Village versus Market Social Capital: An Approach to Development

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This paper presents a model of an economy in which traders use social capital to reduce transaction costs. A key assumption is that there are two types of social capital: “village” capital relies on personal networks and repeat play to guarantee contracts; “market” capital relies on third parties such as auditors and courts. Village capital is efficient for localized economies; market capital allows trade between strangers and greater specialization. The model shows how social capital externalities can prevent a village economy from transitioning to a market economy (industrializing) when market exchange becomes more efficient. The model helps understand the rise of West since 1600 A.D., resistance to modernization in underdeveloped countries, and market inefficiencies during transitions.

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I. Introduction

It is increasingly clear that differences across countries in economic performance and development cannot be explained entirely by differences in capital and labor inputs, factor endowments, and technology. Recent evidence suggests that “social capital” is an important missing ingredient. Yet social capital remains an elusive concept, serving as an umbrella term for a variety of empirical variables, such as trust in others, density of social networks, and honesty. The process by which it is accumulated and put to work remains something of a mystery.1

The mystery deepens when viewed at the micro level. Social capital is generally assumed to reduce the cost of transacting or cooperating. The theory of repeated games suggests that cooperation is easiest to achieve in contexts where the parties are engaged in repeated interaction and are well informed about each other (Kandori, 1992; Moore, 1995). From this perspective, many developing nations seem like ideal environments for contracting, with their localized economies based on kinship and patron-client relations, repeated play, and transacting parties who know each other well. And indeed, there are many studies showing how parties in developing or transition economies are able to maintain an impressive amount of cooperation using sophisticated informal contracts supported by repeated play and personal networks.2 Why are economies that seem to meet the conditions for efficient contracting so often poorer than other economies where transacting parties are strangers and do not transact repeatedly?

The idea we propose is that less developed economies may be well endowed with social capital, but it is the wrong kind of social capital. We distinguish two types of social capital. “Village” capital takes the form of social networks, kinship, patron-client relations, and in-depth knowledge about trading partners, and is effective in supporting

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1 For evidence that the “standard” factors cannot explain income differences, see Engerman and Sokoloff (1997), Prescott (1998), and Hall and Jones (1999). On the ability of “social capital” (or “social infrastructure”) to account for some of the otherwise unexplained variation see La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997), Knack and Keefer (1997), and Hall and Jones (1999). For a survey of the social capital literature, see Durlauf and Fafchamps (forthcoming).

2 See Bates (1990), Fafchamps and Minton (1999), Ostrom (1990), and Wade (1988) to list a few examples.
transactions based on repeated play and full information about transacting parties. “Market” capital takes the form of knowledge about how to use third party enforcement institutions such as courts, auditors, standardized accounting procedures, credit ratings, and commercial law; it is effective in supporting transactions between strangers who may not trade again in the future. In our view, either type of capital can be optimal in the right environment. Village capital works best when economic activity is primarily local, what we call a “village economy”; market capital is essential for transactions between strangers. However, only market capital can support the extensive markets, specialization, and division of labor that are prerequisites for industrialization.3

This paper develops a theory of economic exchange based on the idea that two types of social capital are available to reduce the cost of transacting. In our model, individuals choose where to trade—in the village with a known person or in the market with a stranger—as well as what type of social capital to accumulate. We consider social capital a form of human capital that is distinct from conventional human capital because its value depends on the surrounding institutions and it has external effects on other people in the economy. Trades involving people who have the appropriate type of social capital for the trading environment deliver higher payoffs for both people, and the aggregate level of social capital influences the type of social capital developed by the next generation. Because of externalities, a society can end up investing in the wrong type of social capital or, to take the case we are particularly interested in, an economy based on village capital may fail to adopt market capital even when it would be more productive to have an economy based on transactions between strangers.4

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3 Here and throughout we use “village” as a shorthand for local trades and “market” for trades between strangers, although there is not a clear dividing line in practice: there may be markets within villages, and some trades in villages may involve strangers.
4 Kranton (1996) and Dixit (2003) develop closely related models in which trade can be supported by reciprocity or by third parties. They find that traders using one type of enforcement mechanism impose costs on traders using the other mechanism, a property that emerges in our model as well, although from quite different microfoundations. An important difference in our approach is that we assume contract enforcement requires social (human) capital, and focus on the accumulation of that human capital over time which we see as central to understanding economic development.
The model helps understand why countries that were prosperous in the pre-industrial age have found it difficult to develop modern industrial economies. In preindustrial times, transportation and communication costs were high, most economic activity was local, and societies that were able to accumulate significant amounts of village capital prospered. When technology improved making it possible to trade with strangers, it became optimal to develop market capital in order to take advantage of extensive markets and division of labor. However, externalities associated with social capital made it difficult for societies heavily invested in one type of social capital to change to the other. Societies poorly endowed with village capital were in the best position to adopt the market capital necessary to support market institutions and industrialize.

In this way our model sheds light on one of the biggest mysteries in economic development: why industrialization emerged in the West instead of China, India, or the Islamic Middle East. Europe lagged the other three great civilizations in technology, science, culture, and economic performance at the end of the Middle Ages, and on the face of it seemed the least likely to modernize. In our view, it was the very success of the other regions that made it difficult for them to modernize: since trading was overwhelmingly local in preindustrial times, economic success required significant investments in village capital to support transactions, but that stock of village capital impeded conversion to market capital when technological innovations made impersonal trading feasible. Thus, our model offers a resolution to a “paradox” noted by a leading historian of medieval Islam (Udovitch, 1979, p. 273):

“The very factors—status and personal-social relations—which assured the smooth and successful functioning of credit and merchant banking activities in the Islamic Mediterranean world during most of the medieval period, effectively prevented their growth, elaboration, and development into independent, stable organizational forms. Given the slowness and unpredictability of communications between geographically distant locations, and given the sheer physical and psychological limitations on individual social intercourse, the scale of economic activities was
necessarily restricted to numerous small, even intimate, circles. The possibility of expansion into a larger, more cohesive structure was precluded by the comparatively narrow social basis on which economic life was conducted.”

By the same logic, our model helps understand why European colonies in poor, sparsely populated areas (North America, Australia, Singapore) have been leaders in the development of market institutions while colonies in wealthy, densely populated areas (Mexico, Peru) have done poorly, and struggled to move beyond local economies.

Modernization in our view is inextricably linked to a shift from village to market social capital. Development requires unwinding the web of family and kin obligations that govern life in a traditional economy and replacing it with a social structure in which individuals have more autonomy. This creates another obstacle to development in societies with large stocks of village capital: individuals may actively resist modernization order to preserve their “way of life” – consumption benefits they receive from the existing structure of social relations, such as filial piety and extended families.

Our approach to development is driven by two key ideas. The first is that institutions are not self-executing—individuals must learn how to use them. It has long been recognized that economic development depends on the creation of institutions to support market transactions (North, 1990), and institutions play a central role in our analysis. However, in our view, pro-growth institutions cannot be established simply by adopting the right written documents or appointing honest judges and regulatory officials; market institutions become effective only when the population at large accumulates the human capital necessary to use the institutions. In this respect, we follow Weingast (1997), who argues that the rule of law is not self-executing, but requires complementary attitudes and actions of citizens. Institutions matter in our framework, but are themselves reliant on a society’s social capital.5

5 The idea that institutions are partially embodied in human capital finds some support in Osili and Paulson (2003) which shows that the willingness of immigrants to participate in American financial markets depends on the type of institutions they were exposed to as children in their home countries.
The other critical idea in our analysis is that there are two kinds of social capital. The idea of different types of social capital has not been explored in the literature to date, although Krueger and Kumar (2004a, 2004b) use the idea of different types of (regular) human capital to explain growth differences between the United States and Europe. We came to this idea after puzzling for some time why people in developing countries did not have more of the social capital that the empirical literature suggested was so important for prosperity. Casual observation suggested that parents in poor countries spent at least as much time socializing their children and integrating them into family and community social networks – which should build social capital – as parents in wealthy economies. It occurred to us that although children do develop social capital in developing countries, it may be the wrong kind of social capital for market transactions. It is the assumption of two types of social capital that allows us to explain why some countries seem to have too little social capital without having to maintain that they are incapable of investing in it, lack the appropriate personal traits, or simply had the misfortune to be born into a dysfunctional culture.

