Poverty Reduction and Non-Market Institutions

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Economists in general and development economists in particular have for long been engaged in a debate over the relative strengths and weaknesses of markets and government. One of the most exciting developments in economics during the past twenty years or so has, however, been our increased understanding of non-market institutions (sometimes called "informal" institutions). Progress has been sufficiently great in this research that non-market institutions can be discussed today with a degree of rigour and precision which approaches what economists are used to in their discussions on the performance of markets. The Notes that follow offer a non-technical account of some aspects of what we now know and understand. I am preparing a more complete account in my forthcoming book, Economic Progress and the Idea of Social Capital.

1 Cooperative Ventures

Consider a group of people who have identified a mutually advantageous course of actions. We imagine that they have reached agreement on the allocation of rights and obligations. The agreement could be on the sharing of benefits and burdens associated with the management of a common-property resource (e.g. an irrigation system, a grazing field, a coastal fishery); or it could be on the provision of a public good (e.g. the construction of a drainage channel in a watershed), or on some general collective action (e.g. civic engagement, lobbying); or a transaction in which purchase and delivery of the commodity can't be synchronized (e.g. credit and insurance); or exchanges which amount to reciprocity (I help you, now that you are in need, with the understanding that you will help me when I am in need); and so on. In Figure 1, which depicts a two-person case, the net benefit (payoff) enjoyed by person 1 is measured along the horizontal axis, while that of person 2 is measured along the vertical axis. The curve AC denotes the set of efficient allocations. Regarding the agreement point, I assume for the moment that it lies to the north-east of A. Two possible points are shown in Figure 1: D (which lies on the efficient frontier, AC) and D′ (which lies below AC).

Three questions arise: (a) How have the group come to know one another? (b) As there probably were many other courses of action also available, why did they settle on this particular one? (c) How can the parties feel secure that the agreement will be kept?

The questions are related. The connection between (a) and (c) is obvious. But even (b) and (c) are related: what is agreed upon is unlikely to have been independent of the reasons the parties had for thinking that the agreement would be honoured. Here I am mostly concerned with (a) and (c). The reason for the neglect of (b) is that the theory of bargaining is even now rudimentary. It doesn't offer much guidance on how the benefits and burdens of cooperation would be shared. We should note as well that "benefits" and "burdens" can only be measured in terms of the state of affairs that would prevail in an absence of cooperation. So we have to be clear what that state is. In Figure 1 it has been denoted by A, but the figure doesn't tell us how A is to be interpreted.

It could be that the group comprises people who are only loosely linked. If so, A could denote payoffs the parties would obtain if they continued to be engaged in whatever they currently were doing, say, in employment elsewhere. In this case A would denote the status-quo. Another possibility would be that the group is engaged in what amounts to a Prisoners' Dilemma game. In that case A would denote payoffs which would result if people were to choose their dominant strategies.[1] In more general

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[1] Here is the two-person Prisoners' Dilemma game (the N-person case is a direct generalization). Let U ("unrestrained" behaviour) and R ("restrained" behaviour) be two possible alternatives open to each person. Write by (U, R) the choice of U by individual 1 and R by individual 2, and so on for the remaining three combinations. Imagine that 1 prefers (U, R) to (R, R), (R, R) to (U, U), and (U, U) to (R, U); and that 2 prefers (R, U) to (R, R), (R, R) to (U, U), and (U, U) to (U, R). Clearly U is the dominant strategy for each party: each would most prefer to choose U irrespective of what the other were to choose. So (U, U) is the unique non-cooperative equilibrium pair of choices. But both prefer (R,

circumstances A could simply be a non-cooperative equilibrium of the underlying social situation.

The problem remains that interpreting A doesn't tell us why D should have been chosen. There is of course a temptation to appeal to that old war-horse of cooperative game theory, the Nash bargaining solution, and to identify D as that solution.[2] But excepting for one (Chopra, Kadekodi and Murty, 1990), I don't know of any study which has used it to interpret sharing arrangements in poor countries. The Nash bargaining solution (like other cooperative solution concepts) is independent of the context in which negotiation is assumed to take place. Nash (1950) regarded this as a virtue and was explicit on the point. But this feature of the solution makes it all the more likely that it doesn't often find application.[3]

It is frequently not even possible to judge if the agreement point is efficient (e.g. if in Figure 1 D lies on AC, or if it lies to the left of it, say, the point D′). For this reason, social scientists tend to study cooperative allocations qualitatively. Asymmetries in distributions are traced to differences in the parties' circumstances, while symmetries are traced to their similarities. For example, in her work on collectively-managed irrigation systems in Nepal, Ostrom (1990, 1996) has accounted for differences in rights and responsibilities among users (who gets how much water and when, who is responsible for which maintenance task of the canal system, and so forth) in terms of such facts as that some farmers are head-enders while others are tail-enders. Head-enders have a built-in advantage, in that they can prevent tail-enders from receiving water. Without cooperation their fortunes would differ greatly. So cooperative arrangements display asymmetries. In fact a general finding from studies on the management of common property systems is that entitlements to products of the commons is and was almost always based on private holdings. They thus reflect inequalities in private wealth (McKean, 1992).

Gaspart et al. (1997) have studied a central drainage channel in the Ethiopian highlands. They found that those households having more to gain from the collective endeavour (e.g. those owning more land, or owning land centrally located in the basin) contributed more labour to its construction. This is another example of a built-in asymmetry, giving rise to an asymmetric outcome. On the other hand,

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R) to (U, U). Hence the dilemma.

[2] In the figure, W_1 and W_2 denote the payoffs of persons 1 and 2, respectively. $_1$ and $_2$ are their reservation values. The Nash bargaining solution is that point on BC at which the function $(W_1-_1)(W_2-_2)$ is maximized. For accounts of the Nash bargaining solution, see Fudenberg and Tirole (1991).

[3] Over the past several millenia a wide variety of contextual solutions have been proposed for the problem of dividing an "object" among claimants. See Young (1994) for an account.

If the number of parties were more than two, matters would be especially problematic: every bilateral negotiation would now have to be sensitive to the remaining parties. In addition to the Nash bargaining solution, there are other solution concepts in cooperative game theory, such as the core, the nucleolus, and the Shapley value (see Aumann, 1987, for a review). I have not seen any of them being used in applied studies on the local commons.

Baland and Platteau (1996) have collated examples where communities practise systems of rotation among users of heterogeneous common-property resources, such as inland and coastal fisheries, grazing land, and sources of fuel-wood and fodder. Rotation enables community members to have equal access to the resource over the long run, a sensible allocation rule for similarly-placed actors.

2 Creating Social Networks

In all this I have taken it that people get to interact with one another without having to search for trading partners. But as search requires resources, we need to study pathways by which networks themselves get formed.

One may think of social networks as systems of communication channels, protecting and promoting personal relationships. This is a wide notion. It covers as tightly-knit a network as a nuclear family and one as extensive as a voluntary organization. We are born into certain networks and enter new ones. So networks are themselves connected to one another. Network connections can also be expressed in terms of channels, although a decision to establish channels which link networks could be a collective one.

An elementary channel connects a pair of individuals directly. But one can establish indirect links. A builds an elementary channel connecting her to B, C builds an elementary channel connecting him to B, and so forth. A is then connected to C, albeit once removed. Indeed C's motive for establishing an elementary channel with B could be because of his desire to be linked to A. And so on.

To establish a channel involves costs (e.g. time), as it does to maintain it. In some contexts they would be called by the suitably vague term, "transaction" costs (Coase, 1960). The desire to join a network on someone's part could be because of a shared value.[4] Networks also play a role in enabling coalitions to form and act, a matter central to Putnam's (1993) view of civic engagement. Generally speaking, the decision to invest in a channel could be because it would contribute directly to one's well-being (e.g. investing in friendship) or it could be because it makes economic sense (e.g. joining a guild), or it could be because of both (e.g. entering marriage). On occasion the time involved is not a cost at all, as the act of trying to create a channel can itself be pleasurable. One imagines that many of the benefits and costs of joining a network and continuing one's membership are unanticipated. The immediate motivation could be direct pleasure (e.g. enjoyment in relating to someone or being a member of a congenial group), its economic benefits an unanticipated side-effect. But the direction could go the other way (e.g. joining a firm and subsequently making friends among colleagues). Regardless of the motivation, expenditure in a channel involves a resource allocation problem, with all its attendent difficulties.

