Did Industrialization Destroy Social Capital in Indonesia?

Edward Miguel
University of California at Berkeley and NBER
Emiguel@econ.berkeley.edu

Paul Gertler
University of California at Berkeley and NBER
Gertler@haas.berkeley.edu

David I. Levine
University of California at Berkeley
Levine@haas.berkeley.edu

June 2002

Abstract: This paper examines the effect of industrialization on social capital in Indonesia during 1985 to 1997 using repeated cross-sections of nationally representative surveys. We analyze a rich set of social capital measures including multiple measures of voluntary associational activity, levels of trust and informal cooperation, and family outcomes. There are three main findings. First, districts that experienced rapid industrialization showed significant increases in most social capital measures. Second, districts that neighbor rapidly industrializing areas exhibited high rates of out-migration, significantly fewer community credit cooperatives, and a reduction in "mutual cooperation" as assessed by village elders. Finally, initial social capital in a district did not predict subsequent industrial development. We present a model of social capital investment and migration consistent with these patterns. The empirical findings challenge existing results in the social capital literature, and may have implications for social instability in Indonesia since 1997.

Acknowledgements: We are grateful to the Bureau of Statistics of the Government of Indonesia for providing access to the data, and to the U.C. Berkeley Center for the Economic Demography of Aging (CEDA) and the U.C. Berkeley Clausen Center for funding. We are also grateful to Garrick Blalock, Esther Duflo, Maya Federman, K. Kaiser, and Jack Molyneaux for sharing data with us. We would like to acknowledge Robert Akerlof, Kok-Hoe Chan, Fitria Fitrani, and Sebastian Martinez for excellent research assistance, and are grateful to George Akerlof, Gillian Hart, Michael Kremer, Ronald Lee, and seminar participants at U.C. Berkeley, Harvard University and the World Bank for useful comments. The usual disclaimer applies.

1. Introduction

Social institutions affect a wide array of economic outcomes, ranging from informal credit, insurance, contracting, and local public good provision.[1] These "features of social organization, such as trust, norms, and networks, that … facilitate coordinated actions" (Putnam 1993: 167) are increasingly called "social capital."[2] Yet while social scientists have recently paid increasing attention to the effects of social capital, the process of social capital creation and destruction remains poorly understood.[3]

This paper explores one facet of this issue, the effect of industrialization on social capital. We examine changes in social capital across Indonesian districts during 1985 to 1997, a period of rapid industrial development in which real per capita income grew by an impressive seventy percent (World Bank 2002). This is the first study, to our knowledge, to explore this question using panel data from nationally representative surveys. Examining industrialization within a single country – with its shared survey instruments, legal framework, history and political institutions – eliminates many of the omitted variables that bias cross-country regressions.

Social scientists have long been concerned with how industrialization transforms society. Polanyi (1957 [1944]: 129) expressed a pessimistic view of the effects of the 19th century British Industrial Revolution, which had produced "social dislocation of stupendous proportions" and "wreaked havoc with [workers'] social environment, neighborhood, [and] standing in the community". Marx and Engels (1964 [1848]: 63) asserted that the "constant revolutionizing of production, uninterrupted disturbance of all social relations, everlasting uncertainty and agitation distinguish the … [this] epoch from all earlier ones." Regarding Indonesia, Cribb and Brown (1995: 148-149) write that the economic boom and resulting large-scale migrations led to "an increasingly rapid rate of corrosion of the long-standing social and moral ties which bound agricultural communities together", and Breman (2001: 260) argues that "the village on

[1] Refer to Besley, Coate and Loury (1993), Greif (1993), Udry (1994), Alesina, Baqir and Easterly (1999), and Miguel and Gugerty (2002) for contributions in this literature.
[2] Refer to Coleman (1990) and Putnam (1993) for the seminal work on social capital.
[3] There are a few notable exceptions to this generalization including Gugerty and Kremer (2002) who explore how donor assistance affects community groups in rural Kenya, and DiPasquale and Glaeser (1999).