The paper proceeds as follows. Section II analyzes a one-period model that shows how the distribution of social capital affects production. Section IV adds transmission of social capital to the model, and studies the dynamic behavior of social capital. Section V discusses how the model can explain some important historical patterns. Section VI concludes.

II. The One-Period Model

The economy continues for an infinite number of periods, but we begin by characterizing behavior within a single period. At each point of time, there is a measure one of agents who are identical in all respects except for the type of social capital they have. There are two types of social capital: V-capital (“village capital”) that is useful for enforcing contracts between kin and other people who are known and will be encountered again, and M-capital (“market capital”) that is useful for enforcing contracts with strangers who
are unlikely to be encountered again. Social capital does not have a direct effect on production, and each individual has only one type of social capital.

At the start of each period, a measure $m$ of the population has M-capital. The distribution of social capital can change over time but is fixed within a period. We have in mind that a period represents a generation and social capital can only change across generations. As will be seen in Section III, $m$ is the state variable in this economy. Here we take $m$ as given and analyze equilibrium within a period.

A. Model Assumptions

1. Trading Locations

Agents independently choose between two trading locations that differ in the institutions they offer for contract enforcement. Trades in the “village” are enforced using institutions that are accessed with V-capital. Trades in the “market,” which might be thought of as a distant city, are enforced with institutions that are accessed with M-capital. A person with V-capital can choose to trade in the market and vice versa.

2. Production

Once agents have decided where to trade, each is randomly matched with another and the two have the opportunity to “go into business” together. One person in each pair, chosen at random with equal probability, becomes the “seller” and the other becomes the “buyer.” The seller can provide one unit of an intermediate good to the buyer, who then combines it with other resources to produce a final good. The final good produced in the market sells for $\theta$ and the final good produced in the village sells for 1.

A critical distinction between village and market capital in our analysis is that village capital can only support local transactions while market capital can support trades between strangers. Because personal networks are inherently limited in scope, village capital is unable to support a broad market with extensive division of labor. As Ben-Porath (1980, p. 14) put it in a well known article, “The transactional advantages of the

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6 Our names for the two trading locations should be understood as heuristics for the underlying enforcement institutions and not taken too literally. For example, people in a village could sign a formal contract and seek to have it upheld by a court rather than a village elder.
family cannot compensate for the fact that within its confines the returns from impersonal specialization and division of labor are not fully realizable.” We incorporate this into the model by assuming that \( \theta \geq 1 \). Such a relation would emerge from more fundamental assumptions, such as Dixit-Stiglitz preferences for diversity a la Romer (1990).\(^7\) We keep the production side of the model simple and begin with a reduced form in order to focus on the role of transactions.

The seller can produce the intermediate good at a cost of \( c < 1 \). Alternatively, he can acquire capital (build a factory, train to develop his human capital, etc.) that allows production at a cost of 0. To acquire the capital requires an investment of \( k \). We assume that \( k < c \) so it is efficient to make the investment. The capital is relationship-specific and has no value outside the particular business relationship for which it is constructed. The buyer can observe if the investment was made, but outsiders are unable to verify it so contracts cannot be contingent on making the investment. The holdup problem this creates is well known from the theory of the firm and financial contracting literature (Grossman and Hart, 1986; Hart, 1995). As discussed below, we will be assuming \( k > .5c \), which makes an inefficient outcome possible.

3. Contracts and Social Capital

Each period is divided into two subperiods. In the first subperiod, the parties agree on a contract that divides the revenue from sale of the final good. The contract assigns an amount \( p \) to the seller, leaving the buyer with \( \theta - p \) in the market or \( 1 - p \) in the village. The buyer has no initial wealth, so he cannot purchase the input outright.\(^8\) After the initial contract is signed, the seller has the option to make the investment \( k \).

In the second subperiod, the parties meet again and either may try to renegotiate the initial contract. As will become clear, the seller never wants to renegotiate, but the buyer might hold up the seller and ask for a reduction in \( p \) if the seller has sunk the cost

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\(^7\) See also Dixit (2003), which develops a model of the limits of self-enforcing contracts when external enforcement is an available alternative.

\(^8\) If the buyer could pay the seller up front, then hold up would not be a problem given the one-sided nature of our formulation. Money would act as a costless enforcement mechanism. On the other hand, this would create a different problem because the seller could take the cash and fail to deliver the intermediate good.
of the investment. With the appropriate social capital, the seller can call on outside institutions to uphold the initial contract. Specifically, a seller with V-capital in a village can call on family connections, social pressure, patron-client relations, and so, to require the buyer to abide by the initial contract. A seller with M-capital in the market can turn to courts, regulators, and other impartial enforcers. However, a V-person trading in a market lacks the knowledge to call upon the enforcement mechanisms in the market, and an M-person trading in a village is unable to use social networks to defend the contract.\footnote{We are assuming that market institutions cannot be used in the village. That is, people who trade in the village do not write notarized contracts using language that would enforceable in a court, but rather follow practices and customs (the proverbial “sealed with a handshake”) that allow interpersonal institutions to be called on. Here again, “village” and “market” transactions should be understand as referring to the underlying enforcement institutions more than the physical location of the meeting.} After the final contract is settled (either by appeal to an authority or renegotiation), the seller produces the intermediate good at cost of 0 or \( c \), as the case may be, the good is sold, and the revenue is divided.

All surpluses are divided equally yielding the Nash bargaining outcome. Bargaining occurs in the first subperiod to set the initial contract \( p \), and in the second subperiod if the buyer tries to renegotiate. Each party’s reservation value is 0 if no agreement is reached.

\section*{B. Equilibrium Contracts and Production}

The production arrangement for any pair of people depends on their social capital and where they trade. As a benchmark, observe that the first-best outcome is for the seller to make the capital investment because \( k < c \).

\textbf{Case 1. M-person meets M-person in the market}

In this case, the initial contract \( p \) will be enforced and the first-best achieved. If the seller makes the investment \( k \), then the surplus is \( \theta - k \) and the price is set to divide the surplus equally: \( p = k + .5(\theta - k) \). Given \( p \), the seller’s payoff from making the investment is \( p - k \), which exceeds his payoff from not making the investment, \( p - c \), so he will make the investment. Each person’s return is \( r_{MM} = .5(\theta - k) \).
Case 2. V-person meets V-person in the market

Because neither person has the appropriate social capital, the initial contract cannot be enforced and the final price is always set by renegotiation. If the seller has not made the investment, then the final price is \( p = .5(\theta - c) + c \). If the seller has made the investment, then the final price is \( p = .5\theta \) because the cost \( k \) is sunk and the surplus is \( \theta \). The seller is in a weaker bargaining position after he makes the investment.

Now consider the seller’s decision whether or not to invest. If he does not invest, his return is \( p - c = .5(\theta - c) \). If he does invest, then his return is \( p - k = .5\theta - k \). Thus, he will not invest if \( .5\theta - k < .5(\theta - c) \), which reduces to \( k > .5c \). To allow for the possibility of inefficient outcomes, we assume this condition holds throughout the paper so our cost assumptions together are \( .5c < k < c \). Intuitively, because the investment \( k \) is sunk, it plays no role in the final bargaining and the seller must pay all of it himself. The cost \( c \), on the other hand, does matter for bargaining since it is not sunk, and the seller ends up absorbing only half of it.

The upshot of all of this is that the seller does not make the investment when he cannot enforce the initial contract. Each person’s return is then \( r_{VV} = .5(\theta - c) \).