The clause "personal relationships" in the notion of networks is central. It involves trust without

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[4] Fukuyama (1997, Lecture 2) takes this to be the defining characteristic: "A network is a group of individual agents that share underlined informal norms or values beyond those necessary for market transactions."

recourse to third-party engagement.[5] There is also the suggestion we noted earlier, that the practice of civic cooperation leads to a heightened disposition to cooperate. It amounts to forming personal taste by sampling experiences. But if social engagement fosters trust and cooperation, there would be synergy between civic engagement and a disposition to be so engaged. The synergy would be tempered by the fact that the private cost of additional engagements (e.g. time) would rise with increasing engagements.[6]

As elsewhere in resource allocation theory, it helps to think first of networks in equilibrium and to then study their dynamics. We may take it that each person has available to him a set of channels from which he can choose. Some would have been inherited (the decision problem concerning these would be whether to maintain them and, if so, at what level of activity), others he would have to create. Imagine that for any configuration of channels that others select, there is an optimal set of channels for each individual. An equilibrium network of channels is then a feasible network possessing the property that each party's choice of channels in the network is optimal for him, given that others establish their respective channels in the network in question. Equilibrium networks can be expected to contain strategically-placed individuals. They are the fortunate people, having inherited and (or) having made the most valuable connections, in a literal sense. There would be others with connections of not much economic worth, even if their emotional worth were high.[7]

Installing channels is a way to create trust. Plausibly, someone's knowledge of someone else' character declines with the number of elementary channels separating them, as in perhaps knowing very little personally about a friend of a friend of a friend, knowing rather more about a friend of a friend, and knowing even more about a friend.[8] This creates the necessary tension between the benefits and costs of establishing elementary channels. But one can be misled by this chain-postulate into thinking that weak ties are not valuable. In fact they can be extremely valuable. In a famous report based on interviews with professional and technical workers in a town outside Cambridge, Massachusetts, Granovetter (1973, 1974) revealed that more than half had found their jobs through a personal connection. Surprisingly, the majority of personal connections weren't close friends, they were mere acquaintances.

On reflection, the latter finding should have been expected. The reason weak ties are especially useful in job search is that they cover a greater range of links than strong ties do. Weak ties connect one

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[5] Compare Putnam (1993: 171): "Social trust in complex modern settings can arise from two related sources - norms of reciprocity and networks of civic engagement".

[6] Putnam (1993: 86-91) discusses this influence. He even suggests (p.90) that "taking part in a choral society or a bird-watching club can teach self-discipline and an appreciation for the joys of successful collaboration."

[7] Boorman (1974) and Bala and Goyal (1997) are formal studies of equilibrium networks.

[8] Compare this account with Putnam (1993: 168-9): "Mutual trust is lent. Social networks allow trust to become transitive and spread: I trust you, because I trust her and she assures me that she trusts you."

to a wide <u>variety</u> of people, and thereby to a wider information base.[9] However, among rural populations in poor countries there are few weak ties, ties are mostly intense. This narrows possibilities. But it creates an avenue for migration. An enterprising member of the community moves to the city. He is followed by others in a chain-like fashion, as information is sent home of job prospects. Migrant workers may even recommend village relations to their bosses, employing whom would reduce a moral hazard problem for employers. This would explain the still largely anecdotal evidence that city mills often employ disproportionate numbers of workers from the same village. The emotional costs of adaptation to new surroundings would also be lower for later migrants, which imply that migration in response to new opportunities in the city should be expected to be slow to begin with but would pick up strength as costs decline (Carrington, Detragiache and Vishwanath, 1996). Formal evidence of chain migration, though sparse, does exist. Caldwell (1969) has confirmed its occurence in sub-Saharan Africa and B. Banerjee (1983) has provided evidence from an Indian sample.

Wintrobe (1995) postulates that parents invest in channels and pass them on to their children in return for security in old age. This probably has had force in poor countries, where capital markets are largely unavailable to rural households. But there is a lot more in our desire to transfer capital assets to the young. One type of capital we give our offspring in abundance is what falls broadly under the term "cultural values". Why? It can be argued that we imbue our children with values we cherish not merely because we think it is good for <u>them</u>, but also because we desire to see our values survive. Our descendents do something supremely important for us: they add a certain value to our lives our mortality would otherwise deprive them of. Procreation itself is a means of making one's values durable. So there are reasons other than intergenerational exchange why we invest in channels and pass them on to our children.[10]

Wintrobe (1995) also asks the interesting question why social networks frequently operate along ethnic lines and why they are multi-purpose and dense, unlike professional networks. In answer he observes that exit from and entry into ethnic networks are impossible, and that the threat of sanctions by the group prevents children from renaging on the implicit contract to work within it. We have seen how the theory of linked games among overlapping generations gives substance to this mechanism.

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[9] For an elegant exposition of this fact, in the form of a profile of an acquaintence of the writer, see Gladwell (1999). Mortensen and Vishwanath (1994) provide a theory of how even salaries depend on whom one knows.

[10] Alexander Herzen's remark, that human development is a kind of chronological unfairness, since those who live later profit from the labour of their predecessors without paying the same price, and Kant's view, that it is disconcerting that earlier generations should carry their burdens only for the sake of the later ones, and that only the last should have the good fortune to dwell in the completed building, or in other words, the thought that we can do something for posterity but it can do nothing for us (see Rawls, 1972: 291), is a reflection of an extreme form of alienation: alienation from one's own life. These matters are discussed in greater detail in Dasgupta (1994).

But there are probably additional forces at work. It shouldn't be surprising that the channels people bequeath to their children in traditional societies frequently amount to ethnic networks (who else is there with whom one can form connections?). But while it is true that exit from one's ethnicity is literally impossible, children do have a choice of not using the ethnic channels they may have inherited. So Wintrobe's thesis needs to be extended if we are to explain why those particular networks are so active, their mere denseness would probably not suffice. The way to do it is to observe first that investment in channels is irreversible: one can't costlessly re-direct channels once they have been established. Moreover, if trust begets trust, the cost of maintaining a channel would decline with repeated use (witness that we take our closest friends and relatives often for granted). So using a channel gives rise to an externality over time (much as in "learning by doing" in the field of technology-use).[11] The benefits of creating new channels are therefore low if one has inherited a rich network of relationships. This is another way of saying that the cost of not using inherited channels is high. Outside opportunities have to be especially good before one severs inherited links. It explains why we maintain so many of the channels we have inherited from our family and kinship, and why norms of conduct pass down the generations. We are, so to speak, locked-in from birth.[12]

The establishment and maintenance of channels create externalities not only across time, but also among contemporaries. If the externalities are positive, as in the case of making friends (or becoming literate and numerate as a prelude to enjoying advanced communication links), there would typically be an undersupply. Diamond (1982) famously showed this in the context of people seeking those others with whom they would be able to exchange goods they have produced. Since one may run into people who haven't got appropriate goods to exchange, search is costly. When someone with goods searches more intensively, she benefits because she is more likely to find someone with whom to trade. But she also benefits those others who possess goods that are appropriate for exchanges with her because they are more likely to run into her. Simulations suggest that such externalities can have powerful effects. Diamond's purpose in constructing the model was to show how an economy could find itself in a depression if transactions involve search. People would produce little if they thought they had to wait a long while before being able to sell (maintaining inventories is costly). It could even be a self-

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[11] Solow (1997) contains a discussion of the dynamics of a macroeconomy when technological change involves learning-by-doing. For a study of the evolving structure of an industry in which firms experience learning-by-doing, see Dasgupta and Stiglitz (1988).

[12] Such lock-in effect isn't unique to social capital of course. In a well-known study in economic history, David (1976) argued that the reason the mechanical reaper took time to be introduced in England was the character of her rural landscape in the mid-19th century. David noted that individual fields in some parts were separated by hedgegrows; in others the terrain was interspersed with irrigation trenches and water-cuts. These were installed physical capital. They had served, and were continuing to serve, a purpose, but they did make the use of the mechanical reaper overly expensive at the level of the individual farmer.

fulfilling thought. If so, equilibrium production and search would both be less than efficient.[13]

There can also be negative externalities in the creation of channels, such as those between members of hostile groups. One would expect an oversupply of them.[14] But be they positive or negative, externalities give rise to collective inefficiency. Positive externalities point to an argument for public subsidy, negative ones for investment in such institutions as those whose presence would detract from them ("taxing" them would be another possibility). Local authorities frequently apply this argument when establishing youth centres, social clubs, and the like.