Java can less than ever before be characterized as a homogeneous peasant community. … The social fabric within the local community is both looser and more contractual than previously". Contemporary anti-globalization writers echo related themes (Ciscel and Heath 2001, Danaher 2001). But not all researchers share this gloomy view of development. For example, Putnam (1993: 180) claims that "norms and networks of civic engagement contribute to economic prosperity and are in turn reinforced by that prosperity".

This paper helps to make sense of these conflicting views of industrialization. We first present a stylized theoretical model building on existing work by Glaeser, Laibson and Sacerdote (2000) and Cutler and Glaeser (1997). Industrialization leads to migration from non-industrializing areas towards areas with plentiful manufacturing employment. This migration in turn weakens mutual assistance groups that provide credit and insurance, groups in which intertemporal reciprocity is the foundation of organizational activity. Simply put, individuals choose not to invest in social capital when they are likely to out-migrate before reaping a return on that investment. Young and well-educated individuals, who are most likely to invest in social capital in the absence of migration, also have the best employment prospects and thus highest migration rates to industrializing areas, and this migration further erodes social capital in non-industrial areas. At the same time, plentiful manufacturing employment reduces out-migration from the industrializing regions; thus, residents there have stronger incentives to invest in social capital.

We then use Indonesian household, firm, and village level nation-wide surveys to create a panel dataset of 274 districts for the years 1985 to 1997, and examine the impact of industrial development on social capital. The dataset contains a uniquely rich set of social capital measures that we divide into three broad categories outlined in the existing literature (Fukuyama 2000; Putnam 1995): the density of voluntary community associational activity, levels of trust and informal cooperation, and the quality of family relations. In the empirical analysis, we include district fixed effects to capture time-invariant unobserved heterogeneity across districts, as well as community geographic characteristics as explanatory variables to partially control for other factors that could affect social capital.

The empirical analysis yields three important results. First, rapidly industrializing districts

showed *increases* in most social capital measures, including more non-governmental credit cooperatives and community recreational groups, and more spending on local festivals and ceremonies. Local industrialization was also associated with a higher rate of elderly co-residence with children, and with less divorce, which runs against accepted wisdom in Demography (Cowgill 1974; Ruggles 1997).

Second, industrialization in nearby areas reduced social capital. The migration of millions of young Indonesians from rural areas to nearby factory jobs appears to have reduced social capital in the districts they left. Industrialization in nearby districts is associated with fewer credit cooperatives and a decline in "mutual cooperation" as measured in surveys. Geographic positioning system (GPS) data allows us to construct measures of "nearby" industrial change within a certain distance of each district capital that cuts across province boundaries. Our third main result is that high initial social capital levels did *not* predict subsequent industrial development in Indonesia.

Taken together, these results challenge recent claims in the growing literature on social capital and economic development. Our finding that rapidly industrializing districts had more community associational activity in Indonesia – together with the result that initial social capital did not foster industrialization – runs against recent studies which claim social capital promotes economic development and income growth (e.g. Grootaert 1999; Narayan and Pritchett 1999; Knack and Keefer 1997; Putnam 1993). In contrast, our results suggest that the positive cross-sectional relationship between social capital and income found in these is likely to have been driven by the impact of industrial development on social capital – rather than the other way around. We return to this theme in the conclusion.

The paper is structured as follows. Section 2 defines social capital and discusses how we measure it in Indonesia. Section 3 describes existing theories of industrialization and social capital and presents a formal model illustrating the key channels in Indonesia. Section 4 describes the identification strategy and Section 5 discusses the empirical results. In Section 6, we discuss the limitations of the results, and explore how they may relate to recent social instability in Indonesia.