Case 3. M-person meets V-person in the market

The outcome in this case depends on who is the buyer and who is the seller. If the M-person is the seller, the contract is enforceable and the seller not at risk of being held up by the buyer. The parties then agree to the first-best contract as in Case 1, with \( p = .5(\theta - k) \), and each person earns a return of \( .5(\theta - k) \). If the V-person is the seller, he cannot resist the buyer’s demand to renegotiate the initial contract, and therefore will not make the investment, as in Case 2. Each person then earns a return of \( .5(\theta - c) \). Since there is an equal chance that each person is the seller, the expected return from this pairing for either person is \( r_{MV} = .5r_{MM} + .5r_{VV} = .5(\theta - .5(k + c)) \).

The return from trading in the village is determined analogously. The differences are first, that V-capital and not M-capital can be used to enforce the initial contract, and
second, that the value of the final good is 1 instead of $\theta$. So, for example, when a V-person meets another V-person in the village, the return for each is $0.5(1 - k)$.

Note that all agents prefer to trade with agents who have social capital that can tap the enforcement institutions available at the trading location. Thus, there is an externality associated with social capital: it affects the individual’s return but also the return of individual’s trading partner: $r_{VV} < r_{MV} < r_{MM}$. Also, the value of social capital depends on the trading location not the trading partner. This idea that social capital is institution-specific distinguishes our approach from pure coordination models, like the culture model of Lazear (1995, 1999).

C. Equilibrium Trading Locations and Income

We can now characterize equilibrium trading locations and income for a given $m$. Let $\pi_x(L)$ denote the expected payoff for a person with I-capital who trades in location $L \in \{M, V\}$ and let $x$ be the fraction of people in the market with M-capital. The payoff for an M-person trading in the market is then $\pi_M(M) = xr_{MM} + (1 - x)r_{MV}$.

We first show that an M-person always trades in the market. Suppose to the contrary that some M-people traded in the village. Then $\pi_M(M) \leq \pi_M(V)$. Now because M-capital is better than V-capital for market trades, $\pi_M(M) < \pi_M(V)$, and because V-capital is better than M-capital for village trades $\pi_M(V) < \pi_V(V)$. The three inequalities together give $\pi_M(M) < \pi_V(V)$, implying that no person with V-capital would trade in the market: $x = 1$. However, if $x = 1$, then all market trades are efficient and $\pi_M(M) = r_{MM} > r_{MV}$, a contradiction. Intuitively, if it paid for any M-people to trade in the village, then it would pay for all V-people to trade in the village; but this would mean that only M-people traded in the market, they could achieve first-best there, and so would not want to trade in the village.

Now consider the trading decision of a person with V-capital. Since all M-people trade in the market, only V-people trade in the village. As result, all pairings in the village are between V-people and production arrangements are efficient:
\[ \pi_v(V) = .5(1 - k). \] The payoff in the market for a person with V-capital is \[ \pi_v(M) = xr_{Mv} + (1 - x)r_{Vv}. \]

A person with V-capital chooses a trading location by comparing \( \pi_v(V) \) and \( \pi_v(M) \). If \( \theta \) is small enough, all V-people will trade in the village since the market’s productivity advantage over the village, \( \theta - 1 \), does not offset the expected cost of inefficient investment due to lack of M-capital, \( .5(c - k) \). When \( \theta \) is sufficiently large, some V-people will be attracted to the market. Since \( \pi_v(V) \) is increasing in \( x \), V-people will enter the market and drive down \( x \) until their payoff is equal in the village and the market. Let \( x_0 = 2 - 2(\theta - 1)/(c - k) \) denote the fraction of M-people in the market that solves \( \pi_v(M) = \pi_v(V) \). If there not enough V-people in the economy to equalize the payoff to V-people in the village and market (that is, if \( m > x_0 \)) then all V-people will trade in the market. The relation between \( m, x_0 \), and equilibrium trading locations \( x^* \) can be summarized as follows.

**Proposition 1 (Trading Locations).** If \( 1 \leq x_0 \) then \( x^* = 0 \), all M-agents trade in the market, and all V-agents trade in the village. If \( m \leq x_0 < 1 \) then \( x^* = x_0 \), all M-agents trade in the market, and V-agents trade in the market and village. If \( x_0 < m \) then \( x^* = m \) and all agents trade in the market.

Proposition 1 links trading behavior to the stock of social capital and the productivity of the market relative to the village. Given that \( x_0 \) is a simple function of the market productivity parameter \( \theta \), we can restate the trading conditions in Proposition 1 somewhat more transparently in terms of the relative productivity of the market, \( \theta - 1 \), and the stock of social capital, \( m \) (Figure 1).

The economy’s response to an increase in market productivity is found by a vertical movement in Figure 1. For sufficiently low \( \theta - 1 \), all V-people trade in the village. As \( \theta - 1 \) rises, V-people are divided between the market and village, until for a sufficiently high \( \theta - 1 \), all V-people are in the market.
The effect of the distribution of the social capital stock is seen by moving horizontally in the figure. When $\theta - 1$ is small, the distribution of the social capital stock does not affect trading locations since all V-people trade in the village and all M-people trade in the market. When $\theta - 1$ is large enough, V-people are attracted to the market until the return in the market is driven down to the return in the village. For small $m$, some V-people are left in the village, while for large $m$, all V-people end up in the market.

Proposition 1 leads to a characterization of aggregate income in the economy, defined as

$$
\Pi(m) = m \pi_M(M) + (1-m) \max \{ \pi_V(V), \pi_M(M) \}.
$$

Given that we normalized the population size to 1, $\Pi$ can also be interpreted as income per capita. The next proposition relates aggregate income to $m$ and $x_0$ by substituting the appropriate values for $\pi$ and rearranging.

**PROPOSITION 2 (AGGREGATE INCOME).** If $1 \leq x_0$ then $\Pi = .5(1 - k + m(\theta - 1))$. If $m \leq x_0 < 1$ then $\Pi = .5(1 - k + .5m(c - k))$. If $x_0 < m$ then $\Pi = .5(\theta - c + m(c - k))$.

Proposition 2 leads to two comparative static observations that are important in our analysis of long run development. The first observation is that $\Pi$ is monotonically increasing in $m$: an economy always performs better if the amount of M-capital increases (leaving aside for now the costs of acquiring capital). Somewhat counterintuitively, it is not better to have more V-capital even when most trading takes place in the village. The reason is that market transactions yield a higher final sale price ($\theta > 1$), and when V-people trade in the market, some market transactions are inefficient; reducing the number of people with V-capital in the market creates a wealth gain by reducing the production cost.

A second important observation concerns the connection between $\Pi$ and the market productivity parameter $\theta$. The parameter can increase due to a direct improvement in market production technology; an increase can also represent a reduction
in transportation and communication costs associated with market exchange.\textsuperscript{10} The relation between $\Pi$ and $\theta$, holding constant $m$, is depicted in Figure 2. With a low value of $\theta$, no V-people trade in the market ($x = 1$). Because market productivity affects only the $m$ people in the market, an increase in $\theta$ increases aggregate income by only $.5m$ at the margin. Improvements in market technology matter here, but the effect is modest in an economy primarily based on V-capital.

When market productivity rises so that $\theta > 1 + .5(c - k)$, V-people are attracted to the market. They enter until the expected payoff for V-people is the same in the market and village ($x = x_0$). Because of the presence of V-people in the market ($x < 1$), the average market transaction will be less efficient than before the market technology improved. Symptoms would include fewer long term contracts and less fixed investment. In this range, a marginal increase in $\theta$ has no effect on aggregate income because the improvement in productivity is entirely dissipated by V-people entering and disrupting the market. Somewhat surprisingly, technology improvements in this range do not increase income and will even make the market function less efficiently on average. This case suggests that investment designed to facilitate market exchange (better roads, communications) can be ineffective and even spoil the market if too few people are equipped with the social capital that allows them to trade efficiently in the market.