There are types of influence that are able to travel great distances, for example, via television, newspaper, and the internet. They would be expected to push society toward greater homogeneity of individual projects and purposes. Of course, local influences can have this effect too, as in simple models of contagion (see especially Ellison, 1993). We remarked on this earlier. Whether contagions spread or are geographically contained appears to be sensitive to model specification. The models are nevertheless united in one thing: they all tell us that channels of communication create twin pressures, one leading to clusters of attitudes and behaviour, the other to homogeneity. These pressures work on different, criss-crossing spheres of our lives. Both in turn interact with markets.

Network formation is a very difficult subject. One expects that people often have only a hazy notion of what constitutes a productive channel. Moreover, the dynamics of even the simplest constructs are non-linear. So it isn't evident if the system self-organizes into an equilibrium structure, nor what the structure looks like if it does organize by itself. Explorations in cellular automata have proved to be so inconclusive as to leave one bemused. The literature on the economics of search (for jobs, for bargains, for exchanges generally), on the other hand, has identified tractable models (e.g. Diamond, 1982), as has the literature on simple contagion models mentioned earlier. They affirm that social environments which harbour equilibria can possess multiple equilibria and that the equilibria aren't necessarily efficient or just.[15] The trust game would appear to be canonical. We have seen repeatedly that it can be interpreted in many ways.

Locally interacting systems are of obvious interest for an understanding of many of the social networks we observe. They capture the fact that elementary channels are not public goods. The creation of a channel by someone gives rise to externalities, but they are local externalities. Likewise, the creation of trust gives rise to externalities, but they too are local externalities. Moreover, the

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[13] Formally, Diamond's model is identical to our trust game with only one type of person in the population, not two.

[14] In his analysis of the Sicilian Mafia, Gambetta (1993) studies the character of such negative externalities.

[15] Bala and Goyal (1997) have constructed an ingenious example of a network equilibrium that is both unique and collectively efficient. As would be expected, the model has many special features.

externalities are not anonymous, they are personalized. Names matter. In this sense also they differ from public goods.

Burt (1992) and Burt, Hogarth and Michaud (1998) have found among business firms in the United States that controlling for age, education and experience, employees enjoying strategic positions in social networks are more highly compensated than those who are not. Their findings confirm that at least some of the returns from investment in network creation are captured by the investor. The findings also imply that memberships in networks are a component of what economists call "human capital". The point is that if firms pay employees on the basis of what they contribute to profitability, they would look not only at the conventional human capital employees bring with them (e.g. education, experience, personality), but also the personal contacts they possess. In their important work on human-capital formation in the United States, Jorgenson and Fraumeni (1989, 1992a,b) estimated that the country's stock of human capital is more than ten times as large as her stock of marketable physical capital. They also found that investment in human capital is more than five times as great as investment in marketable physical capital. The Jorgenson-Fraumeni estimates of human capital include in them the privately captured reward for the accumulation of network capital. It would be informative to untangle network capital from the rest of human capital. This could reveal the extent to which returns from network investment are captured by the investor. But measurement problems abound. They may be insurmountable precisely because of the pervasive externalities.

3 If They Are Made, Why Are Agreements Kept?

Assuming then that an agreement has been reached, how can the parties be sanguine that it will be kept? Broadly speaking, there would appear to be three types of situation where parties to an agreement could expect everyone to keep to their side of the bargain: (1) there is an external enforcer, (2) people are honourable, and (3) recourse is taken to mutual enforcement.[16]

In practice the three situations would be expected to shade into one another. Moreover, it can often prove difficult empirically to distinguish between them. For example, someone employed by the parties to act as a referee, or coordinator, or information transmitter can easily appear to an outsider to be in overall authority. Nevertheless, for the sake of clarity, I am going to treat the three as being distinct.

3.1 External Enforcement

It could be that the agreement is translated into an explicit contract and enforced by an

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[16] Of course, none may work in a particular context, in which case people will find themselves in a hole they cannot easily get out of, and what could have been mutually beneficial agreements will not take place. The behaviour reported in the Mezzogiorno by Banfield (1958) is an illustration of this possibility. Ostrom (1990, 1996) and Baland and Platteau (1996) cite a number of cases where cooperative arrangements haven't been entered into, or have broken down. We will return to such matters later in the essay. Sen (1977) calls failure to cooperate the consequence of people being "rational fools".

established structure of power and authority; which is to say that the agreement is enforced by a "third" party. This may be the State, as in the case of contracts in the large numbers of markets operating throughout the world. But it need not be the State. In rural communities, for example, the structure of power and authority are in some cases vested in tribal elders (as in nomadic tribes in sub-Saharan Africa), in others in dominant landowners, feudal lords, chieftains, and priests.

On occasion there are attempts to make rural communities mini-republics in certain spheres of life. Village Panchayats in India try to assume that form. The idea is to elect offices, the officials being entrusted with the power to settle disputes, enforce contracts (be they explicit or only tacit), communicate with higher levels of State authority, and so forth. Wade's account of local enforcement of the allocation of benefits and burdens in rural South India describes such a mechanism in detail (Wade, 1988). Forty-one villages were studied, and it was found that downstream villages (those facing a particularly acute scarcity of water) had an elaborate set of rules, enforced by fines, for regulating the use of water from irrigation canals. Most villages had similar arrangements for the use of grazing land. Wade reports that elected village councils (Panchayats) appoint agents who allocate water among different farmers' fields, protect crops from grazing animals, collect levies, and impose fines.[17]

The question why such a structure of authority as may exist is accepted by people is a higher-order one, akin to the question why people accept the authority of the State. The answer is that general acceptance itself is self-enforcing behaviour: when a sufficiently large number of others accept the structure of authority, each has an incentive to accept it, the personal cost of non-compliance (e.g. a stiff jail sentence) being too high. General acceptance is an equilibrium. Contrariwise, when sufficiently large numbers do not accept it (e.g. during tensions leading to riots or civil wars), individual incentives to accept it weaken, and the system can unravel rapidly to an equilibrium characterised by non-acceptance. General acceptance of the structure of authority is held together by its own bootstraps, so to speak (Dasgupta, 1993). This yields the corollary that even if a government backed by the apparatus of the State were viewed by most citizens to be unworthy, it would remain in power if each citizen were to suppose that most others would continue to accept its authority.[18]

For a third-party to enforce agreements it has to be possible publicly to verify if the terms of a contract have been fulfilled. But this can prove costly (as is confirmed by the enormous costs, relative to incomes, that litigations involve even in modern industrial societies); in some cases it can prove impossible. Because of this and possibly other reasons societies rely also on other mechanisms to

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[17] Baland and Platteau (1996: 217) write about "water masters" in fishing groups in the Niger River delta who regulated the use of the local fisheries.

[18] Models of multiple equilibria of social systems abound. They will be a recurrent theme here. I provide examples below.

facilitate cooperation. We discuss them next.

3.2 Pro-social Disposition

People would trust one another to keep agreements if they were sanguine that most others had a disposition to be trustworthy. Such disposition is to a greater or lesser extent formed through communal living, role modelling, education, and receiving rewards and punishments. The process begins at the earliest stages of our lives.[19] The development of personal morality is related to this, but the two aren't the same. Note too that we not only internalize moral norms, such as that of paying our dues, helping others at some cost to ourselves, and returning a favour, we also practise such norms as those which prescribe that we punish people who have hurt us intentionally; and even such meta-norms as shunning people who break agreements, on occasion frowning on those who socialise with people who have broken agreements, and so forth. By internalizing such norms, a person enables the springs of her actions to include them. She therefore feels shame or guilt in violating the norm, and this prevents her from doing so, or at the very least it puts a break on her, unless other considerations are found by her to be overriding. In short, her upbringing ensures that she has a disposition to obey the norm, be it moral or social. When she does violate it, neither guilt nor shame would typically be absent, but frequently the act will have been rationalized by her. Summarizing a number of studies conducted in the West, Rotter (1980) reported that on average people who are more willing to trust others are themselves more trustworthy, in that they are less likely to lie, cheat, or steal. They are also less likely to be unhappy or maladjusted, and are more liked by friends and colleagues.

