quantitative counterparts.

Much of our discussion is critical. We argue that empirical social capital studies are often flawed and make claims that are in excess of what is justified by the statistical exercises reported. However, this should not be taken as an indictment of research on social capital per se. In our judgment the role of social factors in individual and group outcomes is of fundamental importance in most of the contexts in which social capital has been studied. Hence we regard the empirical social capital literature as addressing major outstanding issues in many areas of social science. Our intent in this survey is to evaluate what is currently known and to make suggestions on how to improve future research.

The paper is organized as follows. Section II contains a discussion of how economists and other social scientists have attempted to define social capital. The section also reviews some of the contexts in which social capital has been argued to play an important causal role in various sociological outcomes. Section III discusses efforts to theorize about social capital; both heuristic and conceptual arguments are discussed as well as formal analyses. Section IV discusses econometric issues that arise in the efforts to develop empirical evidence of the role of social capital as a determinant of socioeconomic outcomes. Section V reviews the empirical literature on social capital; while this literature is far too large to cover comprehensively we believe our survey captures the range of contexts in which social capital effects have been evaluated. Section VI reviews empirical studies that analyze the determinants of social capital. Section VII contains some suggestions for improving social capital research. Section VIII concludes.

II. Social capital: basic concepts

II.i. Defining social capital

Since Loury (1977) introduced it into modern social science research and Coleman's (1988) seminal study placed it at the forefront of research in sociology, the term social capital has spread throughout the social sciences and has spawned a huge literature that runs across disciplines. Despite the immense amount of research on it, however, the definition of social capital has remained elusive. From a historical perspective, one could argue that social capital is not a concept but a *praxis*, a code word used to federate disparate but interrelated research interests and to facilitate the cross-fertilization of ideas across disciplinary boundaries. The success of social capital as a federating concept may result from the fact that no social science has managed to impose a definition of the term that captures what different researchers mean by it within a discipline, let alone across fields.[1]

While conceptual vagueness may have promoted the use of the term among the social sciences, it also has been an impediment to both theoretical and empirical research of phenomena in which social capital may play a role.[2] In order to anchor our discussion of social capital, we need a substantive definition. We begin our search by listing a number of definitions that have been proposed by some of the most influential researchers on social capital. We begin with Coleman (1990) who defines social capital as:

[1]Even if a precise definition of social capital were attempted, it is likely to be no less vague than other similar concepts. The term capital, for instance, is used to describe different things – from finance to machinery to infrastructure. Human capital similarly has many different meanings, such as education, nutrition, health, vocational skills, and knowledge. This kind of vagueness, however, is less problematic as long as researchers agree on some basic principles.

[2] Criticisms of the vagueness and inconsistency of various definitions of social capital may be found in Dasgupta (2000), Durlauf (2000), Manski (2000) and Portes (1998). Arrow (2000) goes so far as to suggest that the term social capital be abandoned.

> ...social organization constitutes social capital, facilitating the achievement of goals that could not be achieved in its absence or could be achieved only at a higher cost. (pg. 304)

Putnam *et al* (1993) provides a similar characterization,

> ...social capital...refers to features of social organization, such as trust, norms, and networks that can improve the efficiency of society... (pg. 167)

Both definitions emphasize the beneficial effects social capital is assumed to have on social aggregates. According to these definitions, social capital is a type of positive group externality. Coleman's definition suggests that the externality arises from social organization. Putnam's definition emphasizes specific *informal* forms of social organization such as trust, norms and networks. In his definition of social capital, Fukuyama (1997) argues that only certain shared norms and values should be regarded as social capital:

> Social capital can be defined simply as the existence of a certain set of informal rules or norms shared among members of a group that permits cooperation among them. The sharing of values and norms does not in itself produce social capital, because the values may be the wrong ones... The norms that produce social capital... must substantively include virtues like truth-telling, the meeting of obligations, and reciprocity. (pp. 378-379)

Other definitions characterize social capital not in terms of outcome but in terms of relations or interdependence between individuals. In later research, Putnam (2000) defines social capital as

> ...connections among individuals - social networks and the norms of reciprocity and trustworthiness that arise from them. (pg. 19)

Ostrom (2000) writes

> *Social capital* is the shared knowledge, understandings, norms, rules and expectations about patterns of interactions that groups of individuals bring to a recurrent activity. (pg. 176)

In a similar vein Bowles and Gintis (2002) state

> Social capital generally refers to trust, concern for one's associates, a willingness to live by the norms of one's community and to punish those who do not. (pg. 2)

Finally, one finds in a recent book-length treatment, Lin (2001)

> ...social capital may be defined operationally as *resources embedded in social networks and accessed and used by actors for actions.* Thus, the concept has two important components: (1) it represents resources embedded in social relations rather than individuals, and (2) access and use of such resources reside with actors. (pp. 24-25)

From these definitions, we can distinguish three main underlying ideas: (1) social capital generates positive externalities for members of a group; (2) these externalities are achieved through shared trust, norms, and values and their consequent effects on expectations and behavior; (3) shared trust, norms, and values arise from informal forms of organizations based on social networks and associations. The study of social capital is that of network-based processes that generate beneficial outcomes through norms and trust.

By this definition social capital is always desirable since its presence is equated with beneficial consequences. This formulation is quite unsatisfactory from the perspective of policy evaluation (e.g., Durlauf (1999,2002b), Portes (1998)): if one denies the appellation of social capital to contexts where strong social ties lead to immoral or unproductive behaviors, there is nothing nontrivial to say in terms of policy. Presumably it is social structures, not their consequences, which can be influenced by policymakers.

Unless we know under what conditions social structures generate beneficial outcomes, we cannot orient policy. We also note that the benefits that social capital generates for one group may disadvantage another, so that the combined effect on society need not be positive. We come back to this issue later.

The three main ideas outlined above often appear intertwined in the mind of their proponents so that one in isolation would probably not be considered social capital. For instance, there are many phenomena that generate positive (or negative) externalities. According to the definitions listed here, they would probably not be considered social capital unless they involve norms or trust. There appears to be more confusion as to whether all three parts of the definition are required for social capital. Norms and trust can be based on formal institutions such as laws and courts without reference to social networks. Yet the literature sometimes has referred to such generalized trust as social capital (e.g., Knack and Keefer (1997)). It is also unclear whether (1) and (3) alone constitute social capital. In his seminal work on job markets, for instance, Granovetter (1975) discusses how social networks are activated to share job market information, thereby speeding job search and raising the efficiency of the job matching process. This process does not, by itself, require shared norms or values. Fafchamps and Minten (2002) use the phrase 'social network capital' to describe this phenomenon.

From the perspective of empirical work, a definition of social capital limited to (1) and (2) is problematic. Things like 'norms' and 'shared values' are notoriously difficult to measure. This has led some of the less rigorous work in this area to present evidence of a beneficial group effect as evidence of social capital itself, and consequently to conclude that social capital is good. This kind of circular reasoning is of course not satisfactory since it is ultimately tautological and is not falsifiable.

A definition of social capital suitable for rigorous empirical work must identify observable variables that can be used as proxies for social capital (Portes (2000)). Norms, trust, and expectations of behavior are very broad ideas that encompass no end of phenomena. Identifying a commonly acceptable set of proxies for social capital has therefore proved a formidable task and many different variables have appeared in empirical papers purportedly to measure it. Another problem has to do with the extent to which the variables used identify well defined social influences – part (3) of our

definition. Adherence to norms can be induced for many reasons, including many that cannot be reasonably construed as social. Consequently, evidence of adherence to norms does not, by itself, constitute evidence of the importance of social networks. To the extent that social networks and associations are part of the definition of social capital, evidence must also be provided that trust and shared norms are achieved via social interaction based on interpersonal networks and associations.

II.ii The efficiency of social exchange

Perhaps a more fruitful approach for our purpose is to proceed by example, that is, to select one specific phenomenon and use it to illustrate how research on social capital can be organized. Much of the commonality in definitions of social capital and in examples given by respective authors is the focus on interpersonal relationships and social networks and their effect on the efficiency of social exchange – whether the provision of a public good, as in Coleman's work, or the better organization of markets, as in Granovetter's. At the heart of the concept of social capital is the idea that positive externalities cannot be achieved without some kind of coordination, i.e., there is coordination failure. Much of the interest in social capital stems from efforts to understand how socially efficient outcomes can occur in environments in which the sorts of conditions necessary for the classical First Welfare Theorem are not fulfilled. Efficiency of social exchange is thus a good vantage point around which to organize our assessment.

One important potential role for social capital concerns its ability to ameliorate potential inefficiencies caused by imperfect information. As Hayek (1945) was among the first to point out, information asymmetries are an inescapable feature of human society. As a result, exchange is hindered either because agents who could benefit from trade cannot find each other, or because, having found each other, they do not trust each other enough to trade. In either case, some mutually beneficial exchange does not take place. Similar principles apply to the provision of public goods. Search and trust are thus two fundamental determinants of the efficiency of social exchange. If we can finds ways of facilitating search and of fostering trust, we can improve social exchange.

There are basically two ways of achieving these dual objectives: via formal institutions (e.g., a stock exchange or a trading fair) or via interpersonal relationships (e.g., word-of-mouth communication of opportunities, repeated interactions which benefit both parties). The literature on social capital focuses principally on the latter. In the following discussion, we illustrate how social networks can raise efficiency. We begin by examining the possible effects of social networks on search. In so doing, we focus only on parts (1) and (3) of our definition of social capital since norms and trust are not central to the circulation of information (although they can play a subsidiary role). We then turn to trust, the externalities it generates, and the way to sustain trust through social networks. Public goods are discussed in the following sub-section. The relationship between social capital and economic development is examined next. The last sub-section explores the relationship between social capital and equity.

Social networks and search

The role of social capital in search can be illustrated by comparing US equity and labor markets. Given the existence of a stock market, it is very easy for a seller of stock to find a buyer at the market clearing price. This is not the case in labor markets where no equivalent institution circulates accurate and up-to-date information about jobs and workers. In his path-breaking study of the US labor market, Granovetter (1975) brought to light the role played by interpersonal relationships in channeling information about jobs and job applicants. A large proportion of jobs are allocated on the basis of personal recommendation and word-of-mouth. This can be understood as an endogenous, spontaneous adaptation to the absence of a formal clearing house equivalent to the stock market.[3]

As this comparison demonstrates, observing that social capital plays a role in markets does not, by itself, constitute evidence that social capital is necessary and should

[3] This is not to say that efforts have not been made to emulate the stock market model – from employment offices to internet sites to temporary employment agencies. But to date none of these institutions seems capable of conveying sufficiently precise information about jobs and job applicants, especially regarding worker environment, work ethics, and

be nurtured. Depending on the circumstances, the development of formal institutions may be a superior alternative.

Social capital and trust

As argued in Fafchamps (2004), trust may be understood as an optimistic expectation or belief regarding other agents' behavior. The origin of trust may vary.[4] Sometimes, trust arises from repeated interpersonal interaction. Other times, it arises from general knowledge about the population of agents, the incentives they face, and the upbringing they have received (Platteau (1994a,b)). The former can be called personalized trust and the latter generalized trust. The main difference between the two is that, for each pair of newly matched agents, the former takes time and effort to establish while the latter is instantaneous.

In most situations, trusting others enables economic agents to operate more efficiently – e.g. by invoicing for goods they have delivered or by agreeing to stop hostilities. Whenever this is the case, generalized trust yields more efficient outcomes than personalized trust. The reason is that, for any pair of agents, generalized trust is established faster and more cheaply than personal trust. This observation has long been made in the anthropological literature on generalized morality. Fostering generalized trust can thus potentially generate large efficiency gains. How this can be accomplished, however, is unclear.

Clubs and networks are different concepts having to do with the structure of links among economic agents. Clubs describe finite, closed groupings. Networks describe more complex situations in which individual agents are related only to some other agents, not all. The term 'network' is sometimes used to describe the entire set of links among a finite collection of agents. Other times, it is used to describe the set of links around a specific individual. To avoid confusion, we refer to the second concept as a subjective network.

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personal motivation. See Fafchamps (2002) and Kranton (1996) for models of spontaneous market emergence organized around interpersonal relationships.

[4] Sometimes trust is misplaced, but for the sake of brevity, we ignore this possibility here. Put differently, we assume rational expectations.

Among other things, clubs and networks can be used to describe the extent to which personalized and generalized trust exist in a population. Perfect generalized trust corresponds to the case where all agents belong to a single club (or complete network) and trust all other members. Situations in which generalized trust exists only among sub-populations (say, Jewish diamond dealers in New York, cf. Bernstein (1992)) could be described as small clubs. Situations in which individual agents only trust a limited number of agents they know individually can be described as a network.

From the above discussion, it is immediately clear that if trust is beneficial for economic efficiency, the loss from imperfect trust can be visualized as the difference between the actual trust network and the minimum network that would support all mutually beneficial trades. Following this reasoning, inefficiency is expected to be highest in societies where the trust network is very sparse (Granovetter (1995)). Inefficiency is also large when sub-groups who could benefit a lot from trading with each other are prevented from doing so by mutual isolation. This is true even if many links exist within each sub-group.

Social capital and public goods

In the preceding sub-section we discussed the role of trust in fostering exchange. Trust is also an essential ingredient in the delivery of public goods. In many cases, the state can organize the provision of public goods by taxing individuals. Whenever this is true, trust is not essential. But there are many forms of public goods that cannot be harnessed through state intervention.

In his work on PTA run schools, for instance, Coleman (1988) shows that parental involvement in school affairs has a beneficial external effect on student achievement, probably because it leads children to believe their parents care about their education. Parental involvement, in turn, requires trust to reduce and solve interpersonal conflicts and to minimize fears of free-riding. In this example, the externality is a public good that cannot be harnessed by state intervention. Voluntary participation by parents is essential.

In poor countries, there are many situations in which the state could, theoretically, intervene to provide a public good, but where it is unable to do so because its tax base

and its capacity to organize are limited. Collective action can serve as a substitute for the state. However, because it cannot rely on the coercive power of the state (e.g. the ability to tax and enforce contracts), collective action is much harder to set in motion. Two essential ingredients are then required: leadership and trust. A leader is required who is capable of convincing community members that they should voluntarily contribute to the public good. Trust is necessary to resolve conflicts among competing interests and to reduce fears of free-riding. Leaders can also help raise the level of trust in the community.

What the above discussion indicates is that delivering public goods via voluntary organizations depends critically on local trust and leadership. If these ingredients are absent, for instance after a civil war, then state intervention is likely to be much easier. Furthermore, good local leaders are rare. Projects that work well in one place because of strong local involvement need not be replicable elsewhere if local leaders are weak. Pilot projects of public good delivery through local communities may provide wrong signals if their placement is correlated with the presence of good local leaders who managed to attract the pilot project to their community.