2. Social Capital in Indonesia

2.1 Existing Theories of Social Capital

A number of theories provide the micro-foundations for understanding social capital, including theories of mutual insurance (Ligon, Thomas and Worral 2001), altruism, social norms (Hechter 1987), and reciprocity in games of repeated play (Fudenberg and Maskin 1986). These theories suggest that social capital is greater when individuals are embedded within a dense network of social ties so that cooperation can be monitored and rewarded by others, or when there is affection amongst individuals that promotes altruism and expectations of future reciprocity. These theories also stress the importance of long-term relationships and expected future encounters. Long-term relationships provide incentives for cooperative behavior today and the time needed to internalize group norms and form bonds of affection.[4]

2.2 Measuring Social Capital in Indonesia

What factors, then, lead to dense networks and long-term relationships? Consider the following idealized society with very high levels of social capital: a tradition-bound village with a stable set of families that have lived together for generations. Religious observations, agricultural production, local public goods projects, and socializing all involve the same individuals, and frequent interactions create a dense network of social ties. Transactions in this setting are more often performed based on reciprocity than money transfers, relatives and neighbors are crucial sources of assistance after adverse shocks, such as illness or poor harvests, and good information allows residents to easily detect shirking.

Much of the daily life of ordinary Indonesians revolves around institutions that facilitate such dense social interactions. Indonesian communities are typically characterized by vibrant organizational life, including financial self-help groups, farmers groups and water groups (Lont 2000).[5] Many community organizations in both rural and urban Indonesia were originally based on informal rotating savings and credit associations (ROSCAs) called *arisan* in Indonesian, and larger credit cooperatives

[4] For a general critique of the social capital literature, see Sobel (2002).

[5] This is despite the brutal anti-communist campaigns of the late 1960s, in which community groups and non-governmental organizations with real or suspected communist ties were destroyed and their members killed.

often retain a rotating structure (Eldridge 1995); such rotating credit groups have received extensive attention in the social capital literature (Putnam 1993). Eldridge (1995: 53) describes a typical Indonesian community self-help group:

> Local income-generation programs operated by small local groups, either independently or in association with some larger [NGO], are fairly pervasive in Indonesia, most commonly in the form of informal or formal co-operative enterprises, *arisan*, savings and loan groups, and credit unions. … Perhaps the most creative mode of income generation … is the revolving fund. This practice is commonly associated with small, informal co-operatives, which are often built on traditional-style associations such as *arisan*. … This process obviously depends on efficient organization and high levels of mutual support and reciprocity."

Social capital measures are found in a variety of data sources collected by Indonesia's Central Bureau of Statistics (BPS), including the PODES community (*desa*) survey, and the SUSENAS and SUPAS household surveys, as well as the Indonesian Family Life Survey (IFLS). The Data Appendix describes each dataset in detail.

Community Groups

The decade we study witnessed a period known as *Keterbukaan* ("Openness") in which national non-governmental organizations (NGOs) flourished. A defining characteristic of many NGOs was their goal of encouraging the formation of community groups affiliated with the larger organization. Despite the political centralization of the Indonesian New Order regime (1966-1998), "significant independent group formation sponsored by NGOs was occurring in a variety of micro contexts. This was made possible by defining such activity as developmental rather than political" (Eldridge 1995: 28).

One such national NGO was Bina Swadaya, which claims to have set up over 18,000 community groups throughout the country since the 1970s. Groups typically have twenty to fifty members and work in credit, irrigation, family planning and agriculture. These local "chapters" – such as the Farmer Water Users' Association (P3A), a group in our dataset – followed the Bina Swadaya organizational template in terms of record keeping and group structure. Improvements in transportation and communications that

accompanied industrialization facilitated this organizational diffusion in both rural and urban areas. [6]

Much of the expansion occurred in industrializing areas among manufacturing workers, as well as among individuals working in the informal sector, such as street hawkers. The case of the Foundation for Labor Advancement (YBK) illustrates (Eldridge 1995: 81):

> [YBK credit] repayments are collected at weekends, thus bringing people together naturally for other social and informal purposes. Youth groups organize periodic working parties to clean up the neighborhood. … [YBK] involvement with village and religious authorities has also brought significant improvements in basic services, such as local roads, clean drinking water, and health education. Sports for young people and entertainment for children are also organized.