Often enough the disposition to be honest would be toward members of some particular group (e.g. one's clan, or neighbours, or ethnic group), not others. This amounts to group loyalty. One may have been raised to be suspicious of people from other groups, one may have even been encouraged to dupe such others if and when the occasion arose. Society as a whole wastes resources when the disposition for honesty is restricted to particular groups. A general disposition to abide by agreements, to be truthful, to be able to trust one another, and to act with justice is an essential lubricant of societies. Theoretical considerations imply that the larger is the population over which this disposition is cast by all, the better is the collective outcome. Landes (1998) offers powerful historical evidence of this. Later we will formulate a model which builds on the idea that communities where civic virtues prevail save on transaction costs. Therein lies the instrumental worth of civic virtues. It explains why mechanisms for the growth of social capital consist in part of establishing pathways by which these virtues could be made to flourish.

In the world as we know it the disposition to be trustworthy at both the personal and impersonal

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[19] Rest (1983), Shantz (1983), Eisenberg and Mussen (1989), Hinde and Groebel (1991), and Coles (1997) contain accounts of what is currently known of the development processes through which people from their infancy acquire prosocial dispositions; for example, by learning to distinguish accidental effects from intentional effects of others' actions.

spheres is present in varying degrees. When we refrain from breaking the law, it is not always because of a fear of being caught. On the other hand, if say, relative to the gravity of the misdemeanour the pecuniary benefits from malfeasance were high, some transgression could be expected to occur. Punishment assumes its role as a deterrence because of the latter fact.

3.3 Mutual Enforcement

However, where people encounter one another repeatedly in similar situations, agreements could be honoured even if people are not disposed to be honest, and even if an external authority is not available to enforce agreements. This mechanism, where people are engaged in long-term relationships, is an ingredient in theories of social capital.[20]

Let us assume then that Figure 1 represents opportunities faced by the various parties in each of an indefinite number of periods. We call the social engagements that are possible in each period the "stage game". Opportunities over time can then be derived from repetitions of this stage game.

Consider now a group of far-sighted people who know one another, who prepare to interact indefinitely with one another under repeated plays of the stage game, and who understand the details of the agreement.[21] By a far-sighted person I mean someone who applies a low rate to discount future costs and benefits of alternative courses of action. This means that the parties in question are not independently mobile (although they could be collectively mobile, as in the case of nomadic societies); otherwise the chance of future encounters with one another would be low and people would discount heavily the future benefits of cooperation.

The basic idea is this: if people are far-sighted, a credible threat by others that they would impose sufficiently stiff sanctions on anyone who broke the agreement would deter everyone from breaking it. The problem is to arrange matters so that the threats in question are credible. This can pose a problem because the character of the agreement can matter, which means that the kind of sanctions which are intended for use to punish transgressors can matter. In the following two sections we study how the basic argument and some of its many generalizations work. It will prove useful to do this by means of examples.

4 The Local Commons

Communitarian systems of management have protected local resources in many places from the tragedy of the commons. Understandably, this fact has influenced writings on social capital (Feeny, et

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[20] The theoretical chapter in Putnam (1993), Chapter 6, makes the connection, but does not develop the formal structure of the mechanism. I give the details below, both for completeness and because I will need the account subsequently. The classic articles on the subject are Friedman (1971), Rubinstein (1979), Fudenberg and Maskin (1986), and Kandori (1993a).

[21] I am not assuming that the parties are bound to meet forever. Rather, I am assuming that no matter how far a date into the future one cares to name, there is some chance that the parties in question will be on hand to be able to cooperate.

al., 1990; Bromley, et al., 1992). So it pays to study the successes and failures of such systems. A great many studies are about management practices in poor countries. So I concentrate on them.

In poor countries the local commons include grazing lands, threshing grounds, swidden fallows, inland and coastal fisheries, rivers, woodlands, forests, village tanks, and ponds. Are they extensive? As a proportion of total assets, their presence ranges widely across ecological zones. In India the local commons are most prominent in arid regions, mountain regions, and unirrigated areas, they are least prominent in humid regions and river valleys (Agarwal and Narayan, 1989). There is an economic rationale for this, based on the human desire to reduce risks. An almost immediate empirical corollary is that income inequalities are less where common-property resources are more prominent. Aggregate income is a different matter though, and it is the arid and mountain regions and unirrigated areas which are the poorest. This needs to be borne in mind when public policy is devised. As would be expected, dependence on common-property resources even within dry regions declines with increasing wealth across households.[22]

Jodha (1986, 1995) studied evidence from over 80 villages in 21 dry districts in India to conclude that, among poor families, the proportion of income based directly on the commons is for the most part in the range 15-25 percent. Moreover, as sources of income, they often complement private-property, which are in the main labour, milch and draft animals, agricultural land, and tools. Common-property resources also provide the rural poor with partial protection in times of unusual economic stress. For landless people they may be the only non-human asset at their disposal. A number of resources (such as fuelwood and water, berries and nuts, medicinal herbs, resin and gum) are the responsibility of women and children.

In a study of 29 villages in south-eastern Zimbabwe, Cavendish (1998, 1999) has arrived at even larger estimates: the proportion of income based directly on the commons is 35 percent, the figure for the poorest quintile being 40 percent. A similar picture emerges from Hecht, Anderson and May (1988), who offered qualitative descriptions of the importance of babassu products among the landless in Maranh o, Brazil. The products offer support to the poorest of the poor, most especially the women among them. They are an important source of cash income in the period between agricultural-crop harvests.[23]

Are the local commons managed? In many cases they are, or have been. They are frequently not open-access resources, but are open only to those having historical rights, through kinship ties, community membership, and so forth. Communitarian management of the commons makes connection with social capital viewed as a complex of interpersonal networks. It hints at the basis upon which

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[22] In his work on South Indian villages, Seabright (1997) has shown that producers' cooperatives, unconnected with the management of local commons, are also more prevalent in the drier districts.

[23] For a similar picture in the West African forest zone, see Falconer (1990).

cooperation has traditionally been built. A large empirical literature has confirmed that resource users in many cases cooperate, on occasion through not undemocratic means.[24]

We noted earlier that the distribution of benefits and burdens in a long term relationship would be expected to depend on how the users would have fared if they hadn't reached an agreement (as in Figure 1). In those cases where users are symmetrically placed, distributions would be expected to be symmetric, a subtle matter to devise if the resource is heterogeneous. Rotation of access to the best site is an example of how this can be achieved. It is practised in coastal fisheries, fuel reserves in forest land, and fodder sites in the grasslands. Rotation enables users to get a fair shake.

But if there are substantial differences among community members in the ownership of private property, entitlements to the products of the commons would be expected to reflect those inequalities.[25] For example, among Kofyar farmers in Nigeria obligatory labour on both communal projects and individual farms is drawn equally from all member households, but this benefits large cultivators disproportionately. It is also all too possible that the relationships are exploitative (as in Figure 2). We noted earlier, for example, that in India, access to the commons is often restricted to the privileged (e.g. caste Hindus), who are also among the bigger landowners. In many parts of the poor world women are systematically excluded from such networks of relationships as those involving credit, insurance, and savings. Rampant inequities exist too in patron-client relationships.

Site-specific information about the local ecology is held by those who work on the commons. Local participatory democracy offers a mechanism by which relevant local knowledge can inform the design of public policy.[26] As women are often the ones to work on the commons, they are an important repository of knowledge. But they are frequently the ones who are shut out of the local political arena. The State apparatus can be helpful here, by enabling women to participate in the democratic process, and by ensuring that local decisions are made in an open way. It would help prevent local economic powers from maintaining control. Good management of the commons requires more than mere local participation, it needs enlightened government (third party) engagement as well.