II.iii Social capital and development

Much of the interest in social capital stems from the view that the absence of social capital represents one of the major impediments to economic development; Woolcock (1998) provides a wide ranging conceptual analysis of the role of social capital for developing societies and economies; a range of applications of social capital to economic development are collected in Dasgupta and Serageldin (2000) and Grootaert and van Bastelear (2002),. In fact, much of the current interest in social capital stems from the now classic book by Putnam, Leonardi and Nanetti (1993) which argues that Northern Italy developed faster than Southern Italy because the former was better endowed in social capital -- measured by membership in groups and clubs. One of the major claims in this literature is that social capital can facilitate the solution of collective action problems.

However, when focusing on advanced societies, the effects of social capital on economic performance are less obvious. For example, Putnam (2000), focusing on the U.S. experience since the 1950's, argues that social capital, defined as membership in formal and informal clubs, has declined monotonically since the 1950's. This is true for all states, all decades, and all measures of social capital. However, he finds no relationship between the speed of the decline of social capital and economic performance across U.S. states or across time periods. Further, the relationship between social capital and socioeconomic outcomes is even harder to characterize when one looks at subperiods. For example, the 1990's were a period of rapid economic growth in the U.S. yet it is also a period of rapid decline in social capital, at least based on the sorts of measures he uses. To be clear, Putnam does attempt to associate higher social capital with better socioeconomic outcomes, our point is that the relationship between the two for the United States is even at first glance relatively complicated.

The differences between the case of Italian regions and that of the United States is suggestive of how one might think about the relationship between development and social capital. One interpretation of these differences is that for the United States, generalized trust has improved over the period studied, so club membership has become less necessary.[5] In contrast, the Italian experience relates to an earlier period in which generalized trust may have been insufficient or incomplete and small clubs helped broaden the range of personalized trust. This raises the general possibility that clubs and networks are important at intermediate levels of development. Their function is to broaden the range and speed of social exchange beyond the confines of inter-personal trust. But once a sufficiently high level of generalized trust has been achieved, clubs and networks are no longer necessary and wither away (North (2001)). A similar kind of reasoning can be followed for public goods. In undeveloped economies, the state is weak

[5] In this discussion, we stipulate that Putnam's claims about declining U.S. social capital are correct. In fact, this claim has been subjected to important criticism. Skocpol (1996), has argued, for example, that while participation in local groups has declined, participations in larger organizations such as the American Association of Retired Persons has increased, and that what really needs be understood is the nature of voluntary group memberships and the like, rather than the number of memberships per se. See Skocpol (2003) for a detailed elaboration of this idea. One important implication of

and under-funded. Consequently it cannot organize the delivery of all needed public goods. This is particularly true for local public goods or for public goods that require a modicum of voluntary involvement to limit free-riding (of which corruption is but one manifestation).

Social capital provides an alternative. Clubs formed for non-economic purposes (e.g., religious worship) have leaders. In the absence of public good provision by the state, these leaders may decide to mobilize club members (e.g., the religious congregation) to provide missing public goods. History is replete with examples of faith-based organizations intervening to build schools and clinics and to provide a variety of public services. Here, sharing a common religious fervor is the basis for trust and the religious hierarchy provides the necessary leaders. Some large secular organizations have adopted similar practices – e.g., political parties yesterday, non-governmental organizations (NGOs) today.[6]

These issues have immediate implications for empirical work on social capital. The difficulty comes from the fact that first-best outcomes can in principle be achieved without paying attention to clubs and networks. Generalized trust in commercial contracts, for instance, can theoretically be achieved via laws and courts. Because of the possibility that revenues may be collectively raised via taxation, public goods can in principle be organized by the state at lower cost in terms of public mobilization and leadership skills. As North (1973,1990) has argued, the rise of the Western world is precisely due to the invention of institutions that protect property rights and make the state more effective at delivering public goods. Clubs, networks, and community-based voluntary organizations can improve efficiency in economic exchange and public good delivery. But these are typically second-best solutions. The first-best approach is generally to develop well-functioning legal institutions and state organizations.[7]

Skocpol's work for economists is that many of the measures that have been proposed to quantify social capital may be fundamentally flawed.

[6]One classic historical example is the role of the Social Democratic Party in organizing a range of social and cultural activities for its members in Imperial Germany, see Blackbourn (1997, chapter 8).

[7]Bowles and Gintis (2002) elaborate this type of reasoning, although in their view social capital plays a role in overcoming limits to government intervention generated by

Whether or not social capital raises efficiency we therefore argue depends on the level of institutional development. Suppose that laws and courts are insufficient to ensure respect of commercial contracts. This situation can arise anywhere (Bernstein (1996)) but it is probably most severe in poor countries where many transactions are small and buyers and sellers are too poor for court action to yield reparation (Bigsten *et al.* (2000), Fafchamps and Minten (2002)).[8] In such an environment, market exchange relies on a combination of personalized trust, legal institutions (e.g., to enforce large contracts and to punish thieves), and informal institutions (e.g., reputation sharing within business networks and communities). Whether or not social capital facilitates exchange can then be seen as a test of the strength and reach of formal institutions.

A similar line of reasoning holds for public goods. Public good delivery is best accomplished when the power of the state to tax and mobilize resources is combined with trust and community involvement. The reason is that, without voluntarily accepted discipline, government action is ineffective: taxes do not get paid, rules are not followed, civil servants become corrupt, and free riding reigns. Discipline in turn depends on the perceived legitimacy of government action and the degree of public involvement in the decision-making process. It also depends on identification with the political elites, sense of national urgency, and many other factors which are still poorly understood. The bottom-line, however, is clear: without some form of voluntary acceptance by the public, government efforts to provide public goods are likely to fail. Social capital is thus probably essential for public good delivery. But the forms it may take are likely to vary depending on local conditions, i.e., from generalized trust in government and formal institutions to interpersonal trust mobilized via clubs and networks.

II. iv. Social capital and equity

We have argued that trust is essential to both economic exchange and public good delivery. We have also argued that clubs and networks can facilitate search and provide

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information constraints and so acts as a complement to government institutions in producing efficient outcomes.

[8]Except through forced labor, as in 19th century England and France. But this is now outlawed in most countries.

an imperfect substitute to generalized trust: in the absence of generalized trust, it may be necessary to rely on clubs and networks. Unlike generalized trust, however, clubs and networks often have distributional consequences that may be quite inequitable. The reason is that, unlike generalized trust, clubs and networks only offer a partial or uneven coverage of society. If the benefits of social capital principally accrue to network members, those who happen to be included benefit from increased efficiency but those that are excluded are penalized. As Fafchamps (2002) and Taylor (2000) have shown, the creation of clubs or networks can even penalize non-members. This is because members of a club or network find it easier to deal with each other and, as a result, may stop dealing with non-members.[9]

Clubs are least conducive to equity when membership is restricted to a specific group (e.g., men or whites) or when new members are not accepted (e.g., established firms only). Even when new members are accepted without restriction, historical events can shape the composition of clubs for decades whenever entry is slow. In this case, equal opportunity need not be realized because old members have enjoyed the benefits of membership for much longer. By extension, clubs are likely to have undesirable consequences on equity whenever (1) club membership is beneficial to members and (2) entry into the club is not instantaneous. Put differently, clubs raise equity concerns whenever they have real economic benefits.

The creation of clubs may thus reinforce polarization in society between the 'in' group and the 'out' group. Investing in social capital by promoting clubs can thus have serious equity repercussions. This is true even if we ignore the fact that certain clubs may collude to explicitly dominate or exclude others (e.g., the Ku Klux Klan). A similar situation arises with networks because better connected individuals profit from their contacts (Fafchamps and Minten (2002)). Social capital can be used by certain groups to overtake others, generating between-group inequality and political tension. To the extent that between-group inequality itself favors crime and riots and deters investment, promoting social capital by promoting specific groups may, in the long-run, be counterproductive.

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[9] Of course, this is not to say that impersonal markets based on generalized trust treat all groups fairly. Statistical discrimination, for instance, naturally arises even in the absence

III. When does social capital matter?

The conceptual discussion has clarified the definition of social capital and its possible role in the development process. This discussion, however, has not precisely identified the conditions under which social capital matters. To achieve this, we need a general conceptual framework in which there is room for social capital to be beneficial.

III.i Sources of inefficiency

For social capital to increase Pareto efficiency, the decentralized equilibrium without social capital must not be Pareto efficient in the first place. Social capital can only have a beneficial effect in a second-best world. Deviations from first-best outcomes arise for a variety of reasons including externalities and free-riding, imperfect information and enforcement, imperfect competition, and the like. For social capital to be beneficial, it must therefore resolve or compensate for one of these sources of inefficiency. Secondly, whatever the source of inefficiency, there are only a limited number of ways by which social capital – or any other mechanism – may improve upon a decentralized equilibrium. First, it may resolve a coordination failure in an economy that has multiple Pareto-ranked equilibria. Second, it may alter individual incentives so as to replace the decentralized equilibrium with a superior one. Third, it may affect the technology of social exchange, for instance by opening new avenues for the circulation of information.

From these two preliminary observations, it is immediately obvious that social capital will never be the only possible solution to inefficiency. There always exist alternative mechanisms to solve coordination failure, improve individual incentives, and upgrade the technology of social exchange – such as contracts, vertical integration, state intervention, or redefinition of property rights. Of course, there are many circumstances in which social capital is a less expensive or simpler institutional solution, but it is important to recognize that it can never be the only one.

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of clubs and networks (e.g. Fafchamps (2003)).

These observations have immediate implications regarding empirical investigation. Suppose social capital improves efficiency by solving a coordination failure problem. For this to occur, the economy must have multiple Pareto-ranked equilibria. Social capital provides the leadership or coordination device necessary to select a superior equilibrium among the many possible ones. Suppose further that the researchers have multiple observations of such economies, some with social capital and some without. Since nothing precludes these economies from achieving a high equilibrium without social capital, it is inherently difficult to test its effect. Furthermore, social capital may arise endogenously as an institutional response to an inferior equilibrium. To the extent that social capital does not always succeed in moving the economy to the better equilibrium, one could have the paradoxical situation in which economies with social capital are on average at a lower equilibrium than those without. This is a standard difficulty with multiple equilibria but it is not always adequately recognized in empirical work.

Even when there is a single equilibrium, social capital never is the only possible way of improving efficiency by altering incentives or technology. Identifying the effect of social capital requires that the researcher adequately control for other possible institutional solutions. Here too, self-selection is a concern.

III.ii Channels

The literature has identified a number of channels by which social capital improves efficiency. Most of these channels fall under one or a combination of the following three categories: information sharing, group identity, and explicit coordination.

Information sharing

It is a commonplace that human beings derive satisfaction from interacting with others. Socializing often involves the transfer of information, even if the purpose of socialization is not to transfer this information. The sharing of information is then a by-

product of social interaction, a Marshallian externality. To the extent that the shared information is economically useful, socialization generates a positive externality.

Socialization may also be initiated with the intent of acquiring a specific piece of information. In this case, the transfer of information is the purpose of socialization. Because interacting with others is also a consumption good, collecting information through socialization benefits from a kind of 'subsidy' relative to non-social forms of information collection (e.g., going to the library).

The literature on social capital contains many applications of this simple idea. Barr (2000), for instance, argues that social networks among Ghanaian entrepreneurs serve to channel information about new technology. Fafchamps and Minten (1999), Granovetter (1975,1995), Montgomery (1991), Rauch and Casella (2001) and many others have emphasized the role of business networks in conveying information about employment and market opportunities. Fafchamps (2004), Greif (1993), Johnson, McMillan and Woodruff (2000), Kandori (1992) and McMillan and Woodruff (2000) have brought to light the role of social networks in circulating information about breach of contract, thereby enabling business groups to penalize and exclude cheaters. Wade (1987, 1988) discusses the role of social capital in reducing incentive problems in teams by circulating information about effort. This point has also been made in the theoretical literature on industrial organizations, where the possibility for members of a team of workers to monitor and penalize each other has been shown to increase efficiency. Social capital may also circulate information about what tasks need to be done and when. Platteau and Seki (2002) provide an illustration of this idea in the case of Japanese fishermen and the coordination of their fishing efforts to minimize cost (e.g., exchange information about fish location) and maximize revenue (e.g., coordinate the landing of fish to maximize prices).

While the evidence provided is impressive, the literature remains somewhat naïve in its assumption regarding the ease with which accurate information can be exchanged. In practice, three conditions must be satisfied for social capital to raise Pareto efficiency through the sharing of information: (1) imperfect information must be the source of inefficiency; (2) there are disincentives to spread erroneous information; (3) there are no obstacles to Pareto efficiency other than imperfect information. Even if social capital

satisfies the first condition, it may not satisfy the other two. It is also important to recognize that the information sharing benefits generated by social capital can always be obtained in another way. For instance, information sharing can be explicitly organized and budgeted within a large organization, whether public or private (enterprise, NGO). To empirically test the effect of social capital, one should control for the possible presence of such organizations.

It is so customary to blame imperfect information for economic inefficiency that other sources of inefficiency, such as imperfect contract enforcement and insufficient protection of property rights, are sometimes disregarded. Fafchamps (2002), for instance, shows how the decentralized enforcement of contracts naturally takes the form of relational contracting, even without exchange of information. In this example, contract enforcement is the channel through which social capital raises efficiency, not information sharing. In his analysis of market institutions in sub-Saharan Africa, Fafchamps (2004) points out that incentives often exist to distort the conveyed information, either to hurt a competitor or to hide one's own shortcomings. Interviews with entrepreneurs suggest that gossip is never regarded as reliable information. Guaranteeing that accurate information is transferred through social networks requires the existence of punishment mechanisms – such as the loss of reputation – penalizing false reporting. Finally, there often are obstacles to Pareto efficiency other than imperfect information. The most common one is coordination failure. We revisit this issue below.

Group identity and modification of preferences

Under the general heading of group identity and modification of preferences, we put various effects that arise because identification with a group or network affects individual preferences and choices. Economists usually regard individual preferences as exogenously given and relatively stable over time. As psychologists have shown, however, individual preferences can be manipulated through advertising or propaganda. Individual preferences can also fluctuate over time in a systematic, somewhat predictable fashion. Impulses are one particularly relevant example of such phenomenon. Individuals

have been shown to violate their own stated preferences in response to an impulse – to eat, to drink, to buy.

This introduces time inconsistency in preferences. Because agents anticipate they may be subject to impulses, they often resort to various 'tricks' that limit their future choices – such as putting money on a savings account that cannot be accessed easily, or carrying a limited amount of cash when shopping. Agents may also voluntarily enter in restrictive social arrangements in order to protect themselves against their own impulses. Alcoholic Anonymous is a good example of such a process. Participation in Rotating Savings and Credit Associations (ROSCAs) can similarly be understood as a way of forcing oneself to save.