Beyond this non-governmental activity, there is also a quasi-governmental group – the Village Cooperative Unit (KUD) – in our dataset. Grootaert (1999: 52) argues that "a key feature of the Indonesian institutional landscape is the active role which the central government played in promoting and shaping local associations and their interactions with different levels of government". However, many quasi-government groups suffered from reputations of mismanagement and corruption and it is unclear to what extent their expansion actually reflects local social capital (Eldridge 1995: 68).

Informal Social Capital

Community group data captures relatively formal expressions of social capital. Some authors have recently argued that it is preferable to focus on formal organizations, rather than informal interactions, because "associations are undoubtedly a much more robust form of sustained and effective civic interaction between individuals" (Varshney 2002: 45). Nonetheless, it remains possible that industrialization is associated with a shift towards formal forms of cooperation, but not meaningful changes in underlying social capital. For example, in a small village with high social capital, organized

[6] There are clear parallels with the U.S. experience of organizational diffusion during rapid industrialization. Skocpol et al. (2000) present evidence from the U.S. in the late 19th and early 20th centuries, also a period of industrial transformation and large-scale migration, and find that "at the height of local proliferation, most voluntary groups were part of regional or national federations." Rather than simply reflecting local organizational proclivities, the spread of local voluntary organizations in the U.S. – as in Indonesia – appears to have relied heavily on the organizational activities of large national NGOs. In the U.S. these organizations included the American Bowling Congress, the YMCA, the Grange, and fraternal groups like the Knights of Columbus, among others.

sports leagues may be unnecessary because neighborhood children already play together informally.

To address such concerns, we also employ measures of informal social capital. Though no single measure can adequately capture all one might mean by informal social capital, taken together these measures fill in some of the gaps. The first measure of informal social capital is the proportion of per capita expenditures on festivals and ceremonies from the SUSENAS household survey. Intuitively, communities with frequent festivals are likely to have closer social connections. Breman (2001: 261) argues that such expenditures are likely to be a good measure of underlying social capital because "the cycle of rituals and festivities … give meaning and articulation to the collective dimensions of a locality". The second measure is derived from the traditional customs and law (*adat*) module of the 1997 Indonesia Family Life Survey[7]. In 270 rural enumeration areas, village chiefs identified a local expert in *adat*, and these experts were asked to state whether a particular norm had held in traditional law and whether it remained common practice at the time of the 1997 interview. These responses are best thought of as the opinions of influential community members.[8] The *adat* survey instrument contains one question directly related to social capital, the extent of an "ethic of mutual cooperation" in the community, which takes on a value of one if there is cooperation and zero otherwise.

Family Outcomes

Many authors have argued for the inclusion of family ties within the overall social capital framework, including Costa and Kahn (2001) and Putnam (1995: 73), who argues "the most fundamental form of social capital is the family". Even if one feels that family outcomes should not be considered social capital measures, they represent important outcomes in their own right and are thus included in this study.

The first family outcome is elderly co-residence with children. For our purposes, the elderly are

[7] For more on IFLS, refer to Frankenberg and Thomas (2001).
[8] The selection process of *adat* respondents is not transparent (and very few women were included, for example). The "past" is also a vague concept, open to multiple interpretations. Finally, since only one person was interviewed per community, there is no way to validate their opinions. Nonetheless, this unique dataset provides important insights into social change in Indonesia.

defined as those at least sixty years old. Co-residence with children often constitutes an important form of insurance for the elderly and may proxy for the strength of social ties within families. Cowgill (1974) and other modernization theorists in Demography have extrapolated from the Western experience to claim that industrialization leads to less elderly co-residence with children. For example, high migration rates could split up extended families, and traditions of elderly care may lose currency during the social transformations that accompany industrialization. In this paper, we move beyond the cross-national comparisons common in the demography literature and examine how industrialization affected elderly living arrangements using SUPAS household survey data.