It is worth distinguishing, once again, between verifiability and observability of actions, and between reaching a collective agreement and ensuring that the agreement is kept. The State may be able to guide the workings of local democracy even when it can't enforce agreements. It would be able to do so if the costs of monitoring participatory democracy at work is low and the costs of verifying that

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[24] Ostrom (1990, ch. 3) and Baland and Platteau (1996, ch. 10) contain much evidence. The former ranges over a number of long-enduring common-property resources in Nepal, the youngest of which has been found to be 100 years old, the oldest more than 1000 years old. The latter contains accounts of not only successful management practices, but also of some where a commons remained unmanaged.

[25] McKean (1992) and Ostrom and Gardner (1993) have stressed this point.

[26] On this see Esman and Uphoff (1984), Wignaraja (1990), Ghai and Vivian (1992), and Ostrom (1992, 1996).

agreements have been broken are high. This tension, the simultaneous need for increased decentralization in rural decision-making and for government involvement in ensuring that the seats of local decisions are not usurped by the powerful, poses a central dilemma in the political economy of rural development. It is a dilemma because of the conflicting nature of underlying incentives: the practice of democratic decision-making at the village level may expose government to a greater pressure to be accountable. But the guardian is itself subject to a problem of incentives. This is where a free, competitive media (namely, the press, radio, and television) have an instrumental role to play.[27]

The local commons matter greatly to the poorest of the rural poor, who happen, generally speaking, to be the landless. When the commons erode, such people are are often at risk of economic disenfranchisement even if the aggregate economy enjoys growth. In recent years this has been documented extensively for the poorest regions of the Indian sub-continent (C.S.E., 1982, 1986; B. Agarwal, 1986). This heightened vulnerability of the poorest, often more real than perceived, is the cause of some of the greatest tragedies in contemporary societies.

Why should the local commons have eroded in those cases where they previously had been managed in a sustained manner? A recent intellectual tradition goes something like this: the reason the poor degrade their local resource base is that their poverty forces them to discount future incomes at unusually high rates (Bardhan, 1996: 62). I don't know of much evidence in support of this. Poverty, in any case, is not a recent phenomenon. If the thesis were correct, the local commons would have disappeared long ago. So I consider a different explanation: low private rates of return from the resource-base owing to the failure of institutions.[28]

There are many ways in which institutional failure manifests itself. Civil wars (more generally, uncertain property rights) are a prime example of course. It doesn't serve much purpose investing in a resource-base if there is a high chance of it being usurped or destroyed by others. In Section 13 we will study a mechanism whereby even the disposition to cooperate weakens as the resource-base becomes more valuable in the wake of economic development. Moreover, cooperation can also break down (or not be initiated) if migration accompanies the development process. As opportunities outside the village improve, those with lesser ties (e.g. young men) are more likely to take advantage of them and make a break with those customary obligations that are enshrined in prevailing social norms. Those with greater attachments would perceive this, and so infer that the expected benefits from complying with

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[27] These matters are discussed more fully in Dasgupta (1993, ch. 17; 1996). See also Bardhan and Mookherjee (1998) for a mathematical formalization of a similar tension. They consider a case where the central government wants to invest in a local project. To permit the locals to make decisions relating to the investment is desirable because many matters of importance are known only locally. But there is a weakness with decentralization, in that local bosses can usurp the local decision-making process.

[28] This thesis has been explored more fully in Dasgupta and Mäler (1991) and Dasgupta (1993, 1996, 1997).

agreements is now lower. Either way, norms of reciprocity could be expected to break down, making certain groups of people (e.g. women and the old) worse off. Earlier I noted this possibility in the context of formal models of long-term relationships. This is a case where improved institutional performance elsewhere (e.g. growth of markets in the economy at large) has an adverse effect on the functioning of a local, non-market institution (Dasgupta and Mäler, 1991; Dasgupta, 1993).

Rapid population growth can itself be a trigger if institutional practices are unable to adapt to changing economic circumstances. In Cote d'Ivoire, for example, growth in rural population has in recent years been accompanied by increased deforestation and to reduced fallows. Biomass production has declined, as has agricultural productivity. Lopez (1998) estimates that income at the village level has declined by some 15 percent.

The local commons also erode because of unreflective public policies. Unhappily, there are also direct causes, such as predatory governments and thieving aristocracies. For example, Binswanger (1991) has shown that in Brazil the exemption from taxation of virtually all agricultural income and the enactment of laws which see logging as proof of land occupancy have provided strong incentives for the rich to acquire and convert forest land. Binswanger argues that the subsidy the government has provided to the private sector to engage in deforestation has been so large, that a reduction in the activity is in Brazil's interests, and not merely in the interest of the rest of the world.[29]

Corrupt practice by rulers is a commonplace. Chambers (1988) has studied institutions governing canal irrigation in South Asia. He discovered that political leaders there have routinely auctioned jobs to irrigation engineers. Many are posts of short tenure. But as they offer a scope for earning illegal income (e.g. from contractors and farmers), they are much in demand. Colchester (1995) has recounted that political representatives of forest-dwellers in Sarawak, Malaysia, have routinely given logging licenses to members of the state legislature. Primary forests in Sarawak are expected to be depleted within the next few years.

Even well-meaning economic aid can prove harmful. In a report on communal irrigation systems in Nepal, Ostrom (1996) observed that originally the canals had consisted of temporary, stone-trees-and-mud headworks, constructed and managed by the farmers themselves. Canal systems that had been improved by the construction of permanent headworks were found frequently to be in worse repair and to be delivering less water to tail-enders than previously. Ostrom also reported that water allocation was more equitable in traditional farm-management systems than in modern systems managed by external agencies, such as government and foreign donors. She has estimated from her sample that agricultural productivity is higher in traditional systems.

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[29] In a wider discussion of the conversion of forests into ranches in the Amazon basin, Schneider (1995) has shown that the construction of roads through the forests has been a potent force. Roads have made forest resources economically more valuable.

Ostrom has an explanation for this. She argues that unless it is accompanied by counter-measures, the construction of permanent headworks alters the relative bargaining positions of the head- and tail-enders. Head-enders now don't need the labour of tail-enders to maintain the canal system. So the new sharing scheme involves even less water for tail-enders. Head-enders gain from the permanent structures, but tail-enders lose disproportionately.[30]

Resource allocation rules practised at the local level are not infrequently overturned by central fiat. A number of States in the Sahel imposed rules which in effect destroyed communal management practices in the forests. Villages ceased to have authority to enforce sanctions on those who violated locally-instituted rules of use. State authority turned the local commons into free-access resources.[31]

All this is to say that resource allocation mechanisms which do not take advantage of dispersed information, which are insensitive to hidden (and often not-so-hidden) economic and ecological interactions, which do not take the long-view, and which do not give a sufficiently large weight to the claims of the poorest within rural populations, are not to be commended. The examples tell us something about the way communitarian solutions to resource allocation problems break down and are displaced by other allocation mechanisms, some of which are worse. But it isn't to say that communitarian management systems are inevitably efficient, nor that they themselves may not delay the appearance of more efficient resource allocation mechanisms. We will study these matters subsequently.

5 Markets and Networks

Earlier I offered a classification of the various pathways by which agreements can be kept. Attention was drawn to third-party enforcement and to mechanisms relying on personal reputation. We noted that impersonal markets are able to function extensively only if agreements can be enforced by a third party. We noted too that a necessary condition for this to be possible is that states of affairs which matter are verifiable. The apparatus of government is relevant here. Impersonal markets (markets for short) can function well only if contracts can be written in detail and the law is impartial and effectively administered. I am thinking of contracts bearing on such matters as the quality of goods and services, delivery date, and hours worked. If the State is weak, or oppressive, or merely corrupt, social networks assume importance in ensuring that agreements are kept. Dense networks help give weight to informal agreements. Inevitably, transactions have to be personalized in such cases.[32]

Social networks are the embodiment of "social capital". A defining feature of networks is that they are personal (members of networks must have names, personalities and attributes). Social networks

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[30] For other examples where projects designed to benefit the recipients of aid have been destructive, see Coward (1985), Chambers (1988) and Ascher and Healy (1990).

[31] See Thomson, Feeny and Oakerson (1986) and Baland and Platteau (1996).