The literature on social capital is replete with descriptions of such virtuous processes. Because these descriptions implicitly assume that social capital alters individual preferences, they often seem alien to economists. One such claim often made in the literature is the idea that social capital favors altruism and raises concerns for the common good – the 'touchy-feely' side of social capital. To see how even a minor increase in altruism can raise efficiency, consider a standard Prisoner's Dilemma (PD) game with standardized payoff matrix:

	Cooperate	Defect
Cooperate	(1,1)	(-*a*,*b*)
Defect	(*b*,-*a*)	(0,0)

with $a > 0$, $b > 1$. It is standard that (Defect,Defect) is the unique Nash equilibrium. Now suppose that players become altruistic, so that their utility is the weighted sum of their individual payoff Π_i and their opponent's individual payoff Π_j, so that $U_i = (1-\alpha)\Pi_i + \alpha\Pi_j$ where $\alpha > 0$. In this case, Defect is no longer necessarily a best response strategy; (Cooperate,Cooperate) is now a Nash equilibrium if $1 > b(1-\alpha) - a\alpha$ or equivalently, $\alpha > \frac{(b-1)}{b+a}$. This condition can be satisfied for values of α well below one half, implying that, depending on the values of *a* and *b*, even moderate levels of

altruism can eliminate the Prisoner's Dilemma. Similar reasoning can be applied to games with inferior equilibria, such as the assurance game: in these games some altruism can also eliminate Pareto inferior outcomes. The intuition behind this result is obvious: the more players internalize others' payoffs, the more they care about Pareto efficiency. When both players give equal weight to their payoff and others', they only care about aggregate welfare, what we call the common good. In this case, the equilibrium is always Pareto efficient.[10] Altruism provides an efficient solution to free-riding – a principle that most religions seem to have discovered centuries ago.

The relationship between altruism and social capital probably has to do with group identity (Akerlof and Kranton (2000)). Economic experiments using the dictator game and the trust game indeed suggest that agents exhibit more altruism and play more cooperatively if they have been induced to identify with a group (e.g., Fershtman and Gneezy (2001)).[11] This is true even if members of the group are unknown and even if they are not even seen during the experiment. These results suggest that group identification may trigger agents to adopt more altruistic preferences, thereby yielding more efficient group outcomes. If identification with a group is necessary for preferences to become more altruistic and better aligned with the common good, efforts to foster a sense of community may naturally be seen as an essential component of social capital by many researchers. This probably explains why community building is often construed as a way to foster social capital.

Social capital may also affect preferences in other ways. As argued by Fafchamps (1996) and Platteau (1994a), several mechanisms can be used to enforce contractual obligations: legal and extra-legal penalties, loss of reputation, and guilt. These same mechanisms can enforce contributions to the public good in case individual preferences are not aligned with the common good. By circulating information, social capital can magnify reputational sanctions, a point we have discussed in the previous sub-section. Group identification can also raise guilt for acting against the group's common interest.

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[10] Note that the common good equilibrium is Pareto efficient in both the original, selfish preferences Π_i and in the altruistic preferences $U_i = (1-\alpha)\Pi_i + \alpha\Pi_j$.

[11] In the trust game players play sequentially. Player 1 gives an amount X to player 2. This amount is multiplied by the researcher, usually by 2 or 3. Player 2 then gives an amount Y to player 1. There is no repetition.

In our PD game, this is formally equivalent to deducting the subjective cost associated with guilt, call it g, from the payoff b associated with defection. If this feeling is strong enough so that $b - g < 1$, defection is deterred. Since Max Weber, the literature on market development has emphasized the role played by religion in fostering business honesty (Ensminger (1992), Geertz, Geertz and Rosen (1979), Poewe (1989)). Communist work ethics propaganda can be seen as a similar effort to improve team performance by raising guilt among shirkers.

By favoring identification with a group, social capital may also affect preferences through mimicry. In the literature, this idea appears in many guises, the phrase most commonly used being 'role model'. Coleman's example of PTA-run schools is a good illustration. According to Coleman, children whose parents are involved in running the school adopt a more positive attitude towards study. This change in preferences cannot be understood as altruism: it is in the children's long-term self-interest to study. Nor does it appear to be purely the result of a sharpened sense of guilt for not studying. Rather it is related to a demonstration or role model effect: children change their preferences to mimic that of their parents. By visibly and credibly demonstrating their positive attitude towards school, parents induce a change in attitude among their children.

This kind of phenomenon is related to what economists have called 'herding behavior', that is, the drive to mimic the behavior of others. More research is needed in this area to fully comprehend the phenomenon and its implications for economic efficiency. As has been argued formally in Blume (2002), however, mimicry need not result in superior equilibria: nothing in mimicry itself precludes agents from copying bad behaviors instead of good ones. One famous example is that of a group of high school students who refused to take their graduation exam as a symbol of group identity, even though doing so hurt them all. Other examples of bad mimicry involve hazing, gang rape, crime culture, and the like. Unlike altruism, mimicry is a double-edged sword.

Coordination and leadership

Some of the beneficial effects of social capital on preferences occur by osmosis, without any purposeful action by anyone: people chat around a glass of beer and, quite by

chance, a relevant piece of information is exchanged. In many cases, however, the benefits of social capital are only achieved through purposeful action: someone has to want to improve the group's welfare and must do something about it for benefits to materialize. This is particularly true of any benefit that requires coordination in order to be achieved.

This raises a host of difficult issues having to do with the decision making process within groups. It is well beyond the scope of this Chapter to discuss these issues in detail. A few remarks are nevertheless in order. First, two essential ingredients seem to play fundamental roles in purposeful group action: leadership, and rules regarding group decision making. At this level of generality, their respective role is unclear. What is inescapable, however, is that neither of them constitutes social capital.

In very informal groupings, leadership is likely to be essential to alter individual preferences and elicit voluntary contributions to the common good. While social capital may assist the action of leaders by facilitating the circulation of information and favoring group identification, the respective roles of leadership quality and social capital are likely to be extremely difficult to disentangle. This has important implications for empirical work: if good leadership is required to achieve the coordination required to benefit from social capital, testing the effect of social capital requires controlling for the quality of leadership.

This observation also has implications for policy. Good leaders may improve efficiency by using the levers of social capital – e.g., by fostering altruistic preferences and concern for the common good; favoring group identification; preaching good behavior and making free-riders feel guilty; encouraging mimicry of good behavior through role models and the manipulation of group symbols and representations (e.g., religion, ideology). This is what practitioners in the field call 'building social capital'.[12] Many NGOs, for instance, are engaged in precisely this kind of work. Sometimes they focus on the identification and training of local leaders, something to which many NGOs refer as an example of 'capacity building' (Barr, Fafchamps, and Owens (2004)).

[12]To a number of economists, these forms of policy intervention may seem unusual because they have no effect on material incentives but operate only through mental representations. We revisit these issues in greater detail below.

Purposeful coordination can also be obtained through formal rules by which decisions are made and deviance penalized. A simple majority rule combined with fines and jail sentences for free-riders is in many cases sufficient to reach efficiency. As long as free-riding is not so prevalent as to overwhelm policing, punishments directly alter incentives in ways that align individual behavior with the common good. In this case, social capital plays little role – except perhaps in coordinating not to overwhelm the enforcement apparatus. Leadership also becomes less critical since there is no need for a charismatic leader who can affect individual preferences directly. All that is required is a 'bureaucratic' leader who can apply and enforce the rules decided by the group.

A proper investigation of the importance of social capital in economic life therefore requires a careful analysis of the rules by which decisions are reached. It is important not to credit social capital with outcomes due to formal rules. This means distinguishing between the benefits resulting directly from formal organization and the indirect benefits members derive from contact with each other. For instance, the Rotary Club has a decision making body to coordinate the date and venue of its next dinner. The coordination benefit of meeting on the same day in the same place follows directly from the Club's formal rules. But once at the dinner, there is probably no coordinated mechanism to share information among members.

This same sort of reasoning applies to schools. In addition to the effects of student attitudes discussed by Coleman, PTA-run schools have an organizational structure different from that of other schools. In particular, decisions are taken differently and funding is allocated in a different manner when parents and teachers possess decisionmaking power in schools. As Jimenez and Sawada (1999) have shown in the case of El Salvador, PTA-run schools tend to provide greater remuneration and select better teachers than other schools. These schools also exhibit lower rates of teacher absenteeism. At least part of these differences may plausibly be attributed to differences in funding and internal decision-making rules. Disentangling these effects from those of social capital is likely to be difficult and contentious.

III.iii. Formal theory

While the ideas associated with social capital have been linked to many strands of modern microeconomic theory, there has been relatively little formal modeling of social capital per se. One reason for this, we conjecture, is the absence of a generally accepted and coherent definition of social capital, as discussed.

In terms of the efforts to embody social capital in formal economic models, one approach that has been taken is to incorporate social capital in models in the context of repeated prisoner's dilemma games. In environments in which agents change partners, the sustainability of a cooperative equilibrium depends on either the likelihood with which a match today will be repeated in the future and/or the ability of an agent to access information about the past behavior of a new partner (Kandori (1992)). In this context, social capital is interpreted in terms of the factors that facilitate the existence of a cooperative equilibrium. Routledge and von Amsberg (2003), using a prisoner's dilemma environment of the type we described above, define social capital as present whenever a cooperative equilibrium exists; the key variable that determines whether cooperation can occur is the probability of trade between a pair of agents. Intuitively, if this probability is high, two agents meeting today are likely to meet in the future, so that any loss from cooperation today is compensated by future cooperation in the repeated relationship. Routledge and von Amsberg apply this idea to study how migration across regions or sectors, can, by lowering the likelihood of repeated interactions, lead to a loss of social capital. Annen (2003) defines social capital as an individual's reputation for cooperation in prisoner's dilemma games. In his analysis, this reputation depends on the extent to which information transmission about past behavior is reliable and the complexity of the network in which agents interact. Changes in either reliability or complexity can thus alter levels of social capital. Annen focuses on the question of when increases in network complexity lead to a reduction of network size or an increase in network size accompanied by greater investment in communication capacity.

Other formal theory relevant to social capital includes efforts to model the notions of trust and trustworthiness. Zak and Knack (2001) study a general equilibrium growth model in which agents facing moral hazard problems decide how much to invest in monitoring. The presence and strength of formal and informal sanctions for dishonesty are shown to have powerful implications for growth because of their role in reducing the

need to invest in monitoring. Another approach to modeling trust is due to Somanathan and Rubin (2004), who study the evolutionary stability of honest types in a population.

Perhaps the most important contribution to formal theory is Dasgupta (2002) which provides a wide ranging discussion of the relationship between social capital and formal modeling. Dasgupta argues that social capital should not be defined in terms of the presence of cooperation or some other outcome; rather that it should be regarded directly as social structure.

> "...social capital is most usefully viewed as a system of interpersonal networks...If the externalities network formation gives to are "confined", social capital is an aspect of "human capital", in the sense economists use the latter term. However, if network externalities are more in the nature of public goods, social capital is a component of what economists call "total factor productivity." (pg. 6-7)

Dasgupta's analysis is important as it indicates how the role of social capital in growth cannot be reduced to the addition of a variable to a linear cross-country growth regression. His analysis is also important in its recognition that theoretical claims about the desirability of the sorts of social structures that have been equated to social capital are to some extent artifices of particular modeling assumptions. For example, he argues that the claim that repetition of a one-shot game necessarily benefits the players of the game is not a generic finding and in fact does not generally hold for payoff structures other than the prisoner's dilemma, going on to argue that work such as Fudenburg and Maskin (1996) shows how social capital can lead to exploitive relationships. As such Dasgupta's analysis makes clear how functional notions of social capital are inconsistent with rigorous theorizing. Other conceptual discussions of social capital and social science include Ostrom and Ahn (2002) and Paldam and Svendsen (2000); the former is particularly interesting to contrast with Dasgupta (2002) as it is written from the perspective of non-economists and indicates some of the conceptual gaps between economists and other social scientists on this topic.

IV. From theory to empirics: econometrics and social capital

Having clarified the relationship between social capital and the efficiency of social exchange, we now turn to the statistical analysis of the effects of social capital. We first revisit the points raised in this section, such as the distinction between individual and aggregate efficiency effects. We then ask whether it is possible to uncover social capital effects from the sorts of data available to social scientists. In particular, we discuss the issue of identification, that is, of whether a role for social capital can be uncovered when other types of social effects may be present.

Standard practice in economics and sociology is to run regressions of some outcome of interest against a set of controls and some asserted empirical proxies for social capital. These regressions are often justified by an informal argument that the empirical proxies act as instrumental variables for the unobserved "true" social capital measure. At one extreme, one finds analyses such as Furstenburg and Hughes (1995) in which the probability that an individual drops out of school is related to variables such as the presence of a father in the household or the educational aspirations of the person's friends. In contrast, studies such as Knack and Keefer (1997) attempt to explain growth differences across entire countries using survey measures of trust.

In this section, we discuss some general econometric issues that arise in social capital studies of this type. We first examine difficulties inherent in the estimation of the benefits from social capital on the basis of individual data. These difficulties are not specific to social capital and are shared by other externalities. But they are often ignored in empirical work.

Second, we discuss the question of model specification. In particular, we review some requirements for treating a given social capital regression as causal. Next, we discuss identification. In this case, we assume that a researcher has the "correct" model of some outcome of interest and ask whether observational data on the phenomena will allow for the identification of a causal relationship between social capital and the outcome.

The basic econometric issues associated with identifying a role for social capital may be understood in the context of cross-sections. While panel data have certain advantages, notably that they allow for the researcher to control for fixed effects across units, the conditions under which social capital effects may be identified are not qualitatively different.

IV.i. Externalities and individual vs. aggregate effects

As we have discussed in Section II, the literature on social capital is interested in externalities arising from coordination failure. Much of the empirical work on social capital seeks to identify the effect of social capital on an outcome variable of interest, say, ω_i. This variable of interest can be measured at the aggregate level – e.g., country growth – or at the individual level – e.g., performance of a pupil on an exam. Empirical work on social capital can thus be divided into individual and aggregate level regressions.

The first difficulty many researchers encounter is that individual returns to social capital often are poor predictors of aggregate externalities. There are two main reasons for this: fallacy of composition and free riding. A fallacy of composition arises whenever social capital pegs individuals against each other. In a situation of competition for a finite resource, the gains made by those with more social capital lead to losses for those without, relative to a situation without social capital. Free riding is the opposite situation in which aggregate social gains are larger than those appropriated by the owners of social capital. We discuss them in turn.