When market productivity enters the highest region, $\theta > 1 + (1 - .5m)(c - k)$, all V-people participate in the market. In this region, market productivity has the largest impact on aggregate income. An increase in $\theta$ has a marginal effect of $.5$ on income because it increases the return in every transaction.

\textbf{D. Inefficiency 1: Too Many V-People in the Market}

Trading decisions in the one-period model are typically inefficient. Here we highlight the nature of the inefficiency and its cause. Consider a planner who chooses

\textsuperscript{10} For example, suppose market transactions involve a transportation cost that is not involved in village transactions. That is, in order to trade with a stranger, a person must travel to a distant city. Then we can write $\theta = \overline{\theta} - (\text{transportation costs})$. As the cost of traveling to the market falls, the relative productivity of a market transaction ($\theta - 1$) rises.
what fraction of each type of person trades in the market and what fraction trades in the village in order to maximize $\Pi$. Contracting and investment decisions remain the province of the individual agents.

First, note that the planner will send all of the M-people to trade in the market. To understand why, consider a transfer of one M-person from the village to the market. Such a transfer increases $\Pi$ because market trades are more productive, and the M-agent is more efficient in the market.

Since the planner assigns all M-people to the market, only V-people trade in the village, and village transactions are efficient. The planner’s problem is then to choose the measure of V-people trading in the market, call it $q$, to solve

$$\max_q \{ m\pi_M(M) + q\pi_V(M) + (1 - m - q)\pi_V(V) \},$$

where $\pi_M(M)$ and $\pi_V(M)$ depend on $q$. Assuming an interior solution, the first order condition is

$$\pi_V(M) - \pi_V(V) + \left( m \frac{d\pi_M(M)}{dq} + q \frac{d\pi_V(M)}{dq} \right) = 0.$$

The first two terms are the payoff for a V-person from trading in the market compared to trading in the village. This is the only information used by decentralized agents when they make their trading decisions. The planner’s choice is different because it also involves the last term, which captures how additional V-people in the market affect the payoffs of other agents through a change in $q$. The term is negative: additional V-people in the market reduce $q$ and therefore reduce the payoffs of other M-people and V-people trading in the market. Thus, the planning problem assigns fewer V-people to the market, or put differently, in a decentralized equilibrium the number of V-people trading in the market is inefficiently high.
III. The Dynamic Model

The previous section explored the trading decision of agents given the stock of social capital $m$. In this section, we turn to the evolution of social capital over time. Following Glaeser, Laibson, and Sacerdote (2002), we treat social capital as a form of human capital that can be accumulated at a cost, rather than as a personality trait like honesty. Village capital is created by developing personal relations with kin and other people in the community. Such capital accumulates passively in the process of socializing and can be created deliberately, for example, by forming marriage alliances (for example, in parts of rural India it was long the custom for a man to marry his niece) and giving gifts (which anthropological studies indicate is an important expenditure in my local economies (Bates, 1990)). Market capital is typically acquired more formally than village capital, and is more costly, such as when students study accounting and law. Formal education in many countries also imparts a general familiarity with market institutions that creates trust in their effectiveness (Knack and Keefer, 1997).11

A. The Social Capital Accumulation Process

We assume that each agent is an adult for one period, during which he trades and also guides the social capital accumulation of his single child. Social capital is accumulated by a child partly as a result of purposeful decisions of the parent, and partly as a result of prevailing social conditions. For example, parents can choose to send children to school, tutors, and other activities that might build M-capital, or keep them at home working, interacting with relatives, and engaged in community activities that build V-capital. Yet parents can only influence the outcome: despite the efforts of parents, children may learn by observing others (Bisin and Topa (2003)). All else equal, a child is more likely to accumulate village capital if he or she grows up in a community with dense personal networks than in a house on a desolate prairie.

11 In our model, the amount of “trust” is captured by $x$, the probability that a contract will be honored in the market. Trust in our model thus is not a trait, but an equilibrium value that represents the effectiveness of social capital in enforcing contracts. For a dynamic model that treats “trustworthiness” as a personal trait, see Francois and Zabojnik (forthcoming).
Our social capital accumulation process is an adaptation of the cultural transmission model developed in a series of papers by Bisin, Topa, and Verdier (BTV).\textsuperscript{12} The probability a child acquires I-capital is $\phi_{I}$ is assumed to follow

\begin{align*}
\phi_{M} &= hf(m); \\
\phi_{V} &= 1 - hf(m);
\end{align*}

where $h \in [h, \bar{h}]$ is the amount of “time” spent learning M-capital (formal schooling), chosen by the parent, and $f$ is an increasing, weakly concave function. The term $f(m)$ captures the effect of the population at large on the accumulation process and plays a critical role in our analysis. The child is more likely to acquire M-capital when $m$ is large than when $m$ is small, holding constant time spent learning M-capital. We assume that $0 < h < \bar{h} < 1$ and $0 < f(0) < f(1) < 1$ so that both outcomes are possible; there is always some chance a child will acquire social capital that does not reflect the parent’s preference or the social norm.\textsuperscript{13}

Finally, we assume that M-capital is more expensive to acquire than V-capital. The per unit cost of $h$ is $w > 0$, and the cost of V-capital is normalized to zero. While $w$ can be viewed as a direct resource cost, it also includes the opportunity cost of attending school instead of engaging in household production. When there are many employment

\textsuperscript{12} See Bisin and Verdier (2001), Bisin and Topa (2003), Bisin, Topa, and Verdier (2004), and the references therein.

\textsuperscript{13} In the BTV approach, a child is matched to a role model/teacher chosen by parents with some probability, and otherwise is matched to a random adult in the population. Our process can be expressed in BTV terms by letting $d$ be the probability (selected by the parent) that a child is matched to a V-capital role model and accumulates V-capital. With probability $1 - d$, the child is matched to random adult who imparts M-capital with probability $f(m)$ and V-capital with probability $1 - f(m)$ Then the child learns V-capital with probability $\phi_{V} = d + (1 - d)(1 - f(m))$, which boils down to our formulation when $h = 1 - d$. Unlike a standard BTV model, we have damped the social effect with the concave function $f$.,
opportunities for children or a scarcity of schools (as in many less developed economies), the value of \( w \) is high.\(^{14}\)

**B. Steady States**

Let \( \pi_t(m) \) denote the one-period payoff of a parent with I-capital who optimally chooses a trading location as in Section II, and let \( \beta \) be the intergenerational discount rate. The Bellman equation of a person with I-capital is:

\[
(2) \quad u_t(m) = \max_h \{ \pi_t(m) - hw + \beta \phi_s u_{m'}(m') + \beta \phi_v u_r(m') \},
\]

where \( m' \) is the posited value of \( m \) in the next period. The equilibrium law of motion for \( m \) consistent with the behavior implied by the Bellman equation is denoted \( \Phi \), so \( m' = \Phi(m) \).

The first order condition for \( h \) in (2) is

\[
(3) \quad \beta f(m) u_{m'}(m') - u_r(m') \begin{cases} 
> & \text{when the inequality is } > \, \text{when the inequality is } > . \\
< & \text{when the inequality is } < , \text{ and } h = h & \text{when the inequality is } > .
\end{cases}
\]

The left hand side is the marginal benefit of schooling. It depends on the difference between the utility of having M-capital and V-capital in the next period, discounted by the intergenerational discount rate and the probability that social effects will reinforce the effect of schooling in forming M-capital. The right hand side is the marginal cost of schooling. The problem is linear in \( h \) so the solution is either \( h = h \), when the inequality is <, and \( h = h \), when the inequality is >.