[32] See Gambetta (1993) on this in his discussion of Sicilian society and Rose (1995) on Russian society.

are exclusive, not inclusive, otherwise they would not be social networks. The terms of trade within a network are different from those which prevail across them. An outsider's word is not as good as an insider's word. Names matter. To be sure, the distinction between personalized and impersonal exchanges is not sharp, and even in a sophisticated market (e.g. modern banking), reputation matters (e.g. credit rating of the borrower). But the distinction is real.

Dense networks can be suffocating for members, but networks in general needn't be suffocating. Earlier we noted how networks can be an invaluable source of information, enabling markets to function well. We noted also that networks can be a means by which markets get established (e.g. long distance trade in earlier times). In many cases they are necessary if markets are to function at all. Rauch (1996a,b), for example, has applied the theory of search to study the character of international trade in differentiated products. There are specialized commodities, like footwear, which are traded internationally, but are not traded in organized markets, nor do they have reference prices listed for them. Why? Rauch observes that there are so many fine differences in the characteristics of footwear that a price observed at one location offers little information about the commodity's worth at any other location. So, traders search for buyers and sellers with a view to finding a good match. In this search proximity is a help, as is common language, which imply that an important effect of immigration on trade would be through the establishment of business contacts (Gould, 1994). Evidence from the OECD countries is consistent with these observations.[33]

All societies rely on a mix of impersonal markets and communitarian institutions. The mix shifts through changing circumstances, as people find ways of circumventing difficulties in realizing mutually beneficial transactions. The transmission and retrieval of knowledge affords an illustration, albeit an extreme one. In pre-literate societies an important role of social capital was the transmission of knowledge (e.g. a society's history). The elderly were particularly valued as repositories of wisdom (Goody, 1986). Today, both transmission and retrieval are in large measure a private act, not a collective endeavour.[34]

In an oft-quoted passage, Arrow (1974: 33) expressed the view that organizations are a means of achieving the benefits of collective action in situations in which the price system fails. This formulation, if interpreted literally, gets the historical chronology backward; but it has an important converse: certain types of organization can prevent markets (and thereby an effective price system) from coming into existence. Earlier we noted that when markets displace communitarian institutions in the

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[33] For a more general investigation into the role of personal contacts in the geographic distribution of trade, see Egan and Mody (1992).

[34] Manguel (1997) interprets the evolution of reading in these terms. Johann Gutenberg's printing of the Bible by movable type is justifiably regarded as an event of the greatest importance (Landes, 1998: 51-52).

production of goods and services, there are people who suffer unless counter-measures are undertaken. I am talking now of the other side of the coin: communitarian institutions can prevent markets from functioning well; in extreme cases they can prevent the emergence of markets. When they do, communitarian institutions are a hindrance, not an engine of economic development. They may have served a purpose once, but they are now dysfunctional.

The key point is that the links between markets and communitarian institutions are shot through with externalities. Transactions in one institution have effects which spill over to the other without being accounted for. Kranton (1996) studies this. She begins by observing that to be engaged in market transactions can involve search. As we noted earlier, search gives rise to externalities: if a person increases her search, others benefit, in that their search costs decline. So, if people are largely involved in communitarian institutions (e.g. if they transact on the basis of norms of reciprocity), private incentives to enter markets are low owing to high search costs. But it could be that the market has the potential to offer a greater range of goods and services and is, in fact, the superior institution of production and exchange. Kranton shows that if, for whatever reason, there are insufficient numbers of people entering markets, communitarian institutions could not only survive, but keep the more efficient institution from coming into being. This would be a collective loss.

Externalities introduce a wedge between private and social costs, and between private and social benefits. Repeatedly in this essay we have seen how equilibrium behaviour can yield inefficient outcomes in the presence of externalities. That individuals are able to explain their actions as being in their own best interest doesn't imply that the institution in which they operate is defendable. They themselves may find the institution undefendable if they were to recognise its underlying mechanism for translating choices into consequences. So too with dysfunctional norms of behaviour. Such practices as female circumcision are frequently packaged as "cultural values" for the benefit of outsiders, a sure way to forestall critical enquiry into them. These simple truths are easy to overlook, but have wide ramifications for the way we should perceive our own institutions and those of other places and other times.

Consider, for example, that the parental costs of procreation are low when the cost of rearing children is shared among the kinship. In sub-Saharan Africa, fosterage within the kinship is a commonplace: children are not raised solely by their parents, the responsibility is more diffuse within the kinship group (E. Goody, 1982; Caldwell, 1991; Bledsoe, 1994). Fosterage in the African context is not adoption. It is not intended to, nor does it in fact, break ties between parents and children. The institution would seem to afford a form of mutual insurance protection. There is some evidence that, as savings opportunities are few in the low-productivity agricultural regions of sub-Saharan Africa, fosterage also enables households to smoothen their consumption across time.[35] In parts of West Africa

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[35] This latter motivation has been explored by Serra (1997).

upto half the children have been found to be living with their kin at any given time. Nephews and nieces have the same rights of accomodation and support as do biological offspring. There is a sense in which children are seen as common-responsibility.

All this sounds good. Unfortunately, the arrangement creates a free-rider problem if the parents' share of the benefits from having children exceeds their share of the costs (Dasgupta, 1993, 1995). From the point of view of the parents, taken as a collective, too many children would be produced in these circumstances. Related to this is a phenomenon noted by Guyer (1994) in a Yaruba area of Nigeria. In the face of deteriorating economic circumstances, some women have been bearing children by different men so as to create immediate lateral links with them. Polyandrous motherhood enables women to have access to more than one resource network.

If we view the networks which enable these social practices to exist as risk-sharing arrangements and consumption-smoothening devices, they are to the good. But they are not <u>all</u> to the good, because their presence lowers the benefits to people of transacting in insurance and capital markets when such markets appear on the scene. The benefit would be even lower if the emotional costs of moving from one system to another were included (economists would call this a "stock effect"). Admittedly, like capital markets, insurance markets suffer from many imperfections. Of central importance is the imperfection that arises from the moral hazard to which commercial firms are subject (it is difficult for firms to monitor the extent to which the insured have taken precautions against accidents). But one great advantage of insurance markets is that they are able to pool more risk than communitarian insurance schemes are able to. In this sense at least, they are superior to fosterage and polyandrous motherhood. However, mutual insurance among members of a community (e.g. household, kinship, village) can be expected to be less fraught with problems of moral hazard. If it <u>is</u> less fraught, people would have an incentive to take out insurance in both institutions. But to the extent people take part in communitarian insurance arrangements, markets are "crowded out". This is an externality, and markets would be excessively crowded out if even communitarian institutions suffer from some moral hazard (Arnott and Stiglitz, 1991). In any event, there is a collective loss unless judicious government policies are put in place. One concludes that past accumulation of certain kinds of social capital can act as a drag on economic development, by preventing more efficient institutions from spreading.

The point then is this. Social networks can be a help or a hindrance, it all depends on the uses to which networks are put. It also depends on the state of technology. Networks can offer powerful aid to the good functioning of markets when they are used for transmiting information, both among network members and between members and non-members. In such cases networks and markets are complementary in their roles.[36] However, networks can be destructively competitive with markets if they

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[36] Even here, the role of networks can be expected to diminish as it becomes easier and easier to

are involved in the production and exchange of "marketable" goods through communitarian arrangements, such as those which operate on the basis of norms of reciprocity.

The growth of impersonal markets would seem to be necessary for long-run improvements in the standard of living. Both theory and empirics testify to this (Adelman and Morris, 1967; Dasgupta, 1993; Landes, 1998). The reason has been familiar since Adam Smith: transactions limited to a group are likely to be less productive than those which can involve the entire population. Standardisation of products enables unit costs of production to decline with the volume of output. Standardisation is, of course, also intimately connected with the growth of markets. In addition, it is possible to show theoretically that the more dissimilar are transactors, the greater are the potential gains from transaction. To the extent associations are a dense network of engagements, they are like economic enclaves. But if associations act as enclaves, they retard economic development. For example, social impediments to the mobility of labour imply that "talents" aren't able to find their ideal locations. This can act as a drag on technological progress (Galor and Tsiddon, 1997). More generally, resources which should ideally flow across enclaves do not do so. It is a source of inefficiency.