Fallacy of composition

To illustrate fallacy of composition, consider a simple job search example inspired by Granovetter's work. Suppose there are M job openings and N job seekers, all identical, with $N>M$. Suppose that employers and workers do not know each other and are matched at random. Since $N>M$, all positions are filled and each worker has an equal probability of getting a job $\frac{M}{N}$. Total surplus is the sum of employer and worker

surplus. Since all workers are equivalent, total surplus is the same irrespective of which workers get the available jobs.

Next suppose that, because of interpersonal connections, a group of workers C hears about the open positions before other workers. Further suppose that $C < M$. Consequently C workers get a job with probability 1. Other workers get the remaining jobs with probability $\frac{M-C}{N-C}$ which is smaller than $\frac{M}{N}$. Total surplus is unchanged since workers are equivalent. Social networks – in this case the existence of a better connected group of workers – have no effect on the efficiency of social exchange. But they have important distributional consequences, which can be measured by regressing the probability of obtaining a job on group membership. Doing so in our example would yield a coefficient of $1-\frac{M-C}{N-C}$ on membership in the group even though the net effect of social networks on aggregate welfare is zero. What this example illustrates is that social networks can have private returns even when they have no effect – other than distributional – on the efficiency of social exchange. Observing private returns to social networks should therefore not be construed as evidence of social capital. In our example, social networks actually generate a discriminatory outcome, which is inconsistent with equality of opportunity as conceptualized by Roemer (1998) for example.[13]

The above reasoning can be extended to situations where groups, not individuals, compete with each other. Consider, for instance, high schools competing to place their graduates at Harvard. We assume that the number of admissions in Harvard is fixed and that the university selects the students with the best grades on a standardized test. Suppose that Coleman is right and that, because of the social capital effects of parental involvement in school affairs, students in PTA-run schools obtain better grades. As a result, they are more likely to go to Harvard than students from non-PTA schools. Whether or not this raises social welfare depends on how critical high school education is to university learning.

[13] A similar example could be constructed in which it is the effect of social capital on trust that matters. For instance, imagine silk produced in China and consumed in Europe. Chinese silk producers do not trust European consumers so that direct sale is not possible.

To illustrate this point, suppose that students learn all they need to know at Harvard. The only purpose of high school education is to screen out less able students. Further assume that the minimum grade required to be admitted at Harvard is higher than the grade necessary to earn one's degree: some applicants do not get in even though, if they did, they would earn their degree. In this case, the role of social capital is again to enable one group – students in PTA schools – preferential access to a rationed resource – admission at Harvard. The effect of social capital is distributional. Regressing the probability of admission in Harvard on social capital would yield a positive coefficient even though, in this example, the effect of social capital on the efficiency of social exchange is zero. Of course, we do not claim that the above example is an accurate depiction of the education system. The only purpose of the example is to illustrate the danger of estimating the beneficial effect of social capital by comparing individual or group outcomes according to whether or not they have social capital. Whenever social capital enables one group to displace another, a statistical comparison of the two groups is bound to overestimate the efficiency gain from social capital.

This example exposes another ambiguity of the concept of social capital. In our review of definitions of social capital, we noted that most authors associate social capital with the idea of beneficial group externalities. In the above – admittedly extreme – example, groups of students in PTA-run schools benefit from the social capital generated by their parents. But society as a whole does not. According to our definition, there is social capital at the level of each group but not at the aggregate level. This contradiction serves to remind us that it is perilous to define a social process as necessarily having beneficial effects.

Free riding

It is also possible that social capital generates beneficial externalities but yields no (or few) individual returns for the holders of social capital. A case in point is when the external effects of social capital are fully captured by outsiders – i.e. individuals or

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A group of traders who manages to gain the trust of both producers and consumers can then capture the silk trade.

groups who are outside the social networks or do not share the norms and values of the group – who do not incur the cost of generating the externality.

To see this, consider N groups of fishermen tapping the same fishing ground.[14] Without collective action, there is over-fishing. Suppose that fishing groups with better social capital enforce self-restraint – either through shared norms or through relational contracting – while others do not. Gains from self-restraint are shared among all fishermen, irrespective of whether they have social capital or not. Social capital increases aggregate social welfare but fishermen with less social capital have higher profit because they free ride: they benefit from the self-restraint of others without having to incur any cost. Regressing fish catch on social capital would result in a zero or negative coefficient on social capital even though it has a positive social return.

The externality can also be pecuniary. Keeping the fishing example, a similar result obtains if the fishing groups do not share a common fishing ground but sell their fish on the same market: social capital makes collusion to restrict supply possible since all fishermen benefit from higher fish prices.[15] To ascertain the effect of social capital, one needs to compare fishing groups who do not compete with each other by either accessing the same fishing ground or by selling fish on the same market.

What these examples demonstrate is that, in the presence of fallacy of composition or free riding, individual returns from social capital are poor indicators of aggregate returns. If social capital enables certain individuals or groups to capture rents at the expense of others (e.g., jobs in a non-clearing labor market, entry at Harvard when the entry criterion is excessive), individual returns to social capital exceed social returns, and social capital generates unequal outcomes. In contrast, if social capital generates positive externalities not fully appropriated by owners of social capital, individual returns underestimate social returns.

IV.ii. Model specification

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[14] This example is inspired by the work of Platteau and Seki (2002) on Japanese fishermen.

[15] An example of this situation is OPEC: not all oil producing countries are member, but they all benefit from higher prices even though only members of the cartel restrict their production.

Exchangeability

As we have noted, social capital studies have been applied to a remarkably large number of units of observation, ranging from individual farmers to countries. One natural question is whether these studies in fact use comparable observations. At an abstract level, comparability of observations is a requirement for virtually all causal studies. We raise the question in the context of social capital studies for several reasons.

First, social capital studies, particularly those that employ aggregate data, often use relatively crude sets of control variables. As a result, the residuals in the sample will contain forms of heterogeneity that call into question the placement of the observations in a common regression.

Second, social capital studies often fail to account for the reasons why different agents come to have different levels of social capital. As Durlauf (2002c) states

> ...statistical analyses of social capital typically compare outcomes for individuals or aggregates who have social capital versus those who do not. These studies, in turn, typically do not incorporate a separate theory of the determinants of social capital formation, although they do often employ instrumental variables to account for the endogeneity of social capital. However, without a theory as to why one observes differences in social capital formation, one cannot have much confidence that unobserved heterogeneity is absent in the samples under study. (pg. 464)

Notice that this argument is more general than simply arguing that social capital is an endogenous variable. Since the groups in which individuals are organized often are endogenous, there will be various forms of sample selection that need to be accounted for in empirical work.

To see that these are more than abstract concerns, consider the regressions employed in Helliwell and Putnam (2000) to show the effects of social capital on economic growth. These authors regress regional output growth in Italy against initial output and measures of civic community, institutional performance, and citizen satisfaction. They find that these three measures explain persistent differences in regional growth rates and conclude that this supports social capital explanations of

economic performance. Among the many questionable assumptions that underlie such a conclusion is the assumption that the regression they employ is using comparable objects as observations. In other words, the analysis assumes that each observation is generated by a common growth process. What must be assumed about the growth process in different regions when one includes Northern and Southern Italian regions in a regression? One answer to this question is that one must assume that given the variables included in the regression, the errors for the observations of different regions cannot be distinguished, at least from the perspective of their distributions. Put differently, one must assume that the regression is such that there is no reason to expect that the error from a particular region has a nonzero expected value, for example. But how can a regression of this crudity make such a breathtaking claim? The historical and social science literatures give any number of reasons why this assumption is false in contexts such as Italian regimes. But if the assumption is false then one cannot defend the interpretation provided by Helliwell and Putnam (2000) for their regression results.

Brock and Durlauf (2001b) argue that a way to formalize the notion of comparability is via the mathematical concept of exchangeability. We introduce this formalism as it provides a way of providing a link between the ways one thinks about data as a social scientist and the sorts of statistical assumptions that underlie regression exercises.

Suppose that for each of I observations, one has associated information F_i. This information may include factors that are quantifiable, such as the savings rate of a country, as well as factors that are not necessarily quantifiable, such as knowledge of a country's culture. Suppose that some outcome ω_i is generated by the linear model

$$\omega_i = \gamma Z_i + \eta_i \tag{1}$$

where Z_i represents that part of F_i that is controlled for in the regression. Typically, models such as (1) are interpreted as meaning that, except for differences in the value of Z_i, ω_i may be thought of as draws from a common distribution, which in turn means that the η_i's are drawn from a common distribution. Notice, however, that this notion of

being drawn from a common distribution should be determined relative to the complete information set available for each observation, i.e. F_i. Hence, interpretation of (1) presupposes that having controlled for the various Z_i's, one has no information that allows one to distinguish the residuals. Formally, the errors η_i are F_i -conditionally exchangeable, which means that

$$\mu\left(\eta_1 = a_1, \ldots, \eta_K = a_K \middle| F_1 \ldots F_I\right) = \mu\left(\eta_{\rho(1)} = a_1, \ldots, \eta_{\rho(K)} = a_K \middle| F_1 \ldots F_I\right) \tag{2}$$

where $\rho(\cdot)$ is an operator that permutes the K indices.

Exchangeability is a useful formalization because it creates a benchmark for the assessment of empirical studies. In fact, many of the standard problems that arise in regression analysis amount to exchangeability violations. For example, when a regressor is omitted from a regression, this will mean that the errors in (1) are no longer exchangeable as the distribution of a given error will depend on the distribution of the included and omitted variables. Similarly, if there is parameter heterogeneity between observations, this will imply that the distribution of a given error depends on which country it is associated with. To take a third example, self-selection can induce exchangeability violations as the errors associated with one observation may be differentiated from other differences in the implications of self-selection for the conditional expectations of the residuals. To be clear, as Brock and Durlauf (2001b) observe, exchangeability is not necessary for causally interpreting regressions. For example, heteroskedasticity in errors is an exchangeability violation, but is compatible with a structural regression interpretation. What we argue here is that good empirical practice requires that one assess whether conditional exchangeability of errors holds for the regression under study. To be more precise, we believe that a good empirical practice is to ask, for a given regression specification whether, given the information a researcher possesses about the individual observations, the researcher can justify the assumption of (2) and if not, determine whether the regression retains the interpretation the researcher wishes to place upon it.

Instrumental variables

As observed above, in many contexts social capital is endogenous social capital. The problem of endogeneity is obvious in many contexts; when one talks about membership in organizations, one must account for the fact that membership is a choice variable. In other cases, the endogeneity problem is more subtle. Measures of trust are often used to characterize social capital. Since trust presumably is related to trustworthiness in actual behavior, such measures will exhibit endogeneity problems as well.

Many researchers have recognized that social capital is endogenous and so have employed instrumental variables to allow for consistent estimation of parameters. Leaving aside issues of self-selection that are not often not appropriately addressed by instrumental variables approaches, the use of instrumental variables in social capital studies can be subjected to criticism. Specifically, in many social capital studies the choice of instrumental variables often appears to rely on ad hoc and untenable exogeneity assumptions.

For example, Narayan and Pritchett (1999), using village level data, argue that measures of village level trust can instrument for measures of group memberships. In their analysis social capital effects are argued to occur when one individual's "associational life" affects others in his village; measures of associational life include factors such as the number of group memberships. Since associational life may be a consumption good and thereby an increasing function of individual income, Narayan and Pritchett argue that it must be instrumented if one wants to identify how social capital causally affects income. Yet, there is little reason that such a variable is a valid instrument. As pointed out above, if trust is related to trustworthiness, as presumably is the case, then there is no reason why trustworthy behavior is any different than membership in an organization in terms of whether it is a choice variable. And without a theory of what determines trustworthy behavior, there is little hope of identifying credible instrumental variables for it in these types of regressions.

The choice of instrumental variables is often one of the most difficult problems in empirical work. In social capital contexts, the absence of explicit modeling of the

process by which groups are formed and social capital created means that an empirical researcher is forced to rely on intuition and guesswork. While this does not condemn all studies using instrumental variables, we do believe that inadequate attention has been paid to justifying instrumental variables in social capital contexts.

Group effects versus social capital effects

A final specification issue in social capital studies concerns the question of distinguishing between social capital and other group effects. There is no shortage of reasons why group memberships influence individuals. For example, in recent models of income inequality, primary emphasis has been given to peer group effects and role model effects as influencing educational outcomes for youths. This creates a relationship between the outcomes for a given youth and the outcomes of others in his community of residence.[16] In many modern growth models, a key assumption is the presence of various types of increasing returns to scale that are produced by externalities. These types of models often take the form of positing that the productivity of a given actor depends on the human and physical capital stocks of others. From the perspective of statistical modeling, the description of individual behavior will require the incorporation of various group-level variables.

From the perspective of empirical work, the problem is simple. If one claims that a social capital effect is present for some behavior on the basis of the statistical significance of a group-level variable, this claim will not be credible unless one is able to argue that the group-level variable is capturing social capital versus some alternative group-level effect. This problem is particularly serious when social capital is endogenous, since aggregate levels of social capital are then determined by other group-level variables, which, in absence of strong prior information, presumably include whatever aggregate variables have been omitted from a regression explaining outcomes.

[16]See Durlauf (2001,2002a) for discussion of a range of possible group-level influences on individual behavior.

IV.iii. Identification

The question of social capital and other group effects leads to the question of identification. In this section, we assume that the model under study is correctly specified and evaluate what model parameters can be recovered from observational data. This work is developed in Durlauf (2002c), a paper which builds on early work by Manski (1993) and later work by Brock and Durlauf (2001a,c) on identifying group effects in data. Our basic framework treats the level of social capital in a community as an endogenous variable that represents the aggregation of individual-specific social capital levels (for example, investments in individual-specific social capital as in Glaeser, Laibson, and Sacerdote (2002)). As such, the determination of how social capital effects individuals is an example of the "reflection problem" that Manski's seminal (1993) paper characterizes; identification problems arise when one needs to distinguish the effects of the choices of others versus the characteristics of others on an individual. Identification questions when social capital is exogenous are discussed separately.

IV.iii.a. Individual-level Data

We first consider the case where one wishes to understand the effect of social capital on some individual outcome ω_i. For individual-level data, linear versions of social capital models can be expressed as follows. Suppose that each agent i is a member of some group $g(i)$. Each individual chooses an outcome variable ω_i that is linearly dependent on some control variables. Assume these variables are of four types: an r-dimension vector of variables that are measured at the individual level, X_i; an s-dimension vector of variables (often called contextual effects) that are measured at the group level and are predetermined at the time that choices are made, $Y_{g(i)}$; an individual's expectation of the average choice of others, $\mathrm{E}\left(\omega_{g(i)} \middle| F_{g(i)}\right)$ (called an endogenous effect, cf. Manski (1993)), where this expectation is made conditional on some information set $F_{g(i)}$; and expected social capital in the community, $\mathrm{E}\left(SC_{g(i)} \middle| F_{g(i)}\right)$. The assumption that

individual behavior depends on expected rather than actual social capital does not result in any loss of generality. Similarly, our assumption that agents react to the expected behaviors and social capital levels in their group rather than the expected levels among group members other than themselves has no bearing on the analysis, cf. Brock and Durlauf (2001a,c).