Because the social capital accumulation process does not depend on the parent’s type (except through social pressure in the aggregate), both types of parents choose the

\(^{14}\) Note that while our agents influence what type of human capital their children have, the quantity is fixed and identical for all agents. If people were allowed to have no social capital or a variable quantity, then there would be two state variables and there would not be a simple characterization of the equilibrium.
same \( h \) for their children.\(^{15} \) Therefore, the law of motion is simply \( \Phi = hf(m) \). From (2), \( u_m - u_v = \pi_m(m) - \pi_v(m) \equiv \Delta \). When \( \theta - 1 \leq .5(c-k) \), that is, when market productivity is low enough that all people with V-capital trade in the village, \( \Delta = .5(\theta-1) \). When \( \theta - 1 > .5(c-k) \), at least some V-people trade in the market, and \( \Delta = .5(c-k) \). Therefore, \( \Delta \) is continuous and nondecreasing in \( \theta \) and independent of \( m \). The first order condition (3) can be rewritten in the convenient form

\[
(3') \quad \beta f(m) \Delta(\theta) = w. 
\]

Since \( f \) is increasing in \( m \), there is at most one value of \( m \) that solves \( \beta f(m) \Delta(\theta) = w \). Define the critical value \( \mu \) as:

\[
\mu = \begin{cases} 
0 & \text{if } \beta f(0) \Delta(\theta) > w; \\
1 & \text{if } \beta f(1) \Delta(\theta) < w; \\
z & \text{otherwise where } \beta f(z) \Delta(\theta) = w.
\end{cases}
\]

Observe that \( h = \underline{h} \) if \( m < \mu \), and \( h = \overline{h} \) if \( m > \mu \). Therefore, the equilibrium transition function is

\[
\Phi = \begin{cases} 
hf(m) & \text{if } m < \mu; \\
\overline{hf}(m) & \text{if } m > \mu.
\end{cases}
\]

Figure 3 illustrates one possibility. The light curves represent \( hf \) and \( \overline{hf} \), while the dark curves represent the equilibrium \( \Phi \). It is clear that there can be one or two steady states, depending on the location of \( \mu \). The next proposition characterizes the steady states.

\(^{15}\) Our formulation also implies that the parent’s type does not directly influence the child’s type. One of our main results is that aggregate social capital influences accumulation and creates inertia. The effect would be amplified if parental type mattered.
Proposition 3. Define $m_0$ and $m_1$ to solve $hf(m_0) = m_0$ and $\bar{hf}(m_1) = m_1$.

- If $\mu < m_0$ then there is a unique steady state with $m = m_1$. The steady state is stable and all parents choose $h = \bar{h}$ for their children.
- If $m_0 < \mu < m_1$ then there are two steady states. Both are stable. In one steady state, $m = m_0$ and all parents choose $h = \bar{h}$. In the other steady state, $m = m_1$ and all parents choose $h = \bar{h}$. The aggregate payoff $\Pi$ is lower at $m_0$ than $m_1$.
- If $m_1 < \mu$ then there is a unique steady state with $m = m_0$. The steady state is stable and all parents choose $h = \bar{h}$ for their children.

Proposition 3 shows there are two qualitatively different steady states: $m_0$, in which no parents send their children to school, and $m_1$, in which all parents send their children to school. We call the first case a “V-capital equilibrium” and the second an “M-capital equilibrium.” Regardless of the equilibrium, there will be agents with both types of social capital because the social capital transmission process is noisy.

A critical question is what determines which equilibrium prevails. One way to answer that question is to identify parameter configurations for which only $m_0$ or only $m_1$ are feasible. From Proposition 3, we see that there is a unique V-capital equilibrium for sufficiently high $\mu$, and a unique M-capital equilibrium for sufficiently low $\mu$. The definition of $\mu$ and (3’) lead to the conclusion that an M-capital equilibrium prevails given a sufficiently large $\beta$ or a sufficiently low $w$ (and conversely for a unique V-capital equilibrium). As parents care more about their children and as the cost of schooling falls, parents are more likely to invest in M-capital. The possible equilibria are also affected by the underlying parameters of the one-period model through $\Delta$. When the market technology is poor, an increase in $\theta$ increases $\Delta$, reducing $\mu$, making the M-capital equilibrium more likely. An increase in $c-k$ also increases $\Delta$, which makes investment in M-capital more attractive.
The case of $m_0 < \mu < m_1$ is particularly interesting because then initial conditions matter. If the economy begins with $m < \mu$, it transitions to the V-capital equilibrium. If the economy begins with $m > \mu$, it transitions to the M-capital equilibrium. Thus, an economy that begins with abundant V-capital can be locked into that type of capital. The aggregate payoff is higher in the $m_1$ than the $m_0$ equilibrium, from Proposition 2. This economy has dynamic “increasing returns” that give rise to multiple steady states because the likelihood that a child becomes an M-person is increasing in the fraction of M-people in the economy due to the possibility of outside socialization.

C. Industrial Revolution and Stagnation

In this section we use the model to understand the factors that determine whether an economy industrializes or to stagnates when technology changes. We treat industrialization as the process of shifting the basis of the economy from V-capital to M-capital. The importance of market institutions such as commercial law is a longstanding theme in the development literature (North and Thomas, 1973; North, 1990). Our view is that industrialization requires both development of market institutions and accumulation of M-capital because institutions are not self-executing. Here we assume that supporting market institutions are elastically supplied if the population acquires M-capital. This abstracts away from important issues concerning adoption of institutions, but lets us focus on the underexplored development problems associated with social capital.

The preindustrial period is characterized by localized production with little scope for trade between strangers. The main cause of localized production for most of human history was high transportation and communication costs. As discussed above, high transportation and communication costs can be represented by a low value of $\theta$. We study an economy that begins with $\theta \approx 1$, and explore how the economy reacts when market productivity increases to $\theta' > 1$. If the economy transitions to market exchanges supported by M-capital we say it “industrializes” and when it remains focused on less efficient village transactions we say it “stagnates.”

To begin, observe that with $\theta \approx 1$, all V-people trade in the village, and the payoff from V-capital is approximately equal to the payoff from M-capital: $\Delta \approx 0$. Given that
M-capital is costly, parents guide their children to accumulate V-capital. The initial equilibrium is $m_0$, and $m_1 < \mu$.

Now suppose $\theta$ increases so that $\Delta > 0$. The higher productivity of market transactions increases the value of M-capital relative to V-capital, strengthening the incentive for parents to send their children to school to learn M-capital. If the increase in market productivity is large enough, some V-people will be attracted to the market, causing its performance to deteriorate. Whether the economy develops or not depends on whether parents start to send their children to school. If they do, the economy will transition monotonically to $m_1$, what we call industrialization. If parents continue to emphasize V-capital, the economy will stagnate at $m_0$. Although the model is somewhat involved, the critical condition for development is fairly simple, giving a central result:

**Proposition 4.** Suppose the economy begins at $m_0$. If the market productivity increases from $\theta \approx 1$ to $\theta' > 1$, the economy industrializes if and only if $\mu(\theta') < m_0$.

*Proof:* Observe that $\mu$ is decreasing in $\theta$ through $\Delta$. From Proposition 3, there are three cases. First, if $\mu(\theta') > m_0$, then there is a unique steady state $m_0$. Second, if $m_0 < \mu(\theta') < m_1$, then there are two steady states. However, given that the economy begins at $m_0$, it will stay there. Third, when $\mu(\theta') < m_0$, the unique steady state is $m_1$. Only in the third case will the economy transition from $m_0$ to $m_1$.

Proposition 4 leads to several interesting implications. First, whether or not an economy develops depends on initial conditions. The lower is the initial fraction of M-capital, the less likely development will be triggered by any given increase in market technology. An economy heavily invested in V-capital (low $m$) that was prosperous when trading was local will find it more difficult to industrialize than an economy with little V-capital. Why don’t parents have their children learn M-capital when market transactions become more efficient? The main reason is that they are worried that social pressure will
overwhelm their efforts and the cost of training will be wasted. Socialization effects might prevent children from learning M-capital even if they are sent to school.

Another implication is that industrialization is easier for economies with low costs of schooling, \( w \) (a low value of \( w \) reduces \( \mu \)). The cost of schooling may be high, for example, if existing production arrangements provide ample opportunities for children to work. Initial conditions may also influence development through \( w \). If, as seems plausible, \( w \) is decreasing in \( m \) (personal relations are relatively easier to build in a world with pre-existing dense social networks), high initial levels of V-capital will inhibit development by raising the relative price of M-capital.