6 Macro-evidence: Scale vs. Change

So far I have adopted a micro-economic perspective. How does the analysis translate into the macroeconomy? In a review of Fukuyama (1995), Solow (1995) observed that if social capital is to be treated on par with other types of capital, it had better show up in the statistics of growth accounting. To illustrate, consider the simplest formulation of economy-wide production possibilities. Let K and L, respectively, denote an economy's stock of physical capital and labour-hours employed and suppose that production possibilities of aggregate output, Y, are given by the functional relation,

$$Y = AF(K,L), \quad \text{where } A > 0. \tag{1}$$

We will suppose that F satisfies those properties which would enable textbook resource allocation theory to run smoothly.[37]

In equation (1) A is the scale factor of the production function. Economists refer to it as the "total factor productivity" of the economy and regard it as a combined index of institutional capabilities and publicly-shared knowledge. However, for reasons I will suggest below, economists haven't tried to develop independent ways of measuring total factor productivity. Instead, as Solow (1995) remarks, a standard exercize in the economics of development has been to decompose the observed change in output of an economy into its sources: How much can be attributed to the change in labour-force

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transmit and access information in the market place.

[37] Such as that F is constant-returns-to-scale in K and L, that it is an increasing function of K and L, and that it increases at diminishing rates. I am ignoring environmental capital because there are no systematic international time series of it. I have also suppressed time subscripts from Y, A, K, and L.

participation, changes in population size, net accumulation of physical capital, and so on. If some part of observed change in output can't be credited to any measured factor of production, economists call it the "residual". We now use equation (1) to obtain growth accounts.

To do this, differentiate both sides of the equation with respect to time to obtain:

$$d(\ln Y)/dt = [AKF_K/Y]d(\ln K)/dt + [ALF_L/Y]d(\ln L)/dt + d(\ln A)/dt.^{38} \qquad (2)$$

Equation (2) is useful because it decomposes the change in gross national product (the left-hand side) into three components: (i) the contribution of the change in the stock of physical capital (the first term on the right-hand side), (ii) the contribution of the change in the quantity of labour hours in production (the second term), and (iii) the contribution of the change in total factor productivity (the third term) or, in other words, the residual.[39] Solow (1995) remarked that if social capital has bite as a concept, it would show up in international time series as a residual.

In fact it doesn't. The contribution of the residual to the phenomenal economic growth of East Asian countries in recent years has been negligible; the first two terms on the right-hand side of equation (2) explain almost all the growth that has been enjoyed there since the 1960s.[40] And yet East Asian societies are widely viewed as being rich in precisely the kinds of social capital that would have helped foster economic growth. How is this to be explained?

The question occurs in less aggregated data as well. We noted earlier that in his analysis of statistics from the 20 administrative regions of Italy, Putnam (1993) found civic tradition to be a strong predictor of contemporary economic indicators. He showed that indices of civic engagement in the early years of this century were highly correlated with employment, income, and infant survival in the early 1970s. He also found that regional differences in civic engagement can be traced back several centuries and that, controlling for civic traditions, indices of industrialization and public health have no impact on current civic engagement. As he put it, the causal link appears to be from civics to economics, not the other way round.[41]

The same question appears, albeit indirectly, in even less aggregated data. Narayan and Pritchett (1997) have analysed statistics on household expenditure and social engagements in a sample of over 50 villages in Tanzania, to discover that indices of village-level social capital (viz. memberships in village-

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[38] "lnY" denotes the logarithm of Y, and so forth. F_K is the partial derivative of F with respect to K, and so on.

[39] Change here refers to the percentage rate of change.

[40] The key papers on this are Kim and Lau (1992) and A. Young (1993). Rodrik (1997) contains a good commentary.

[41] See also Helliwell and Putnam (1995). But see Knack and Keefer (1997), who have found no association between memberships in formal groups and trust and improved economic performance in their sample of countries.

level associations) are strongly associated with mean household expenditure. They have also provided statistical reasons for arguing that more social capital results in higher household expenditure rather than the other way round.

The residual doesn't appear in any of these cross-section studies. I will now argue that it isn't necessary for it to do so.

Consider two communities, labelled i = 1, 2. To make the analytical points I want to make here in a sharp way, we will suppose that in both communities there is a single, all-purpose, non-deteriorating commodity which can be either consumed or set aside as saving. Let us continue to imagine that there is only one kind of labour.[42] Finally, suppose that both communities are autarkic and operate with the same body of technical knowledge concerning the ways labour and physical capital can be combined to produce output. This means that any difference in the total factor productivity of the two economies would be due entirely to differences in their institutional capabilities. For the moment let us call the latter "social capital".

Let the stock of physical capital and labour in i be K_i and L_i. We use the notation in equation (1) to denote aggregate output, Y_i, by the functional relation,

$$Y_i = A_i F(K_i, L_i), \quad \text{where } A_i \, (> 0); \qquad i = 1, 2. \tag{3}$$

There are any number of micro-economic accounts which could be provided for this formulation. For example, the social structure underlying the trust game (Tables 1-2) could give rise to the aggregate production function in equation (3). So could the more general model involving quasi-voluntary compliance account for it. For example, if civic cooperation were to increase in community i (e.g. due to a shift from a low compliance to a high compliance equilibrium owing to changes in population-wide expectations), it would translate into a higher value of A_i. But this would mean that the same quantities of physical capital and labour-hours would combine to produce more output, because greater trust and trustworthiness makes possible a more efficient allocation of resources in production.

By the same token, if civic cooperation were greater among people in community 1 than in community 2, we would have $A_1 > A_2$. If they possessed identical amounts of physical capital and identical quantities of labour, community 1's output would be larger than community 2's output. An observer would discover a positive association between a community's "social capital" (i.e. total factor productivity) and its mean household income. This is one way to interpret the finding reported in Narayan and Pritchett (1997).

Consider now a different thought-experiment. Imagine that in year 1900 the two communities had been identical in all respects but for their social capital, of which community 1 had more (i.e. $A_1 > A_2$ in 1900). Imagine next that since 1900 total factor productivity has remained constant in both

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[42] The reason I am postulating an all-purpose commodity and a single kind of labour at this point is that I want to avoid aggregation problems. See below for elaboration.

communities. Suppose that people in both places have followed a simple saving rule: a constant fraction, s (> 0), of aggregate output has been invested each year in accumulating physical capital. In order to make the comparison easy, suppose finally that the communities have remained identical in their demographic features. It is then a simple matter to confirm that in year 1970 community 1 would be richer than community 2 in terms of consumption, output, and physical wealth. Note though that the residual in the time series of growth accounts in both communities would be nil ($dA_i/dt = 0$, for i = 1, 2).

We can reinforce the story. The presumption that the two communities have saved at the same rate is unsatisfactory. To see why, it will be noticed from equation (3) that in 1900 the marginal product of physical capital would have been higher in community 1. This would suggest that the private rate of return on investment in physical capital was higher in community 1 in that year.[43] But this would have provided people in community 1 a reason for investing a greater fraction of their incomes than those in community 2, thereby spurring 1's growth rate even more. By 1970 the economic disparity between the two communities would have been even greater. I conclude that an absence of a residual in growth accounts doesn't mean that social capital has not had an influence on the macroeconomy.

As the communities are both autarkic, there is no flow of physical capital from the one to the other. This is an economic distortion for the combined communities: the rates of return on investment in physical capital in the two places remain unequal. The source of the distortion is the enclave nature of the communities, occasioned in our example by an absence of markets linking them. There would be gains to be enjoyed if physical capital could flow from community 2 to community 1.

Autarky is an extreme assumption, but it isn't a misleading assumption. What the model points to is that, to the extent social capital is exclusive, it inhibits the flow of resources, in this case a movement of physical capital from one place to the other. Put the other way, if impersonal markets don't function well, capital does not flow from community 2 to community 1 to the extent it ideally should. Social networks within each community block the growth of markets, so their presence inhibits economic development. That is the moral to be drawn.

7 Measuring Social Capital

Is it reasonable to model the externalities generated by social networks as total factor productivity, or should social capital be regarded on par with physical, environmental, and human capital as factors of production? In either case, how should it be measured?