We assume that the X_i and $Y_{g(i)}$ vectors are components of the information sets from which expectations are formed; these expectations are further assumed to be rational, so we work with mathematical expectations rather than subjective beliefs. The behavioral outcome is described by

$$\omega_i = k + cX_i + dY_{g(i)} + J_1 \mathrm{E}\left(\omega_{g(i)} \middle| F_{g(i)}\right) + J_2 \mathrm{E}\left(SC_{g(i)} \middle| F_{g(i)}\right) + \varepsilon_i \tag{3}$$

In order to close the model, it is necessary to specify how group level social capital is determined. We assume that group level social capital is the average of individual social capital levels, SC_i. These levels are determined by an individual-level behavioral equation that is analogous to (3):

$$SC_i = \bar{k} + \bar{c}X_i + \bar{d}Y_{g(i)} + \bar{J}_1 \mathrm{E}\left(\omega_{g(i)} \middle| F_{g(i)}\right) + \bar{J}_2 \mathrm{E}\left(SC_{g(i)} \middle| F_{g(i)}\right) + \eta_i \tag{4}$$

The identification problem amounts to asking whether the parameters in (3) are uniquely determined by the reduced form equations that describe ω_i and SC_i. In order to solve for these reduced form equations, one first applies an expectations operator to both sides of (3) and (4). For the outcome equation,

$$\mathrm{E}\left(\omega_{g(i)} \middle| F_{g(i)}\right) = k + cX_{g(i)} + dY_{g(i)} + J_1 \mathrm{E}\left(\omega_{g(i)} \middle| F_{g(i)}\right) + J_2 \mathrm{E}\left(SC_{g(i)} \middle| F_{g(i)}\right)$$

or

$$\mathrm{E}\left(\omega_{g(i)}\middle|F_{g(i)}\right)=\frac{k+cX_{g(i)}+dY_{g(i)}+J_2\mathrm{E}\left(SC_{g(i)}\middle|F_{g(i)}\right)}{1-J_1} \tag{5}$$

and for the social capital equation

$$\mathrm{E}\left(SC_{g(i)}\middle|F_{g(i)}\right)=\bar{k}+\bar{c}X_{g(i)}+\bar{d}Y_{g(i)}+\bar{J}_1\mathrm{E}\left(\omega_{g(i)}\middle|F_{g(i)}\right)+\bar{J}_2\mathrm{E}\left(SC_{g(i)}\middle|F_{g(i)}\right)$$

or

$$\mathrm{E}\left(SC_{g(i)}\middle|F_{g(i)}\right)=\frac{\bar{k}+\bar{c}X_{g(i)}+\bar{d}Y_{g(i)}+\bar{J}_1\mathrm{E}\left(\omega_{g(i)}\middle|F_{g(i)}\right)}{1-\bar{J}_2} \tag{6}$$

In these expressions, $X_{g(i)}$ is the within-group average of X_i and represents the relevant set of variables that relate individual characteristics of group members to the group-level behaviors. Subsituting out $\mathrm{E}\left(\omega_{g(i)}\middle|F_{g(i)}\right)$ and $\mathrm{E}\left(SC_{g(i)}\middle|F_{g(i)}\right)$ in (3) and (4) using the expressions in (5) and (6) produces reduced form expressions for ω_i and SC_i. Durlauf (2002c) verifies the following proposition, which describes necessary conditions for identification.

Proposition 1. Identification in linear individual-level models with social capital

Identification of the parameters in eq. (3) requires

i. The dimension of the linear space spanned by elements of $\left(1, X_i, Y_{g(i)}\right)$ is $r+s+1$.

ii. The dimension of the linear space spanned by the elements of $\left(1, X_i, X_{g(i)}, Y_{g(i)}\right)$ is at least $r+s+3$.

What this proposition states is that identification depends critically on the relationship between the vector $X_{g(i)}$ that does not appear in the behavioral equations (3) and (4) and the vectors X_i and $Y_{g(i)}$ that do appear in these equations. Intuitively, the key idea is that identification of equation (3) fails if $\mathrm{E}\left(\omega_{g(i)} \middle| F_{g(i)}\right)$ and $\mathrm{E}\left(SC_{g(i)} \middle| F_{g(i)}\right)$ are linearly dependent on the other terms in the regression, i.e. $\left(1, X_i, Y_{g(i)}\right)$. Each of these variables is a linear function of $Y_{g(i)}$ and $X_{g(i)}$. So, if $X_{g(i)}$ is linearly independent of these other regressors, identification may hold.

What does this theorem require in terms of empirical implementation? A key requirement is that there are at least two X_i variables whose within-group averages are not elements of $Y_{g(i)}$. The existence of such variables will of course depend on context. For example, one can imagine situations in which an individual's age affects his behavior, but not the average age of others in his group. The need for such prior information illustrates how field work and qualitative studies can augment formal statistical analyses.

IV.iii.b. Aggregate data

A number of social capital studies employ data that are aggregated. Typically, these studies explore the average behavior of groupings which define the social environment for the individuals that comprise them. From the perspective of estimation, one can think of such models as taking within group averages of (3) and (4), so that

$$\omega_g = k + dY_g + J_1 \mathrm{E}\left(\omega_g \middle| F_g\right) + J_2 \mathrm{E}\left(SC_g \middle| F_g\right) + \varepsilon_g \tag{7}$$

and

$$SC_g = \bar{k} + \bar{d}Y_g + \bar{J}_1 \mathrm{E}\left(\omega_g \middle| F_g\right) + \bar{J}_2 \mathrm{E}\left(SC_g \middle| F_g\right) + \eta_g \tag{8}$$

where ω_g and SC_g are group level averages.

Necessary conditions for identification in this case are also developed in Durlauf (2002c). To characterize these conditions, let $H_{\omega,g}$ and $H_{SC,g}$ denote the linear spaces spanned by those regressors Y_g with nonzero coefficients in equations (7) and (8) respectively. Let $H^c_{SC,g}$ denote that part of $H_{SC,g}$ that is orthogonal to $H_{\omega,g}$ (i.e. the linear space formed by the orthogonal complements of any basis of $H_{SC,g}$ after being projected on $H_{\omega,g}$). These spaces are used in the following proposition on identification.

Proposition 2. Identification of social capital effects with aggregate data

i. Identification of the parameters in eq. (7) requires that the dimension of the linear space $H^c_{SC,g}$ is at least 2.

ii. If J_1 is known to equal 0, then identification of the parameters of eq. (7) requires that the dimension of the linear space $H^c_{SC,g}$ is at least 1.

Relative to the identification condition for the individual level model, there are some important differences. Specifically, in the aggregate case, one no longer has access to instrumental variables based on the averaging of individual-level variables. In order to achieve identification, it is necessary to have prior knowledge of aggregate variables that affect social capital but do not affect the aggregate outcome under study. Intuitively, in the aggregate data case, one is in essence working with a standard simultaneous equations system, so cross-equation exclusion restrictions must be employed to achieve identification.

To repeat, the import of these various econometrics issues depends on the context under study, the data available to a researcher, etc. The issues raised in this section should be regarded as providing benchmarks in the assessment of empirical studies; their salience will depend on the context that is under study.

IV.iii.c. Identification with predetermined social capital

When social capital is predetermined, the relevant individual level equation is now

$$\omega_i = k + cX_i + dY_{g(i)} + J_1 \mathrm{E}\left(\omega_{g(i)} \middle| F_{g(i)}\right) + J_2 SC_{g(i)} + \varepsilon_i \tag{9}$$

which means that social capital enters the equation in a symmetric way to the contextual effects $Y_{g(i)}$. Identification for models of this type has been initially studied in Manski (1993) and subsequently by Brock and Durlauf (2001a,b); an identification problem still exists because of the potential multicollinearity of $\mathrm{E}\left(\omega_{g(i)} \middle| F_{g(i)}\right)$ with the other control variables in (9). Durlauf (2002c) provides the following necessary conditions for identification.

Proposition 3. Identification of individual level behavioral equation with exogenous social capital

Identification of the parameters in eq. (9) requires

i. The dimension of the linear space spanned by elements of $\left(1, X_i, Y_{g(i)}, SC_{g(i)}\right)$ is $r+s+2$.

ii. The dimension of the linear space spanned by the elements of $\left(1, X_i, X_{g(i)}, Y_{g(i)}, SC_{g(i)}\right)$ is at least $r+s+3$.

However, unlike the endogenous social capital case, it may be possible to identify whether the role of social capital is nonzero even if (9) is not identified. Following an argument of Manski (1993), observe that the reduced form for (9) is

$$\omega_i = \frac{k}{1-J_1} + cX_i + \frac{J_1 c}{1-J_1} X_{g(i)} + \frac{d}{1-J_1} Y_{g(i)} + \frac{J_2}{1-J_1} SC_{g(i)} + \varepsilon_i \tag{10}$$

Identification of the compound parameter $\frac{J_2}{1-J_1}$ is sufficient for determining whether there is some social capital effect. Identification of this parameter requires that the social capital variable is not linearly dependent on the other variables in (10); formally (Durlauf (2002c)) verifies

Proposition 4. Identification of a social capital effect when social capital is exogenous

If the dimension of $\left(1, X_i, X_{g(i)}, Y_{g(i)}, SC_{g(i)}\right)$ exceeds $\left(1, X_i, X_{g(i)}, Y_{g(i)}\right)$ then the presence of a social capital effect may be identified from (10).

Proposition 4 may be readily extended to the case of aggregate data; if aggregate social capital is exogenous then it is simply nothing more than an additional regressor in an aggregate outcome regression. On the other hand, if one is working with aggregate data and social capital is exogenous, then it is impossible to identify any of the model parameters. The reason is simple: there are no longer any instrumental variables available from the social capital equation to instrument $\mathrm{E}\left(\omega_{g(i)} \middle| F_{g(i)}\right)$, so no analog to Proposition 3 exists.

IV.iv. Additional issues

A number of difficulties beyond identification plague empirical work on social capital. As we have emphasized in Section II, reliance on interpersonal relationships and networks can often be seen as a symptom that formal institutions do not work well.[17] To

[17] This does not imply that networks would never be observed in well developed markets. Through interpersonal relationships, economic agents may form coalitions to subvert the market equilibrium to their advantage. Think of cartels, for instance. Clubs and networks can similarly be used to bias market outcomes, e.g., to ban non-whites or women from

illustrate how this might impact statistical analysis, suppose we have data on labor markets in different countries and we seek to estimate whether the density of social networks raises the average quality of the match between workers and employers. Suppose for the sake of argument that we have a convincing measure for the average quality of the match. Regressing this measure against the density of social networks is likely to yield incorrect results if the researcher does not control for differences in formal institutions across the countries.

For instance, employment offices may play an active match-making role in some countries. Failing to control for employment offices would underestimate the effect of social capital. In fact, if employment offices channel information more efficiently than interpersonal networks and if these networks arise in response to the absence of employment offices, countries with more networks will have less efficient labor markets.

Studies of the effects of social capital on the delivery of public goods suffer from other problems as well. Earlier in this section we have argued that social capital is difficult to disentangle from other group effects. One such group effect likely to influence empirical work is the role of leadership. Community leaders often play a crucial role in fostering the creation of social capital – e.g., membership drive – that they can harness for a particular goal. Observing a relationship between social capital and the presence of a public good may be due to the presence of a third, unobserved factor: leadership. The distinction between the two effects is important for policy because good community leaders are rare and leadership is much harder to replicate than groups.

V. Empirical studies of the effects of social capital

Following the econometric discussion, the literature on the effects of social capital may be divided into two types: individual and aggregate studies.

V.i. Individual-level studies

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certain jobs. Political clientelism is another example (Bayart (1989)). In all these cases, social capital actually reduces aggregate welfare.

Individual-level studies of social capital may be divided into studies that focus on developing societies and studies that focus on OECD societies. This division reflects more than data sets. Studies of social capital in developing societies are associated with somewhat different questions than their OECD (primarily United States-based) counterparts. This division reflects differences in underlying concerns. Development scholars are interested in social capital as a mechanism to ameliorate society-wide problems whereas interest in advanced societies tends to derive from concerns about the persistence of social exclusion and poverty in affluent societies.

A typical social capital study in this literature posits an individual outcome of the form

$$\omega_i = \gamma X_i + \pi Y_{g(i)} + JSC_{g(i)} + \varepsilon_i \tag{11}$$

where, following previous notation, X_i denotes a set of individual controls, $Y_{g(i)}$ denotes a set of group controls and $SC_{g(i)}$ denotes social capital. As such, eq. (11) corresponds to the case of exogenous social capital discussed in Section III. Evidence for the relevance of social capital is equated with the statistical significance of the coefficient *J*. In the various tables we have constructed to summarize various empirical papers, we report dependent variables and social capital measures, as well as findings based on the statistical significance standard.

Social capital and development

Links between social capital and development have been examined in a range of contexts. One reason for this is that the failure of many developing economies to achieve sustained growth has led social scientists to look for previously unexplored factors in the development process. Table 1 lists a number of studies of social capital in developing societies.

As the table indicates, a range of alternative outcomes have been studied. Similarly, a range of social capital measures have been employed. While these studies are quite disparate, there are some commonalities. First, these development studies typically focus on measures describing the social networks in which individuals participate. Fafchamps and Lund (2003), Fafchamps and Minten (2001,2002), Grootaert (2000), Isham (2002) and Narayan and Pritchett (1999) all give primary focus to the role of memberships in various organization and trading networks as determinants of economic outcomes. The quite different social capital measures used by Lee and Brinton (1996) and Palloni *et al* (2001) reflect the different outcomes they are measuring (immigration and placement in elite firms.) Further, the studies in Table 1 give primary focus to participation in organizations that can provide economic benefits in terms of information sharing and the production of collective goods. In this sense, these studies focus on economic benefits to organizations as opposed to more tangible psychological and social benefits.