Another interesting observation is that even a developing economy might not experience increasing income in the short run. Suppose the economy begins with an \( m_0 \) in which some V-people trade in the market and others in the village. Then a marginal increase in \( \theta \) has no effect on income (Proposition 2) – even if the economy is industrializing – because more V-people enter and disrupt the market, fully dissipating the productivity increase. Over time, as more children acquire M-capital, income begins to grow but more V-people enter the market, partially dissipating the efficiency gains. Only once a sufficiently large fraction of the population has M-capital, a point at which no V-people trade in the market, does aggregate income respond strongly to increases in \( \theta \) and \( m \). This suggests that a growing tendency of parents to have their children learn M-capital instead of V-capital may be a better indicator than rising income that an economy is on the path to development.

D. Inefficiency 2: Too Little Investment in M-Capital

In Section II, we showed that too many V-people choose to trade in the market for any given distribution of social capital. Now we consider how the accumulation of social capital compares to the optimum. Suppose the planner cannot affect the trading location or investment behavior of individuals. The planner’s Bellman equation is:

\[
W(m) = \max_h \{ m \pi_M(m) + (1 - m) \pi_V(m) - hw + \beta W(m') \}.
\]
The planner chooses the same amount of schooling for every person, and the transition function for an individual remains (1). Given the infinite number of people, the fraction of people with M-capital in the next period is a deterministic quantity \( m' = hf(m) \). Therefore, the planner can control the evolution of \( m \) through the choice of \( h \). The planner’s first order condition is

\[
(4) \quad \beta W' = w, \\
\text{when the derivative exists.} \]

Condition (4) differs from the private schooling decision \( 3' \) only in the term \( W' \), which replaces \( \Delta \). The envelope condition is

\[
W' = \Delta + m\pi'_M + (1 - m)\pi'_V + \beta hfW'(m') > \Delta. \\
\text{Thus, the planner perceives a higher} \\
\text{marginal benefit from investment in M-capital than private individuals perceive. Put} \\
\text{differently, investment in schooling is too low in the decentralized outcome.}
\]

There are two reasons why private investment in M-capital is inefficiently low. The first is that private individuals do not take into account that their M-children will provide a transaction cost saving to others. Second, they ignore the fact that accumulation of M-capital by their children will make it easier for future generations to accumulate M-capital via socialization.

One implication is that subsidies to schooling can lead to more efficient development. Similarly, this suggests a rationale for compulsory education in developing countries. However, the type of schooling matters: it has to be schooling that increases M-capital. Education that teaches how to use market institutions would help. Education in which students invest in community relations, say working on community projects, would be counterproductive if it facilitates accumulation of V-capital. A related implication is that attempts to foster development by encouraging development of V-capital (community projects, local governance and decisionmaking, etc.) may be counterproductive, particularly if they end up discouraging individuals from accumulating M-capital. Social capital based on interpersonal relations is productive, but development requires a different kind of social capital.
IV. Historical Patterns

A central message of our paper is that village social capital impedes development. According to our analysis, in preindustrial times when transportation and communication costs are high, village capital is optimal because most trading is local. When transportation and communication costs fall, countries can increase the volume of trade between strangers and the division of labor if they develop the human capital and institutions to support such transactions. Economies that begin with dense social networks and a large stock of village capital struggle to reinvest in market capital because of the external effects of social capital on production and social capital accumulation. Economies with little village capital to begin with find it easier to develop a market economy. This section provides historical evidence in support of our main implications.

A. Rise of the West

Perhaps the biggest mystery of economic development is why modern market institutions and industrialization emerged in the West, especially Western Europe, and not China, India, or the Middle East. Of these four great civilizations, Europe at first glance appears to have been the least likely to modernize. In the preindustrial 16th and 17th centuries, China, the Ottoman Empire, and (arguably) India were the wealthiest and most advanced regions of the world, and the feudal states of Europe were poor and backward by comparison. Yet it was Europe that pioneered industrialization in the 18th century, surpassing the other three regions in output.

Modernization emerged over several centuries and involved innovations in law, banking, finance, and organization. But the spark that seems to have lit the fire was innovations in transportation and communication that dramatically reduced the cost of trading with distant strangers. Advances in navigation, shipbuilding, and then the steam engine made it possible to cross oceans, sail against the wind, and travel along seas and rivers that were not previously navigable. Construction of canals and railroads reduced transportation costs inland. Communication costs plunged with cheaper transportation and then development of the telegraph. Yet technology cannot easily explain why the West industrialized while the other regions stagnated. In the Middle Ages, Europe lagged
China in technology (Needham, 1954-) and the Islamic Middle East in science and culture (Lewis, 1995). Moreover, technological innovations diffused across Eurasia (Needham, 1954-) so that even if one region was a leader in developing new technology, the others could have followed soon after. The puzzle is why the other regions did not take advantage of the new technologies that European nations exploited to create modern market based economies. Our view is that industrialization in China, India, and the Islamic Middle East was inhibited in the 18th century by the massive stocks of village social capital that ironically had been a source of prosperity over the preceding centuries.16

1. Islamic Middle East

Lewis (1995, pp. 177) notes that during the Middle Ages “the commerce of the Islamic Middle East was in every way ahead of that of Europe – richer, larger, better organized, with more commodities to sell and more money to buy, and a vastly more sophisticated network of trading relations.” At the apex of the Ottoman Empire, during the rule of Suleyman the Magnificent (1520-1566), the Ottoman army was better organized, equipped, and formidable than any in Europe, and European visitors were routinely impressed by the splendor of the sultan’s court compared to courts of their home countries.

In our view, it was the very success of the Islamic states in the Middle Ages that made it difficult for them to modernize. As Udovitch (1979) observed in the passage we cited in the introduction, the stock of village capital functioned well when trade with strangers was limited made it difficult to convert to market capital. North (1998, pp. 20-21) reached a similar conclusion: “The traders from the Islamic world developed in-group social communications networks to enforce collective action which, while effective in relatively small homogeneous ethnic groups, do not lend themselves to the impersonal exchange that arises from the growing size of markets and diverse ethnic traders.” Islam

16 The failure of China, India, and the Islamic Middle East to develop has been blamed on culture, religion, and political failures (for references, see Jones (2003)). We believe these other explanations are probably part of the story, but do not discuss them in this section in order to focus on the role of social capital, which has not received much attention to date.
had developed an extensive body of contract law to support business ventures as early as the 10th century that might have developed into a modern commercial code, and there were healthy credit markets (Udovitch, 1970; Kuran, 2003, 2004). Lending was largely relational, however, and Islamic states did not make the transition to non-relational banking until the 20th century.

2. China

China in the late Middle Ages was probably the most technologically and economically advanced region of the world. Even as late as the rein of the Qianlong Emperor (1735-1796), China was able to impress the West with its splendor and sophistication – “China is a much richer country than any part of Europe,” wrote Adam Smith (1776, Book I, Ch. XI) – and seemed to be laying the groundwork for industrialization, with growth of a merchant class, commercialization, and interregional trade. Fairbank (1992, p. 186), an eminent historian of China, wrote, “We are left with the impression that as of 1750 or so the preindustrial societies of China and Europe had much in common; indeed, they probably seemed in appearance to be more like each other than like the Western states that would emerge transformed by the Industrial Revolution.” Yet like the Middle East, China stagnated while the West developed.