Earlier, we noted that if the market for labour and skills works reasonably well, wages and

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[43] If markets in each community were perfectly competitive, the private rate of return on investment in physical capital would equal the marginal product of physical capital. Since we are discussing the importance of social capital in production, I am, of course, assuming that markets are vastly imperfect in each community. What I am assuming though is that they are similarly imperfect, in the sense that differences in the marginal products of physical capital in the two communities translate into differences in their private rates of returns on investment in physical capital. This is a weak assumption to make.

salaries would in part consist of the profits employees make for their employers by virtue of the "contacts" they possess (Burt, 1992). Therefore, to the extent the social worth of such contacts are reflected in wages and salaries, social capital is a part of measurable human capital, which means that it can be thought of as a privately-owned factor of production.[44] But we also noted that social networks involve externalities, which typically would not be reflected in wages and salaries. So then, how is one to measure the externalities?

We have already considered one possibility. Two others suggest themselves. First, we could entertain the eminently sensible suggestion that labour involves not only time (and effort), but also skill, or in other words, it involves human capital. We could then imagine that aggregate output (Y) is a function of labour hours (L) and a composite index of capital which includes both physical and human capital (K and H, respectively). Let the composite index of capital be BM(K, H), where B is a scale factor and M is an increasing function of K and H. Then, in place of equation (1), we would have

$$Y = AF(BM(K, H), L), \text{ where } A, B > 0. \quad\quad\quad (4)$$

In this formulation, B captures social-network externalities.

Lau (1996) reports on a series of studies which have specified the aggregate production function to be of the form $Y_t = F(B_t K_t^a H_t^{(1-a)}, L_t)$, where $0 < a < 1$. In its form this is a special case of equation (4). The studies have uncovered that, since the end of the Second World-War, the contribution of B_t to growth in Y_t in today's newly industrialized countries has been negligible.

However, following the studies he was reporting, Lau interpreted B to be the economy's knowledge base, not social network externalities. A stagnant B in that interpretation would mean an absence of technological change, which the studies attempted to show has been the case in East Asia since the end of the Second World-War. Here we are considering the idea that B could as well represent social-network externalities. Let us see how it would work.

Consider once again two autarkic communities (i = 1, 2). Suppose B is constant in both places and $B_1 > B_2$. Then it must be that $H_1 > H_2$, since, by definition, a worker's human capital includes the social networks to which she belongs. If L and K were the same in the two communities in some base year, Y_1 would have exceeded Y_2 in that year. If L were to remain constant in both places and the savings rates in the two were the same, accumulation of physical capital would be greater in community 1, which in turn means that the standard of living would be higher. All this, even although time series would show that the "residual" (be it dA_t/dt or dB_t/dt) in both communities was zero. Interestingly, in the base year the marginal product of physical capital in community 1 would have been lower than in community 2, which means that, ideally, physical capital ought to have moved from 1 to 2, and it would have moved had there been perfect capital markets.

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[44] However, unlike physical capital, human capital is non-transferable, it is person-specific.

A second alternative for modelling social networks would be to construct a composite index of labour, which includes not only labour-hours, L, but also the capital embodied in labour (i.e. human capital, H). Thus, let the composite index be CN(L, H), where C is a scale factor and N is an increasing function of L and H. Then, in place of equation (1), we would have

$$Y = AF(K, CN(L, H)), \quad \text{where } A, C > 0. \tag{5}$$

This formulation has different implications from the previous one, but similar to the our first, which saw social capital as being embodied in total factor productivity, A. Consider once again two autarkic communities, 1 and 2. Suppose C is constant in both places and $C_1 > C_2$. Then it must be that $H_1 > H_2$, since, by definition, a worker's human capital includes the social networks to which he belongs. If L and K were the same in the two communities in some base year, Y_1 would have exceeded Y_2 in that year. If L were to remain constant in both places and the savings rates in the two were the same, accumulation of physical capital would be greater in community 1, which in turn means that the standard of living would be higher. All this, even although time series would show that the "residual" (be it dA_t/dt or dC_t/dt) in both communities was zero. In contrast to the previous model, though, in the base year the marginal product of physical capital in community 1 would have been <u>higher</u> than in community 2, which means that, ideally, physical capital ought to have moved from 2 to 1, and it would have moved had there been perfect capital markets. I conclude that embodying social capital in total factor productivity and in the scale factor C in equation (5) have similar implications, and that they both differ from the implications of embodying it in the scale factor, B, in equation (4).

Putnam (1993: 174) observes a critical difference between horizontal and vertical networks:

"A vertical network, no matter how dense and no matter how important to its participants, cannot sustain social trust and cooperation. Vertical flows of information are often less reliable than horizontal flows, in part because the subordinate husbands information as a hedge against exploitation. More important, sanctions that support norms of reciprocity against the threat of opportunism are less likely to be imposed upwards and less likely to be acceded to, if imposed. Only a bold or foolhardy subordinate lacking ties of solidarity with peers, would seek to punish a superior."

There is a third reason:

Imagine a network of people engaged in long-term economic relationships, where relationships are maintained by the practice of social norms (e.g. norms of reciprocity). Suppose new economic opportunities arise outside the enclave, say, because markets have developed. Horizontal networks are more likely to consist of members who are similarly placed. If one of the parties discovers better economic opportunities outside the enclave, it is likley that others too will discover better economic opportunities there. Both parties would then wish to re-negotiate their relationship.

Vertical (or hierarchical) networks are different. Even if the subordinate (e.g. the landless labourer) finds a better economic opportunity in the emerging markets, it is possible that the superior (i.e. the landlord-creditor) does not; in which case the former would wish to re-negotiate, but the latter

would not. It is no doubt tempting to invoke the Coase-argument (Coase, 1960), that the subordinate would be able to compensate the superior and thus break the traditional arrangement. But this would require the subordinate to be able to capitalise his future earnings, something typically not possible for such people as those who are subordinates in rural economies in poor countries. Nor is a promise to pay by instalments an appealing avenue open to a subordinate. He would have to provide a collateral. As this could mean his family left behind, the worker could understandably find it too costly to move.

The distinction between horizontal and vertical networks, and between benign and malign networks, and an absence of prices which would reflect the worth of networks makes estimation of social capital especially hard. Putnam (1993, 1995) circumvented the problems in an ingenious manner, counting membership sizes of groups in civil society, such as sports-clubs, bowling leagues, choral societies, parent-teacher associations, literary societies, and political clubs. But he didn't try to aggregate them into a single measure. In his empirical work he regressed each against other indices, such as government accountability and economic growth. Narayan and Pritchett (1997) and Fukuyama (1997) have both enlarged the domain of networks for consideration and have sought to aggregate them. They have suggested measuring a community's social capital as the weighted sum of the sizes of its various social networks. Fukuyama (1997) takes a network's weight to be an aggregate of its various characteristics, for example, the network's internal cohesion and the way it relates to outsiders. A network can therefore have a negative weight (e.g. for street gangs), in which case it would contribute negatively to a community's stock of social capital. All this has heuristic value. But there are problems.

When economic statisticians aggregate various kinds of capital equipment in a market economy into a measure of physical capital, they have prices to use as weights. To be sure, markets are most frequently imperfect and are often missing. Nevertheless, market prices offer a benchmark for estimating ideal prices (they are called "shadow", or "accounting" prices). A not-dissimilar route can be followed for estimating the value of human capital (e.g. Jorgenson and Fraumeni, 1989) and for certain types of environmental capital, such as soil, forests, and fisheries (e.g. Repetto et al., 1989).

Social capital is in a different category from these because it has its greatest impact on the economy precisely in those areas of transaction where markets are missing. The examples we have studied in this article were in part designed to bring this out. The examples have also shown why estimating the accounting prices which would go into any aggregate measure of social capital could pose insurmountable difficulties. These difficulties are a deep fact, not an incidental one, and are a reason why it is premature to regard social capital in the same way as we do physical capital and the measurable forms of environmental capital.

This isn't a pessimistic conclusion. Before we try to measure anything, we ought to ask why we wish to measure it. I don't believe we lose anything of significance in not being able to arrive at an estimate of social capital in a country, a region, a city, or wherever. The concept of social capital is useful insofar as it draws our attention to those particular institutions serving economic life which might

otherwise go unnoted. Once attention is drawn to them, we need to try to understand them and find ways of improving them or building around them. But this is the very stuff of economics. Not having an estimate of social capital is not an impediment to such exercizes.