From the perspective of the discussion of identification in Section III, several questions arise. First, how does one differentiate social capital effects from the presence of other group effects such as information spillovers, or the presence of common factors such as legal or political institutions? In the papers discussed here, relatively little attention has been paid to this question. Notice that the failure to consider this issue is not necessarily a damning criticism, in the sense that one may have reasons to rule out such effects in advance. However, these studies also typically fail to make good arguments that alternative social determinants of outcomes can be ignored. This strikes us as a more serious indictment in that social capital variables can easily proxy for such factors. Put differently, we have argued that social capital represents a new explanation of individual and aggregate outcomes primarily to the extent that it embodies certain types of informal norms. The empirical literature typically does not contrast this view with alternative perspectives on social interactions.

In our judgment, the more successful studies of social capital and development are those that have focused on specific phenomena that have been placed under the social capital rubric. Unsurprisingly, Fafchamps and Minten (2002) is in our view a good example of this approach. As indicated in the paper's title, the focus of the analysis is

less on social capital per se than on the role of social networks in affecting trader profitability. This paper focuses on agricultural traders in Madagascar. These traders are intermediaries between farmers and various markets in the country. Because the goods they sell (staples such as rice, potatoes, and beans) are well defined (the basic goods are homogeneous and are distinguishable by observable features such as whether they have been milled or converted to flour, etc.), it is relatively easy to measure the value added associated with a trader's activity. Fafchamps and Minten (2002) find that measures of the size of an individual trader's business network are positively associated with value added and total sales. The paper argues that a relationship between networks and these economic outcomes may be understood in the context of models of imperfect information and monitoring, which provides a clear theoretical motivation for the empirical framework as well as a plausible theoretical interpretation for the various findings.

Finally, it should be noted that while the different studies in Table 1 consistently support a role for social capital in facilitating various economic outcomes, two of the studies, Krishna (2001) and Varughese and Ostrom (2001), argue that there are important subtleties in this relationship that need to be accounted for. Krishna (2001) finds that for villages in Rajastan India, the relationship between conventional social capital measures and outcomes such as common land development and poverty reduction is sensitive to a notion of effective governance Krishna calls "capable agency." By capable agency, Krishna refers to factors such as strong leadership in organizations, frequent interactions between villagers and clients, etc. His argument is that the density of organizations, a variable often used to measure social capital, will be associated with socially better outcomes only when capable agency is present. Varughese and Ostrom (2001) find, based on a study of groups of forest users in Nepal, that levels of collective action are not well predicted by measures of ethnic, caste, and religious homogeneity within these groups. These sorts of variables are often used to proxy for social capital. Varughese and Ostrom (2001) conclude that institutional design, how decisions are made, etc, can overcome barriers to cooperation that are induced by heterogeneity. Taken together, these studies illustrate that successful group activities depend on more than the presence of social ties per se.

Social capital in OECD societies

Just as social capital has been used to explain a range of outcomes in developing economies, so it has been used to explain a range of US phenomena. Table 2 reports a number of such studies.

In comparing Tables 1 and 2, a number of differences may be identified. First, social capital studies for affluent societies are far more heterogeneous than those which we report for developing economies. One finds studies of social capital for the United States that explore outcomes ranging from mental health (Furstenburg and Hughes (1995)) to dropping out of high school (Teachman, Paasch, and Carver (1997)) to criminal activity (Hagan and McCarthy (1995)). We do not believe this reflects differences in our choices of what studies to report. Rather, interest in social capital in advanced societies has been motivated by different phenomena than in the case of developing economies. In particular, the focus on social capital appears to be motivated by a desire to understand how some individuals avoid self-harming behaviors of various types.

Second, social capital studies for affluent societies focus on somewhat different variables to proxy for social capital than their development counterparts. This may be seen in the frequent examination of parental influences in Table 2. A common assumption in studies for the US is that the parent, child, neighborhood and school relationships are a primary form of social capital. McNeal (1999), for example, explicitly argues that parent/child interactions closely correspond to what Coleman originally meant by social capital.

Another feature that distinguishes the literature on OECD societies is its focus on traditionally sociological concepts in construing social capital. One important notion is intergenerational closure, which holds when parents of a given child know both his friends as well as his friends' parents; both Morgan and Sorenson (1999a) and Sandefur, Meier, and Hernandez (1999) treat closure as an important aspect of social capital. This variable arises because, as argued originally in Coleman (1988), control and monitoring of children is sensitive to the ways that a family is embedded in a community.

While OECD social capital studies typically are based on richer data sets than those available for developing countries, these studies often suffer from serious flaws. One problem is that little discipline has been imposed on the empirical proxies used for social capital, which makes many of the empirical claims in this literature incredible. For example, authors such as Furstenburg and Hughes (1995), McNeal (1999) and Sandefur, Meier, and Hernandez (1999) treat the number of family moves as a measure of social capital for youths. The idea is that the more a family moves, the weaker the social ties between the youth and his community. This is certainly a plausible claim. However, it does not suffice to make family moves a valid social capital measure. Since moves are endogenous, the variable in essence provides an indictor for those characteristics that determine the moves. Such characteristics can be associated with different youth outcomes for reasons that have nothing to do with social capital. For example, families who make more moves plausibly contain parents who are less interested in their children than those who make fewer, since such parents may be putting less weight on the costs to children of changing neighborhoods. Parents with less interest in their children (which can be formalized by using Loury's (1981) model of intergenerational mobility and allowing for heterogeneity in the rates at which parents discount offspring utility) will presumably invest less in their children, altering their outcomes in ways similar to the purported effects of lower social capital. Our point is not that one explanation or the other is correct, but rather that neither is identified from the data. Put differently, there are good reasons to believe that there are systematic differences in the unexplained components of individual behavior that render standard estimation methods inconsistent; specifically, families asserted to posses high levels of social capital, from the perspective of the estimated model, may be expected to be associated with higher levels of parental interest in children, which means the residuals in the associated regressions no longer have conditional expectations of 0. As such, this discussion is an illustration of an exchangeability violation of the type discussed in Section III; Furstenberg and Hughes (1995) are especially susceptible to this criticism due to the lack of attention to control variables.

Similarly, little attention is typically given to the identification problem of distinguishing social capital from endogenous or other group effects. This failure derives

from the flexibility of the social capital definitions that are employed. Is a psychological propensity to behave similarly to one's peers a form of social capital? The answer to this question is unclear from the literature, since such a propensity could easily count as a type of social norm.

While none of the studies in Table 2 can be said to fully address these general statistical questions, some of the studies are nevertheless clearly valuable contributions. One paper we would identify is Morgan and Sorenson (1999a). This paper is noteworthy for its careful attention to different causal mechanisms by which social capital may matter and by the care with which empirical proxies are constructed. We would also note that the paper focuses on a very specific issue, namely why Catholic schools appear to outperform their public counterparts, where there are good prior reasons to believe social factors matter.[18] Palloni *et al* (2001) is in many ways a very different study, yet is also very admirable. This analysis focuses on a very simple notion of social capital, in studying the effect on an individual's migration decision of prior migration by a sibling. What commends this study is the immense care taken to deal with questions of unobserved heterogeneity and common factors between siblings unrelated to social capital.

Before leaving this section, we draw attention to Costa and Kahn (2003b), which provides an historical perspective on social capital. In this paper, the behavior of union soldiers in the Civil War is examined, with particular attention to rates of promotion and desertion across different companies of soldiers. Costa and Kahn find that ethnic and occupational homogeneity of companies was conducive to braver conduct by soldiers. While far removed from the types of behaviors that are usually studied using social capital, the behavior of soldiers is in fact an excellent phenomenon to examine, given the

[18] Morgan and Sorenson (1999a) has in fact engendered some controversy, see Carbonaro (1999) and Hallinan and Kubitschek (1999). The main thrust of these criticisms concerns the extent to which the social closure measures used by Morgan and Sorenson fully capture the relevant social dynamics. We believe that the rejoinder Morgan and Sorenson (1999b) effectively answers these objections; equally important, these objections do not mitigate the reasons we admire the study. The level at which debate on this paper occurred is far deeper than the great majority of efforts to link social capital concepts to data.

well documented role of social factors in battlefield conduct.[19] We believe creative exploration of data sets like this can add a great deal to the understanding of social capital.

V.ii. Aggregate studies

At the beginning of Section III, we outlined the difficulty of estimating the beneficial effects of social capital from individual data. We now turn to empirical studies that rely on aggregate data and examine whether they provide more convincing evidence of social capital. Table 3 reports a number of social capital studies that employ such data. As the Table indicates, a large number of aggregate level social capital studies have focused on the relationship between social capital and per capita output growth at a high level of aggregation, such as a country or region. As such, most of the studies of this type are variants on empirical growth regressions that have become a workhorse of modern growth economics.[20] An assessment of the aggregate studies using social capital is therefore essentially equivalent to an assessment of a set of growth regressions designed to establish that a particular variable is causally related to growth.

Growth regressions of the type found in the studies of Table 3 have been subjected to very serious methodological criticisms; examples include Brock and Durlauf (2001b), Durlauf (2000), Durlauf and Quah (1999), and Temple (2000). As argued in these papers, growth regressions suffer from several fundamental problems that make implausible the types of causal inferences one typically finds in the empirical literature. First, there is the problem of the choice of control variables. Growth theories are open-ended, which means that one growth theory does not have any logical implications for the truth or falsity of another. Hence, there is no natural way, when one wishes to test the importance of a given theory, to identify the appropriate set of theories to incorporate in a correctly specified structural growth model. As Durlauf and Quah (1999) indicate, there

[19]To be clear, social factors can play a negative role in military behavior, such as in violence against civilians. See Aaronson (1999) for discussion of the social dynamics that occurred among US soldiers during the My Lai massacre of Vietnamese civilians.
[20]See Durlauf and Quah (1999) and Temple (1999) for surveys of the methods and findings of the empirical growth literature.

are in fact more extant growth theories than there are countries to which they are supposed to apply. As a result, any given growth regression may be subjected to the criticism that relevant control variables have been omitted. While there are some possible ways to deal with this problem, see Fernandez, Ley, and Steel (2001), this problem has not been addressed in any social capital and growth studies, as far as we know.

Second, growth regressions typically fail to account properly for parameter heterogeneity across countries. Evidence of such heterogeneity may be found in Desdoigts (1999), Durlauf and Johnson (1995), and Durlauf, Kourtellos, and Minkin (2001); theoretical models that imply heterogeneous growth processes for different groups of countries include Azariadis and Drazen (1990) and Howitt and Mayer-Foulkes (2002). Failure to account for parameter heterogeneity calls into question the structural interpretation of a social capital variable as it may be proxying for this form of heterogeneity. One example that is suggestive of this possibility concerns the role of ethnic heterogeneity in growth, a question studied by Easterly and Levine (1997).[21] In this paper, the authors argue that ethnic conflict inhibits public good creation and so acts as an impediment to growth. Ethnic conflict is instrumented with a measure of ethnolinguistic diversity which proves to be strongly negatively associated with growth. Since sub-Saharan Africa has exceptionally high levels of ethnolinguistic diversity, the authors conclude that this is an important mechanism in understanding Africa's growth problems. Brock and Durlauf (2001a) reexamine this study, allowing for various types of exchangeability violations due to parameter heterogeneity, and find that the relationship between ethnolinguistic diversity and growth appears only for sub-Saharan Africa; this variable does not help explain growth patterns in the rest of the world. Brock and Durlauf's finding illustrates how growth explanations may well not be constant across countries. And for the African case, it is unclear whether the growth findings are causal or whether ethnolinguistic diversity simply proxies for some other form of "African exceptionalism."

[21]It should be noted that Easterly and Levine (1997) does not explicitly focus on social capital; however, the mechanisms by which ethnic heterogeneity can affect economic performance are in many cases the same as have been proposed in the social capital literature.

Taken as a whole, these arguments imply that the social capital/growth studies do not meet the exchangeability requirements that we discussed in Section III. While this reflects more general failings of the empirical growth literature (Brock and Durlauf (2001b)), it is also the case that growth studies using social capital have been quite insensitive to efforts in the growth literature to address these problems.

Beyond questions concerning the comparability of observations, there are unresolved issues concerning causal interpretation of growth regressions that apply to the social capital case. This is especially important given the endogeneity of aggregate measures of social capital. We are unaware of any social capital study using aggregate data that addresses causality versus correlation for social capital and growth in a persuasive way. While this is a broad brush with which to tar this empirical literature, we believe it is valid. A related problem is that we are unaware of any compelling instrumental variables for social capital in these regressions. This failure is a corollary of the absence of any strong theories of aggregate social capital determination in the social science literature that would allow one to characterize appropriate instruments.

When one turns from national-level growth studies to other aggregate studies, the plausibility of claims concerning social capital becomes stronger in some cases. A recent study by Goldin and Katz (1999) is particularly interesting in its focus on the sources for the rise of high school attendance in Iowa in the early part of the twentieth century. By focusing on characteristics of Iowa counties, they are able to avoid some of the clear problems of exchangeability that plague studies using coarser levels of aggregation. But even here, other problems arise: more important, the data available are quite weak in the sense that the variables which suggest the presence of social capital effects could equally well suggest alternative explanations. The specific variables that seem most suggestive of social capital effects are the percentage of native born citizens and the population of towns; high percentages of native born and low population sizes are each associated with higher high school attendance. Clearly, linking these correlations to a causal role for social capital or other type of social influence is speculative. To be fair, Goldin and Katz

(1999) point out that there may be alternative explanations, such as the smaller towns having fewer opportunities for those without high school educations.[22]

Overall, we conclude that aggregate social capital studies have not been successful in providing compelling empirical evidence on the effects of social capital. These studies require identifying assumptions that are incredible by conventional social science reasoning. We believe that research efforts should be directed towards micro-level studies as the problems with country-wide studies seem too intractable to overcome. Data at lower levels of aggregation, such as county data for a homogeneous place like 1915 Iowa, are likely to be more amenable to persuasive analysis, provided the issues of exchangeability and identification can be addressed adequately.

VI. Empirical studies of the level and determinants of social capital

Interest in the effects of social capital has spawned a related literature of the level of social capital and how this level is determined. Table 4 lists a range of studies that have explored this issue. It is worth noting that while attention has been given to questions of model specification and identification for models in which social capital is a causal determinant of various outcomes, we are unaware of any formal analyses that have been applied to models of social capital formation. Our conjecture is that the arguments applied to models of social capital effects can be extended in a straightforward fashion to models of social capital determinants, but this remains to be done.