A critical factor again, in our view, was the overhang from a rich endowment of village social capital. For millennia, social relations in China revolved around the family, the defining unit of economic life. Much more so than in the West, joint families were common in which several sons and their wives would live together under the same roof, kinship relations were patriarchal, marriages were strictly arranged, and children were expected to respect their elders and define their interests in terms of the family rather than individually (Whyte, 1996). The dominance of the family and personal relations spilled over into commerce (Fairbank, 1992, p. 186): “Business relations were not cold impersonal matters governed by the general principles of the law and of contract in a world apart from home and family. Business was a segment of the whole web of friendship, kinship obligations, and personal relations that supported Chinese life.” China also had an impressive legal code by 1500, but it did not penetrate down to everyday life (Fairbank, 1992, p. 185):
“Resolution of conflicts among the people was . . . achieved through various customary and nonofficial channels. Conflicts arising from business deals and contracts might be settled by craft or merchant guilds. Disputes between neighbors might be mediated by village elders, neighborhood associations, or gentry members. In particular, the heads of extended family (lineage) or clan organizations, in addition to maintaining the religious rituals of ancestor reverence, supporting schools for clan members’ children, and arranging marriages, would make every effort to keep their members out of court by assuring their tax payments and settling disputes among them.”

Village capital in the form of kinship served China well during the millennia when most economic activity was local, but became an obstacle to progress when industrialization became possible. “China has been a stronghold of the family system and has derived both strength and inertia from it,” concluded Fairbank (1992, p. 18).

3. India

India is another great civilization that seemed a reasonable candidate for industrialization in the 18th century. Under the Great Mughal emperors from Akbar (1556-1605) to Aurangzeb (1658-1707), the population of the subcontinent reached 165 million (compared to 100 million in Europe which had a greater area). India had a monetary economy in which bankers using sophisticated systems of double-entry bookkeeping could move money across the subcontinent. Specialist weavers were organized into workshops that produced for export to Europe and other parts of Asia. Other exports included handicrafts and bulk grains like Bengal rice (sent to Java) and Keralan rice (sent to Persian Gulf) (Bayly, 1985; Jones, 2003). The contrast between India under Akbar and England under Elizabeth I, whose reigns covered exactly the same years, is stark (Roberts, 1980, p. 42): “Akbar’s empire was one of the most powerful in the world, his court one of the most sumptuous and he and his successors ruled over a civilization more glorious and spectacular than anything India had known since the Gupta’s, while Queen
Elizabeth’s kingdom, barely a great power, even in European terms, was crippled by debt and contained fewer people than modern Calcutta.”

The problem in terms our theory was the reliance on village capital in preindustrial India. Clearly, economic relations were overwhelmingly governed by personal relations (Calkins, 1968-1969, p. 403):

“Even during the Mughal period, when the government was more centralized than at any other time before the British conquest, Mughal law enforcement seldom reached the village level. . . . [T]here was little need for the Mughals to establish such a system, since more localized and customary structures for settling disputes and keeping the peace existed almost everywhere, and operated independently of the Mughals. Intravillage disputes and infractions of local rules would be settled within the village, and disputes among members of the same caste might be settled by the caste *panchayet* or by a member of the ruling group of the area, who might also be called upon to settle village disputes.”

Local governance was optimal for most of Indian history because of the economic fragmentation of the subcontinent. India was split into a large number of nearly separate markets by poor communications and the high cost of land carriage. Few navigable rivers were available and coastal shipping only connected the peripheral areas (Jones, 2003, p. 199). Political and economic fragmentation is often considered the distinctive feature of Indian civilization before the British arrived (Morris, 1967). In our view, Indians optimally responded to the fragmentation by accumulating a large stock of village capital to manage their transactions, but the capital stock later became an obstacle to development when the barriers to integration fell away.

4. Europe

An important difference between Europe and the other three regions, in our view, was the relatively small stock of village social capital at the time when transportation and communication costs fell. To be sure, much European trade was local. However, the
geography of Europe lent itself more to long distance trade due to the unusually high ratio of navigable water routes caused by the long indented coastline and numerous navigable rivers (Jones, 2003). Population density was also constrained by the lower productivity of agriculture compared to China and India. Europe lacked the extensive alluvial deltas and river valleys of the East, and did not enjoy the high output per acre that came from rice culture (Bairoch, 1988).

As a rough quantification, Table 1 lists the population density in the four major regions in 1600 and their subsequent economic performance. As can be seen, Europe was noticeably less dense than China and India. We view density as a rough proxy for the amount of village capital under the assumption that dense social networks are facilitated by dense populations. This interpretation is supported by careful demographic evidence showing that preindustrial European households were less extensive the traditional households in China and India (Hajnal, 1982).

Europeans may also have been encouraged to develop social capital that allowed them to trade with strangers by the fragmentation of the continent into competing states. With the exception of India before the Mughals, the other three regions were unified under a single political power for centuries preceding the Industrial Revolution. The competitive environment in Europe brought forth a variety of institutional innovations friendly to economic development as the states struggled to find revenue sources to fund their armies (North, 1998). Our model suggests that fragmentation may have also had the benefit of forcing people to learn how to trade with people from different language, cultural, and political groups, much like Europeans today are likely to learn a second language. Another factor leading to the formation of social capital that facilitated trade

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17 Table 1 includes both GDP and GDP per capita. We believe that total GDP is most indicative of relative wealth for the preindustrial societies of 1600; the higher GDP per capita of Europe suggests incorrectly that the region was ahead of the others (Lucas, 2002). Either measure reveals the spectacular performance of Europe compared to the other regions over the last 400 years.

18 The idea that development is impeded by a dense population emerges from both our model and the historical evidence. It stands in contrast to an argument in the economics literature since Adam Smith that density facilitates economic growth. We believe both views are correct: density hurts in the transition to market capital, but helps once the economy is industrialized.
with strangers was the unusually large population of refugees and war exiles in Europe, such as the Huguenots from France, Greek Christians that fled the collapsing Byzantine Empire, and the Jews (Jones, 2003, pp. 119-124).

Greif (1994) contains an interesting comparison of two groups of long distance traders in the Mediterranean in the Middle Ages. The critical transaction problem for both groups involved agents who handled the merchant’s goods abroad. The tight-knit Maghribis from the Muslim world managed their agency problems using social networks to communicate and collectively punish deviators, while the European Genoese developed a legal system for the registration of contracts and established permanent courts. When opportunities arose to expand trade to previously inaccessible areas, Maghribi traders responded by employing other Maghribis as agents, while the Genoese were able to contract with non-Genoan agents. Unlike the Maghribi solution that was limited by the relatively small size of the social network (apparently only numbering in the hundreds), the Genoese solution could be applied at a large scale.

5. Japan

At first glance, Japan appears to be a notable counterexample to our theory. The island’s population was extremely dense in the preindustrial period – 49 per square kilometer in 1600, and 87 per square kilometer in the 18th century – and the importance of family there rivals China, suggesting Japan was richly endowed with village capital. According to our model, this should have created a significant obstacle for development. Yet Japan was able to industrialize following the Meiji Restoration of 1868, joining the ranks of wealthiest Western nations in the second half of the 20th century.

We conjecture that Japan was able to industrialize while other regions with extensive village capital were not because of its education policy. Village capital impedes development because it shifts the calculus of social capital accumulation away from market capital (equation (3)). One way to overcome the inertia from too much village capital is to reduce the cost of acquiring market capital. This was the deliberate strategy followed during the Meiji period. A new Western-based education system was instituted that involved, among other things, sending thousands of students to the United States and hiring more than 3,000 Westerners to teach science, mathematics, technology, and
foreign languages. While education in the preindustrial period was reserved for the rich, during the Meiji period it became universal. Primary school attendance was 98 percent for boys and 93 percent for girls in 1950. The system was also made compulsory, with a requirement of four years of schooling in 1872, six years in 1907, and 15 years by 1947. Landes (2000, p. 10) concludes, “any serious understanding of Japanese performance must build on this phenomenon of culturally determined human capital.”