One important question in the literature on the formation of social capital has been whether the extremely prominent claims by Putnam (1995,2000) that social capital in the United States has experienced a major decline are correct, and if so, whether this decline can be attributed to those factors he has described, namely, increased watching of television and the passing of the World War II generation. It appears that many of Putnam's claims have not withstood careful scrutiny. Paxton (1999) shows that there is

[22]At the other extreme, the effort by Robison and Siles (1999) to link aspects of state level income distributions to various social capital proxies fails to make any serious effort to ensure exchangeability; in addition the variables used to measure social capital, such as labor force participation, render the claims made about social capital untenable.

little evidence of secular declines of trust or overall associational activity in the United States. Bianchi and Robinson (1997) find little evidence that patterns of television viewing have much relationship to maternal employment status or other family factors often asserted to lead to lower social capital. Costa and Kahn (2003a), using more disaggregated measures of associational activity, find declines in social capital measures that are qualitatively similar to what Putnam has claimed. However, they find rather different explanations. Their analysis concludes that the decline in social capital produced "outside the home" such as volunteering is explained to a large extent by the rise in female labor force participation in the last 4 decades. This study also finds that declines in social capital produced "inside the home" such as frequency of socializing is strongly related to increases in neighborhood heterogeneity. One important implication of this work is that it places claims about a decline in US social capital in a different normative light. If increasing female labor force participation is due to the breakdown of discriminatory barriers against women in labor markets and if increasing neighborhood heterogeneity reflects a breakdown of the levels of social and ethnic segregation in the United States, then perhaps declines in social capital are best thought of as an unfortunate but necessary side effect of a movement towards a more just society and so should not be mourned.

One important aspect of this research is the move towards a causal understanding of the processes by which social capital is formed. One interesting example of such work is Brehm and Rahn (1997) who employ General Social Survey data to study the reciprocal interaction of community involvement and trust in others. Their analysis finds a stronger causal relationship between community participation to trust than the converse. This finding is indicative of the empirical importance of Dasgupta's (2002) argument that social capital should be modeled as a network.

Other studies have focused on identifying predictors of trust. For the US, Alesina and La Ferrara (2002) find that trust in others is negatively associated with community heterogeneity. Rahn and Rudolph (2002) extend work of this type in an analysis of the determinants of trust in local government. This paper finds that political culture and community heterogeneity play an important role in explaining trust. Interestingly, trust does not appear to be influenced by the form of local government as trust levels are not

predicted by whether a community has a mayor or city manager (the latter implying less popular control of local government). These studies are best regarded as reduced form analyses in that issues of causality are not specifically addressed.

An especially important effort to understand the formation of social capital is the Project on Human Development in Chicago Neighborhoods (PHDCN). This is a remarkably detailed data collection project that covers several hundred neighborhoods in Chicago. These data are proving to be very useful in delineating the detailed social structure of neighborhoods. As described in Sampson, Morenoff, and Earls (1999 pg. 639), the available data include responses to questions such as "About how often do you and people in your neighborhood do favors for each other?" and the likelihood that one's neighbors would intervene if one's child were observed skipping school.

Sampson, Morenoff, and Earls (1999) use the PHDCN to study a range of social aspects of neighborhoods. In particular, they distinguish the social capital of a neighborhood as "the resource potential of personal and organizational networks" (pg. 635) from the collective efficacy of a neighborhood, "a task-specific construct that relates to the shared expectations and mutual engagement by adults in the active support and social control of children." (pg. 635). The purpose of this distinction is to differentiate general notions of neighborhood social resources from the use of these resources. By delineating how neighborhood members help one another, for example through monitoring one another's children, Sampson, Morenoff, and Earls (1999) give a rich portrait of how neighborhoods benefit their members, illustrating how help in childrearing or trust among neighbors are important mediating variables in understanding why poor neighborhoods have adverse effects on their members. By uncovering specific mechanisms by which neighborhoods matter, this study moves beyond the common use of social capital variables in which the link between the variable and a behavioral outcome is metaphorical and all too often a black box.

VII. Suggestions for future research

As our discussion suggests, we believe that social capital studies have very often been unpersuasive. We make the following suggestions as to how one can improve this literature.

First, empirical analyses need to step back from grandiose approaches to social capital and focus on the more mundane but potentially far more fruitful task of analyzing specific social components to individual behavior. This does not require abandonment of social capital as a general organizing idea or metaphor, but rather means that evidence in favor of social capital should be derived from specific claims about social influences on individuals.

A useful contrast may be made between the Helliwell and Putnam (2000) paper, the study of regional differences in growth rates in Italy that we have criticized earlier, and a recent study by Glaeser, Laibson, Scheinkman and Soutter (2000) that explores the determinants of trust. Rather than run regressions that make incredible assumptions about the exchangeability of regional growth rates, Glaeser Laibson, Scheinkman and Soutter employ well crafted experiments to see how attitudes and background characteristics influence the choice of strategies in various economic experiments. In the context of these experiments, notions such as trust are quite well defined since it amounts to expectations about the play of other agents in the game. This well defined environment provides much more compelling evidence of how trust influences behavior than can be obtained from ad hoc regressions. The use of experiments to understand social capital is further developed in Carter and Castillo (2003,2004), who consider how variation in roles by players in economic experiments can allow for differentiation between altruism and trust as determinants of behaviors.

The importance of experimental evidence should not be exaggerated. Economic experiments are not a panacea for the limits of inference with observational data. One problem is generalizability; it is far from clear how behavior in economic experiments maps into behavior in the larger economy and society, although Glaeser Laibson, Scheinkman and Soutter make an important advance in this regard by attempting to correlate behavior in experiments with behavior in the "real world" by participants. Further, as discussed by Manski (2002) in an important recent paper, there are identification problems in experiments as it is often difficult to distinguish behavior that

is driven by altruistic preferences from behavior driven by selfish preferences but with expectations of trustworthy behavior by others. Nevertheless, Glaeser Laibson, Scheinkman and Soutter and Carter and Castillo represent a style of research that is an important advance in the social capital literature.

In addition, moving the discussion of social capital away from generalities to specific mechanisms in the way we suggest will allow one to deal with issues of endogeneity and exchangeability more effectively, since it will facilitate more precise and comprehensive modeling of causal mechanisms than one finds in the social capital literature. While the great majority of social capital studies include numerous control variables, the choice of these variables is rarely determined by careful delineation of the determinants of behavior of the agents under study. In addition, there has been little attention to questions of parameter heterogeneity.

A concrete implication of this discussion is that future research on social capital by the World Bank, for example, should be careful about the use of highly aggregated data. It is difficult to make compelling exchangeability arguments for data sets in which the observations are countries or regions. Ad hoc assumptions concerning the legitimacy of instrumental variables have plagued this literature for good reason: theories of social capital formation are underdeveloped so that it is difficult for researchers to sensibly construct aggregate measures of social capital.

Second, we believe that future data collection exercises must explicitly attempt to gather information on group-level influences, rather than on social capital alone. This should include measures of the quality of leadership. At the core of virtually all microeconomic reasoning is the general idea that decisions are purposeful outcomes based on an individual's preferences over outcomes, constraints on what actions are feasible, and beliefs over the consequences of those actions. The new social economics (cf. Durlauf and Young (2001)), is based upon the recognition that these three components to decisions are deeply influenced by social factors. A data collection exercise designed to explain a given set of outcomes should therefore be based on the

development of a typology of what sorts of social factors affect each of the components and the development of plausible empirical analogs to these social factors.[23]

The sorts of detailed data collection we advocate are in fact underway in some cases. In particular, the Project on Human Development in Chicago Neighborhoods and data collection based on the World Bank Social Capital Assessment Tool are exemplary. In each case, the levels of specificity in terms of uncovering how individuals interact in villages, communities and social networks is a great advance over the crude measures often used in social capital studies. The most obvious suggestion in terms of the design of these studies would be the exploration of the extent to which the existing survey questions are adequate in terms of dealing with the specification and identification problems we discuss in Section III. There is no quick answer to this as it would require integrating some theoretical modeling with the survey design. Nevertheless, the payoffs to such an endeavor could be quite high.

How does our admittedly very general advice differ from the way in which data collection on social capital is typically done? We have already discussed one difference, namely, the effectiveness of data collection is augmented when attention is paid to the uses to which the data will be applied. To repeat, the analysis of potential identification problems should inform data collection and not just define limits to which a data set may be used. Another important difference is that this approach avoids privileging social factors that can be construed as "social capital" over others. As we have argued, the failure to consider alternative social explanations to social capital is an important source of skepticism with respect to existing studies. More importantly, there is no *a priori* reason to assume that social capital is a more likely source of important effects than other social factors. Another difference is that our proposed approach, by separating social factors as concepts from empirical measurement, will avoid conflating the two, as often

[23] Sandefur and Laumann (1998) argue in favor of understanding social capital in terms of its benefits, identifying these as provision of information, influence and control in dealing with others, social solidarity between individuals. These types of benefits represent combinations of the preferences, constraints, and beliefs we advocate employing. An advantage of our approach is that our categories represent empirically meaningful differences in the determinants of individual behavior whereas the Sandefur and Laumann categories are necessarily interdependent and do not correspond to any

occurs. Finally, the exercise of modeling individual choice in order to determine what is meant by social factors should provide some guidance as to the appropriate levels at which these factors should be measured. Does an individual's or a society's level of trust matter for individual conduct? The appropriate answer to a question like this should derive from the decision problem at hand. Empirical studies of social capital have largely not addressed this question.

Third, there needs to be greater recognition of the limits to statistical analysis in contexts such as the evaluation of social capital. This is partly a restatement of the first suggestion in that there simply do not exist any available data or methodology that can allow an assessment of the broad claims of the sort one finds in the social capital literature. But beyond this, we believe economists need to be more receptive to the sorts of evidence found in other disciplines beyond the quantitative analyses that are standard in economics. For example, sustained descriptive histories can teach us much about the ways that social structures influence individual conduct even if they are not constructed in the form of claims about F-statistics and the like. At the other extreme, there is a wealth of information in the social psychology literature that addresses in precise ways the inchoate ideas about individual behavior that underlie the social capital literature. This suggestion requires greater openmindedness on the part of economists to nonstatistical sources of information. But the payoffs can be high both in terms of substantive understanding as well as in facilitating quantitative analyses. As the discussion of identification argued, social capital effects can only be revealed if one has prior information on what group effects do not directly influence individuals. This is information that nonstatistical studies may be able to provide.[24]

In fact, it is reasonable to argue that some aspects of the question of how social capital has facilitated socioeconomic or political development should be treated in the same spirit as questions such as what led to rise of emergence of democracy in ancient Athens versus a martial culture in ancient Sparta or what were the causes of World War I.

"natural kinds" in terms of either individual activity or collective action, at least as far as we can tell. For example, trust will affect information transmission.

[24] Of course, qualitative studies are not immune to the overinterpretation (due to ignoring identification problems) and overclaiming (due to exaggeration of the import of statistical

These are not meaningless questions; but it is necessary to accept limits as to the quantitative precision with which such questions can be answered and what it means to say the question has been answered. None of this suggests that statistical analysis should play anything other than a primary role in social capital studies; our argument is that the credibility of the social capital literature will be augmented when nonstatistical evidence is better used to motivate assumptions and suggest appropriate ways for formulating hypotheses.

VIII. Conclusions

In this Chapter, we have tried to provide an overview of the state of social capital research by both describing the state of the conceptual, theoretical and econometric literatures on social capital and by surveying a number of empirical studies. Our overall assessment of the social capital research is quite mixed. In terms of conceptual and theoretical studies of social capital, there is a considerable amount of ambiguity and confusion as to what social capital means. One conclusion we draw from our survey is that the most successful theoretical work on social capital is that which, following Dasgupta (2002), models social capital as a form of social network structure and uses the presence of that structure to understand how individual outcomes are affected in equilibrium. From the empirical perspective, the role of networks in facilitating exchange is one of the most compelling empirical findings in the social capital literature (cf. Fafchamps (2004)), so a more narrow focus on this type will likely not diminish the importance of social capital as a concept.

With respect to empirical work in general, social capital research has led to the development of a number of interesting data sets as well as the development of a number of provocative hypotheses, much of the empirical literature is at best suggestive and at worst easy to discount. So while one can point to no end of studies in which a variable that is asserted to proxy for social capital has some effect on individuals or groups, it is

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findings taken on their own terms) that we have criticized in quantitative studies. See Tarrow (1996) for criticisms along these lines.

usually very difficult to treat the finding as establishing a causal role for social capital. We have highlighted a number of studies that we think are particularly strong, but those studies we find persuasive are relatively exceptional. The defects of the empirical social capital literature are unfortunate, since the work on social capital is an active front in which the "undersocialized conception of man" for which economics has been criticized (Granovetter (1985)) is being addressed.

One recommendation we make in regard to empirical studies is that social capital literature pay far more attention to formal issues of identification, self-selection and unobserved group characteristics. These issues have been extensively studied in the closely related context of social interactions (cf. Brock and Durlauf (2001c)) and many ideas from that literature may be applied to social capital. In addition, we believe that empirical social capital studies must do a much better job of differentiating between social capital effects and alternative types of group effects.

Attempts to provide social richness to economic analysis will only succeed if the theoretical and empirical work that accompanies this effort is subjected to the same rigorous standards that are required of other analyses in economics. In contrast, the extravagant claims so often found in this literature (an outstanding example of which is Putnam (2000) who appears capable of attributing every conceivable societal virtue to social capital)[25] have little prospect of having lasting social science value. Beyond the failure to contribute to the social science enterprise, there is a legitimate concern that studies which make excessive claims and unsupported assertions can discredit social capital as an idea. In conclusion, what the empirical social capital literature ultimately needs is more matter and less art.

[25]See Durlauf (2002b) for an extended critique of Putnam (2000) which addresses the problem of overclaiming, faulting Putnam both for not dealing with some of the identification problems we hve described in Section IV as well as for failing to analyze social capital in a fashion conducive to rigorous policy analysis.

TABLE 1: INDIVIDUAL-LEVEL STUDIES OF SOCIAL CAPITAL IN DEVELOPING COUNTRIES

STUDY	AGENTS	OUTCOMES	SOCIAL CAPITAL MEASURES	FINDINGS
Carter and Maluccio (2003)	Households in KwaZulu-Natal South Africa	Child height for age	Number of associations in community and interaction of family income with community income	Social capital helps ameliorate effects of individual-specific economic shocks
Fafchamps and Minten (2002)	Food traders in Madagascar	Value added and total sales	Number of traders known, number of relatives in agricultural trade, number of potential informal traders	Number of traders known and number of potential informal traders statistically significant.
Grootaert (2000)	Rural households in Indonesia	Per capita household expenditure	Number of memberships in associations, diversity of memberships, number of meetings of associations, index of participation in decisionmaking, measure of cash contribution to associations, measure of time contribution to association, measure of orientation towards community.	Social capital index statistically significant; number of memberships, internal heterogeneity of associations and level of participation in decisionmaking appear most important.

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STUDY	AGENTS	OUTCOMES	SOCIAL CAPITAL MEASURES	FINDINGS
Isham (2002)	Households in rural Tanzania	Adoption of improved fertilizer	Village level measures of ethnic homogeneity for organizations in which households are members, levels of participation of household in organization decisionmaking, and extent to which leaders of village organization have different livelihoods than village members	Social capital measures are generally statistically significant predictors of adoption, but some regional differences exist
Krishna (2001)	Villages in Rajastan, India	Performance with respect to common land development, poverty reduction, and employment	Survey measures of participation in labor-sharing groups, trust, solidarity, and reciprocity	Efficacy of social capital is related to strength of leaders of associations, patron-client relations, etc.
Krishna and Uphoff (1999)	Villages in Rajastan, India	Collective action to restore degraded or vulnerable common lands	Social capital index based on survey answers to questions on level of collective action in village, village governance, village sense of obligation, etc.	Index is a strong predictor of better development outcomes

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STUDY	AGENTS	OUTCOMES	SOCIAL CAPITAL MEASURES	FINDINGS
Lee and Brinton (1996)	Graduates of elite colleges in South Korea	Employment opportunities at large firms	Private social capital (family and friendship ties) and institutional social capital (social ties provided by university, eg. introductions to firms)	Institutional rather than private social capital is important in determining employment opportunities
Malucccio, Haddad, and May (2001)	Households in Kwazulu-Natal Province, South Africa	Per capita total expenditure	Index of individual memberships in groups, reflecting number, gender heterogeneity, and performance, based on survey responses. Community social capital levels computed as aggregates of individual indices	Individual and community social capital measures statistically significantly associated with expenditure in 1998 but not 1993
Narayan and Pritchett (1999)	Households in rural Tanzania	Per capita household expenditure	Social capital indices constructed for both households and villages. Indices based on memberships in groups, characteristics of the groups, and household values and attitudes	Village social capital dominates individual social capital
Palloni, Massey, *et al* (2001)	Sibling pairs in Mexico	Migration to the United States	Previous migration of one sibling	Likelihood of migration is increased if a sibling has already migrated

TABLE 1: INDIVIDUAL-LEVEL STUDIES OF SOCIAL CAPITAL IN DEVELOPING COUNTRIES

STUDY	AGENTS	OUTCOMES	SOCIAL CAPITAL MEASURES	FINDINGS
Pargal, Huq, and Gilligan (1999)	Households in Dhaka, Bangladesh	Establishment of voluntary solid waste management (VWSM) systems for neighborhoods	Indices of trust, reciprocity, and sharing for neighborhoods	Reciprocity index is best predictor of likelihood that a neighborhood has VWSM system
Varughese and Ostrom (2001)	Groups of forest users in Nepal	Level of collective activity, monitoring of forest use, enforcement of harvesting constraints, etc.	Homogeneity within group in wealth, caste, ethnicity	No necessary relationship between homogeneity and level of collective action; institutional design is more important

TABLE 2: INDIVIDUAL-LEVEL STUDIES OF SOCIAL CAPITAL: OECD COUNTRIES

STUDY	ACTORS	OUTCOMES	SOCIAL CAPITAL MEASURES	FINDINGS
Costa and Kahn (2003b)	Union soldiers in the US Civil War	Performance over course of war in terms of promotions, desertion, etc.	Homogeneity of companies of soldiers with respect to ethnicity, occupation, and age	More homogeneous companies are associated with more promotions and lower rates of desertion
Fernandez, Castilla, and Moore (2000)	Phone center employers	Returns to investments	Use of employees social networks in making new hires	Investment in use of employee referrals is shown to be quite profitable
Frank and Yasumoto (1996)	French financial elite; i.e. prominent individuals associated with financial institutions	Business dealings with one another	Reciprocity, trust. Actors are organized into subgroups based on friendship ties. Trust, equated with absence of hostile business actions, such as a hostile takeover, is expected to be higher between members of common subgroup. Reciprocity, defined as supportive actions such as helping a firm fend off a hostile takeover is expected to be higher between subgroups.	Basic predictions confirmed.

TABLE 2: INDIVIDUAL-LEVEL STUDIES OF SOCIAL CAPITAL: OECD COUNTRIES

STUDY	ACTORS	OUTCOMES	SOCIAL CAPITAL MEASURES	FINDINGS
Furstenberg and Hughes (1995)	Children of teenage mothers (US)	Graduation from high school, college enrollment, economic status, avoidance of live birth, avoidance of criminal activity, mental health	Within family social capital (presence of father in home, parents' expectations for school performance, etc.), family links to community (religious involvement, help network, neighborhood quality, etc.)	Various outcomes and social capital measures statistically significantly associated, even controlling for some human capital measures
Guiso, Sapienza, and Zingales (2002)	Households in Italy	Financial activities such as use of formal credit, portfolio behavior	Electoral participation and blood donation and province level	Social capital measures for both current location and place of birth predict use of formal credit, and investment in stocks rather than cash. Effects stronger for the poorer and less educated.
Hagan, MacMillan, and Wheaton (1996)	Teenagers in Toronto	Level of educational attainment, occupational status	Parental involvement with children, family moves across neighborhoods	Both types of social capital statistically significant in predicting outcomes
Hagan and McCarthy (1995)	Teenagers (Canada)	Various forms of criminal behavior	Social variables such as criminal mentors and criminal social networks	Social variables predict criminality

TABLE 2: INDIVIDUAL-LEVEL STUDIES OF SOCIAL CAPITAL: OECD COUNTRIES

STUDY	ACTORS	OUTCOMES	SOCIAL CAPITAL MEASURES	FINDINGS
McNeal (1999)	Teenagers in US	Academic achievement in science, truancy, staying in school	Parental interactions with child and with school	Favorable social capital effects on child outcomes seem only to apply to white students from middle and upper class backgrounds
Morgan and Sorenson (1999a)	Teenagers in US	Test scores in mathematics	Social closure around school, parental involvement in school, parental knowledge of friends	Social closure is negatively associated with test scores, in contradiction to standard predictions of social capital analyses
Parcel and Menaghan (1993)	Children in US	Index of child behavioral problems	Miscellaneous measures of family structure, parents' working conditions, and parents' personal resources, such as sense of self-estimation	Role of family social capital generally confirmed through statistical significance
Sandefur, Meier, and Hernandez (1999)	Teenagers in US	Intergenerational closure, parent/child interactions, high school graduation, post-secondary enrollment, enrolling in a four-year college	Family structure, number of times child changed schools, Catholic High school attendance	Various social capital measures are associated with outcomes in ways predicted by theory.

TABLE 2: INDIVIDUAL-LEVEL STUDIES OF SOCIAL CAPITAL: OECD COUNTRIES

STUDY	ACTORS	OUTCOMES	SOCIAL CAPITAL MEASURES	FINDINGS
Sun (1999)	Teenagers (US)	Academic performance measured by test scores	Structural measures (number of school changes, family structure) and process variables (parent child interactions, participation in activities, number of parents known),	Various process variables associated with test scores.
Teachman, Paasch, and Carver (1997)	Teenagers (US)	Dropping out of high school	Family social capital (living arrangements with parents, intensity of interactions with parents), community social capital (attendance in Catholic school, number of changes in school, measures of interactions of parents with schools and friends)	Attending a Catholic school and family structure robustly statistically significant across alternative specifications

TABLE 3: AGGREGATE-LEVEL STUDIES OF SOCIAL CAPITAL

STUDY	UNITS	OUTCOMES	SOCIAL CAPITAL MEASURES	FINDINGS
Beugelsdijk and van Schalk (2001)	European Regions	Per capita output growth	Trust, group participation	Group participation helps explain growth, but not trust
Easterly and Levine (1997)	Nations	Per capita output growth	Ethnic heterogeneity measured by ethnolinguistic diversity within a country	Per capita growth negatively associated with ethnolinguistic heterogeneity; important in explaining poor performance of sub-Saharan Africa
Goldin and Katz (1999)	Iowa Counties in 1915	High school attendance	Population size of towns, density of religious organizations, percentage of population that is native born	Small towns led expansion of high school attendance. Positive relationship with other possible social capital variables
Helliwell (1996)	Asian nations	Per capita output growth	Participation in associations, trust	Social capital measures contribute little once other factors such as openness are accounted for

TABLE 3: AGGREGATE-LEVEL STUDIES OF SOCIAL CAPITAL

STUDY	UNITS	OUTCOMES	SOCIAL CAPITAL MEASURES	FINDINGS
Helliwell and Putnam (2000)	Regions in Italy	Per capita output growth	Measure of civic community (index of associations, newspaper readership, and political behavior), institutional performance, citizen satisfaction with government	For the various measures, higher social capital associated with higher growth
Knack and Keefer (1997)	Nations	Per capita output growth	Indices of civic cooperation (measuring questions such as whether it is ever justified to cheat on taxes) and trust (percentage of individuals who say most people can be trusted)	Social capital measures help predict growth
LaPorta *et al* (1997)	Nations	Government efficiency (level of corruption, etc.), participation in politics and associations, social efficiency (infrastructure quality, infant mortality, educational level, etc.)	Trust	Trust generally statistically significant

TABLE 3: AGGREGATE-LEVEL STUDIES OF SOCIAL CAPITAL

STUDY	UNITS	OUTCOMES	SOCIAL CAPITAL MEASURES	FINDINGS
Lochner, Kawachi, Brennan, and Buka (2003)	Chicago neighborhoods	Aggregate and disease-specific mortality rates for neighborhoods and gender and ethnic groups within neighborhoods	Measures of trust, reciprocity, group participation	Social capital measures help to predict white mortality; relationship with mortality of blacks is weaker
Paxton (2002)	Nations	Index of liberal democracy	Number and types of international nongovernment organization in country, trust	Democracy and social capital reciprocally related; number of trade unions, sport associations and religious organizations negatively associated with democracy, number of others positively associated
Robison and Siles (1999)	US states	Means and coefficients of variation for household income	Measures of family structure, educational achievement, crime and labor force participation	Higher social capital proxies generally associated with higher means and lower dispersion in household income
Zak and Knack (2001)	Nations	Per capita output growth	Trust	Trust predicts growth even when factors such as property rights are controlled for.

TABLE 4: STUDIES OF SOCIAL CAPITAL FORMATION AND THE LEVEL OF SOCIAL CAPITAL

STUDY	AGENTS	SOCIAL CAPITAL MEASURES	POTENTIAL DETERMINANTS	FINDINGS
Alesina and La Ferrara (2002)	Adults in US	Trust	Miscellaneous personal and community characteristics	Low social capital measures for individuals are associated with membership in groups that have experienced discrimination (e.g. being African American), lack of economic success, community heterogeneity, experience of personal trauma
Bianchi and Robinson (1997)	Pre-teenagers in California	Time spent on studying and activities other than watching television	Family structure, parental characteristics, mother's labor force status	Study is higher and television watching lower among children of better educated; children of working mothers watch less television than others

TABLE 4: STUDIES OF SOCIAL CAPITAL FORMATION AND THE LEVEL OF SOCIAL CAPITAL

STUDY	AGENTS	SOCIAL CAPITAL MEASURES	POTENTIAL DETERMINANTS	FINDINGS
Brehm and Rahn (1997)	Adults in US	Civic engagement and civic trust	Reciprocal relationship between engagement and trust, confidence in institutions, life satisfaction, ethnicity, socioeconomic status, and many others	Participation strongly affects trust, each positively associated with socioeconomic status, confidence, negatively associated with being black
Charles and Kline (2002)	Adults in US	Carpooling	Ethnicity of neighbors	Ethnic heterogeneity reduces social capital formation for some pairings, notably whites and blacks and whites and Hispanics
Costa and Kahn (2003a)	Adults in US	Volunteering, socializing, non-church memberships,	Gender, community characteristics (race and income heterogeneity)	Declines in social capital produced outside the home such as volunteering are strongly related to higher female labor force participation; declining social capital within home such as frequency of socializing is strongly related to higher community heterogeneity

TABLE 4: STUDIES OF SOCIAL CAPITAL FORMATION AND THE LEVEL OF SOCIAL CAPITAL

STUDY	AGENTS	SOCIAL CAPITAL MEASURES	POTENTIAL DETERMINANTS	FINDINGS
DiPasquale and Glaeser (1999)	Adults in US	Citizenship (voting in local elections, helping solve local problems, knows school head, etc.)	Home ownership	Homeownership helps predict a range of citizenship variables.
Fafchamps (2003)	Traders in Benin, Madagascar, and Malawi	Trust in trading relationships	Ethnicity and religious similarity, gender, network effects	Ethnicity, religion and gender appear to have little effect on trust. Individuals possessing large numbers of business contacts give and receive more trust.
Gugerty and Kremer (2002)	Women's groups and school development projects in western Kenya	For women's groups, group size, attendance, financial status, and level of interactions with other groups and individuals; For schools, participation in school development projects	Funding of groups and funding of school textbooks.	Grants to women's groups appear to have had little effect on the capacities or size of women's groups; grants to governing committees of schools and increases in textbook funding were associated with increased participation of parents in school development; additional effects were found for textbook funding

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STUDY	AGENTS	SOCIAL CAPITAL MEASURES	POTENTIAL DETERMINANTS	FINDINGS
Hofferth, Boisjoly, and Duncan (1999)	Adults in US	Access to time and financial assistance from relatives and friends	Previous provision of time and financial assistance to those same relatives and friends	Time and assistance from friends is predicted by past provision, but not time and assistance by relatives
Miguel, Gertler, and Levine (2001)	Districts in Indonesia	Density of community organizations	Rapid industrialization within district	Industrialization, if anything was associated with rising density of organizations. Districts that neighbored districts experiencing rapid industrialization exhibited some declines, possibly due to out-migration
Oliver (1999)	Adults in US	Local civic participation	Community affluence and associated levels of social needs, competition for resources induced by population heterogeneity	Heterogeneous, middle income cities exhibit higher levels of civic participation than heterogeneous, affluent cities
Paxton (1999)	Adults in US	Trust, participation in various associations	Time	No strong evidence of declines in social capital in the US since the 1970's

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STUDY	AGENTS	SOCIAL CAPITAL MEASURES	POTENTIAL DETERMINANTS	FINDINGS
Rahn and Rudolph (2002)	Adults in US	Trust in local government	Measures of political institutions, political culture, income inequality, ethnic fractionalization, ideological polarization, controls for individual characteristics	Ideological polarization, income inequality, and political culture are more important and political institutions in explaining variation in trust
Sampson, Morenoff, and Earls (1999)	Adults in Chicago	Intergenerational closure, reciprocal social exchange, and shared expectations for informal social control	Miscellaneous neighborhood characteristics	Residential stability and relative affluence predict intergenerational social closure and reciprocal exchange, whereas neighborhood disadvantage predicts low expectations of shared child control

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