6. European Colonies

European colonies also experienced a reversal of fortune over the last 500 years (Acemoglu, Johnson, and Robinson, 2002). Colonies in areas that were highly urbanized or densely populated (proxies for economic prosperity in a preindustrial world) in 1500, such as Aztec and Inca Empires, failed to modernize and were relatively poor by the end of the twentieth century. In contrast, colonies established in sparsely populated areas, such as North America, Australia, and Singapore, were early modernizers and are now among the richest nations. Acemoglu et al. (2002) suggest that colonists in densely populated areas relied on “extractive” institutions that retarded industrialization while colonists in sparsely populated areas created institutions that encouraged the general population to invest. Our analysis suggests stagnation of colonies in densely populated areas was partly a result of their preindustrial reliance on village capital. A dense village economy with a long history, such as Mexico under the Aztecs, would find it difficult to convert to market capital, while a sparse, relative new economy, such as scattered farms in the United States, would find the transition easier.

B. Resistance to Development

A defining feature of development in our approach is the replacement of village capital with market capital. Village capital is supported by and reinforces kinship, extended families, and respect for elders by the younger generation. Development, when seen as a shift in the nature of social capital, therefore changes not only income levels but

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the nature of relations between parents, children, relatives, and others in the community. If parents derive consumption benefits from their children investing in village social capital, the opportunity cost of accumulating market capital in equation (3) is higher, raising the barrier for development.

We believe the loss of consumption benefits from village social capital can explain a large part of the hostility toward “Westernization” in many traditional societies. Modern industrialization in our view is inextricably linked to destruction of the “old ways” of life. China in the 19th century tried without success to Westernize while at the same time preserving “Chinese values” (Fairbank, 1992). Modernization has been more successful in China over the last two decades, but it has been accompanied by complaints about the lack of filial piety among the younger generations. A good illustration of the resistance village capital creates for modernization are the problems faced by the British when they tried to set up Western-style courts in India in the 19th century. Individuals were pressured by village relations not to use the courts and when they did kinship relations and the weakness of impersonal obligations of civic virtue led to pervasive problems of false witness (Rudolph and Rudolph, 1965). Even in the mid-20th century, “taking disputes to the local elders is considered to be better than taking them to the urban law courts. Disapproval attaches to the man who goes to the city for justice. Such a man is thought to be flouting the authority of the elders and therefore acting against the authority of the village,” according to M.N. Srinivas (cited in Rudolph and Rudolph, 1965, p. 30).

Not all village capital generates consumption benefits, however. The Soviet Union and communist Eastern Europe industrialized using a command-and-control system that was based on village capital in the form of personal relations with bureaucrats (Levin and Satarov, 2000, p. 120): “The system of total party control taught people to seek protection in party committees and not in courts: suing was considered to be almost

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an indecent act.” Since people derive minimal consumption benefits from this type of village capital – indeed, it may even be disliked with its overtones of corruption – we would not expect deep-seated opposition to Westernization in post-communist states.

C. Other Transition Difficulties

Finally, our theory can explain some problems that arise in the transition from village to market capital. In the early stages of transition, people with village capital enter the market. Because they do not know how to use market institutions, the average market transaction becomes less efficient. Contracting becomes cumbersome, parties avoid fixed investments and long term contracts, and property rights become less secure. In general, the market seems less efficient, which it is on average, even while it expands.

Second, although we do not model it, some V-agents will continue to trade using their V-capital to support their transactions. One manifestation of this would be contract enforcement by organized crime groups. Official corruption is another (Levin and Satarov, 2000, p. 117, 120): “It is important to note that the rapid and radical changes in Russia have occurred with the majority of state officials keeping their posts. Many of those who retain their former positions are not capable of adjusting to the new market conditions. . . . Not having found formal legal protection, entrepreneurs are obliged to seek special arrangements by buying unlawful services from state officials.” The use of V-capital by criminal groups to support exchanges can be effective and even create the appearance of order, much like Chicago was seen by many to run efficiently under the patronage system of the first Mayor Daley. However, the scope of economic activity is limited when governed by V-capital. Economic progress will only pick up speed once transition economies shift to M-capital, which could take as long as a generation. Our analysis thus agrees with the conventional view that transition economies must construct market institutions, except that we would add that functional market institutions will be difficult to sustain until enough M-capital has been accumulated.
V. Conclusion

A flourishing empirical literature shows that economic development is related to social capital and adoption of market institutions such as rule of law. Yet the evidence begs the question why some countries and not others have managed to accumulate social capital and adopt the right institutions. Why do poor countries seem to have so little social capital in aggregate, even though theory suggests they are well-positioned to have it, and micro studies show they often do have it? Why have some countries been able to adopt the right institutions for industrialization while others seem trapped in village economies?

Our paper provides a theory of development that offers an answer to these questions. The theory is grounded in two ideas that have not been emphasized in the literature. The first idea is that there are two types of social capital: “village” social capital takes the form of personal relations and social networks and is effective in supporting transactions between people in the same network; “market” social capital takes the form of knowledge about commercial law, courts, and other third party institutions, and is effective in supporting transactions between strangers. The second idea is that institutions are not self-enforcing – individuals must develop skills and knowledge to use them. Industrialization, in our view, requires the adoption of market institutions such as rule of law, but those institutions are only effective if the population has the knowledge to use them.

Our answer for why poor countries seem to have so little social capital is that existing research tends to measure market social capital, such as trust in strangers. Our analysis and a great deal of micro evidence suggests that these countries would do much better if social capital were measured in terms of kinship and other personal networks, patron-client relations, and so on. Poor countries may have ample social capital, but it is the wrong kind of social capital for enforcing trades between strangers that are central to industrialization.

Our model shows that externalities in the accumulation and use of social capital make it difficult for economies to convert from one type of social capital to the other type. Village capital is efficient when most trade is local, and preindustrial societies
optimally invest in such capital. The problem is that when transportation and communication costs fall enough to make trade with strangers feasible, a large stock of human capital impedes adoption of market capital. Economies without dense social networks find it easiest to industrialize. Consistent with this idea, historical evidence suggests that industrialization emerged in Europe in the 18th century instead of the seemingly more advanced societies of China, India, and the Islamic Middle East because Europe began with the least village capital.

The premise of our analysis is that development requires both institutions and that individuals have the knowledge to use the institutions – neither is effective on its own. This suggests that the recent debate over whether institutions or human capital cause growth (discussed in Glaeser, et al., 2004) may be framed too restrictively. Our other premise that there are two types of education, and both must be considered to account for development, suggests that unidimensional metrics of human capital leave out an important part of the story.

In the service of parsimony we chose not to include in our model some factors that we think are important for development, chief among them politics. Our analysis assumes that market institutions are elastically supplied once the populace develops the skills required to use them. However, history is replete with examples where governments opposed the establishment of market institutions in order to curry favor with powerful interest groups. Our analysis suggests that members of the “older generation” may be one such group, opposing modernization in order to preserve consumption benefits from village capital, in which case politics might be driven by the stock of social capital itself.
References


The figure shows the trading location of agents with V-capital as a function of $m$, the fraction of people in the market with M-capital, and $\theta - 1$, the productivity of the market in excess of the village. All agents with M-capital trade in the market.
FIGURE 2. Relation between Aggregate Income ($\Pi$) and Market Productivity ($\theta$),
Holding Constant the Fraction of Population with M-capital ($m$)
FIGURE 3. Social Capital Transition Function

The figure shows the transition function for social capital ($m \rightarrow m'$). The two concave curves are the transition functions conditional on low ($hf$) and high ($\bar{hf}$) social capital investment. The equilibrium transition function is shaded.
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*Note.* All GDP numbers are in 1990 dollars. Total GDP is in billions of 1990 dollars. Population density is per square kilometer. Sources: GDP and GDP/capita are from Maddison (2001), population for individual countries are from McEvedy and Jones (1978), and regional aggregates are from Klasen and Nestmann (2004). “China” is China proper, that is, excluding Mongolia, Turkestan, and Tibet. “Arabia” is defined in McEvedy and Jones (2001). The density of Egypt is calculated using only the cultivated area of 35,000 km². For Arabia the 0.8M km² of the ‘Empty Quarter’ is subtracted from the land area of 2.15M km². See McEvedy and Jones (1978) for details. For the Islamic Middle East we list the four major population centers.