We also examine the effect of industrialization on the divorce rate, another measure of social ties within families. Heaton et al. (2001) describe how "until relatively recently, the Muslim populations of Southeast Asia had among the highest divorce rates in the world. The general divorce rate - the number of divorcees per 1,000 persons aged 15 and over - was 15.1 … more than four times the general divorce rate in the United States." Traditionally, there was little stigma attached to divorce in Indonesia and arranged marriages were common, and in many cases, especially if the bride was quite young, the couple did not consummate the marriage (Jones 1994). From the 1940s to the 1990s, however, the divorce rate declined by approximately sixty percent overall, and the average age of first marriage increased.[9] The trend may be associated with the increasingly orthodox nature of Indonesian Islam that has emerged in recent decades (Cribb and Brown 1995), though legal changes in 1974 also made divorce more difficult (Heaton, et al., 2001). There are complicated gender equity issues involved in determining whether reductions in divorce should be considered socially desirable.

3. Theories of Industrialization and Social Capital

In this section, we first outline possible channels linking industrialization and social capital found in the

[9] By way of contrast, the proportion of all marriages ending in divorce *increased* dramatically in the United States during industrialization, from five percent of all those married in 1867 to 50 percent in 1967 (Ruggles 1997).

existing literature: migration, rising income, and inequality (Section 3.1). We then formalize the main arguments in a stylized model of social capital investment and migration related to Glaeser, Laibson and Sacerdote (2000) and Cutler and Glaeser (1997) to generate testable empirical hypotheses. This model highlights only some of the many proposed mechanisms linking industrialization and social capital; the main goal of this paper is to lay out key ideas and let the data speak.

3.1 Channels Linking Industrialization and Social Capital

Migration

Out-migration strains existing social ties (Schiff 1998). For example, out-migration threatens rotating credit groups because those who contribute money to the common fund today cannot be sure they will be repaid in the future. When group members move to take jobs in other districts, the informal social sanctioning mechanisms that sustain ROSCAs become less effective and cooperation may unravel (Besley, Coate and Loury 1993; Routledge and von Amsberg 2002). In the United States, DiPasquale and Glaeser (1999: 4) find that "homeownership positively influences the formation of social capital, and much of the influence of homeownership occurs because homeownership increases community tenure"; simply put, renters choose not to invest in social capital since they will not be around to reap the returns.

Out-migration also may weaken social capital because migrants tend to be drawn from the same demographic groups – the relatively young and well-educated in Indonesia – that create the most social capital. These individuals have the best formal sector employment opportunities elsewhere, and are thus most likely to migrate. In-flows of such individuals into industrializing areas may increase social capital investment in these areas. This is related to a point made by Cutler and Glaeser (1997), namely that skilled individuals may gain more from increased residential mobility than the unskilled (as a result of U.S. racial integration in their case), with potentially negative effects for those left behind.

However, in-migration may also lead to lower levels of social capital if new migrants, who may be ethnically and linguistically distinct, find it more difficult to integrate into pre-existing community

social networks. Members of the same ethnic or religious group are more likely to interact frequently in social settings, which increases trust and cooperation. Reputations also spread quickly within tight-knit groups, allowing for more effective social sanctions against those who break norms. A number of studies find that self-reported trust in others and the provision of local public goods are substantially lower in more ethnically diverse communities (Alesina Baqir, and Easterly 1999; Alesina and La Ferrara, 2000; Miguel and Gugerty 2002).

In-migration may also reduce social capital through increased population density and urbanization, which is typically associated with greater anonymity. If a greater proportion of people work outside their urban neighborhood than work outside their rural village, dense overlapping social networks may never form. On the other hand, higher population density could also create the critical mass necessary for the existence of collective institutions for small groups (e.g., the Chinese in Indonesia).

Income Growth and Inequality

The existing theoretical literature suggests that income growth can have positive or negative effects on social capital investment. On the positive side, most forms of social capital are probably normal goods.[10] Indeed, Eldridge (1995: 68) claims that households from the poorest strata of Indonesian society are less likely to participate in financial self-help groups than somewhat better-off families. Glaeser, et al. (2000: 816) present evidence from the United States that "trust is much higher among richer and well-educated individuals".

On the other hand, income growth may reduce social capital investment. Growing incomes make social sanctions less effective as individuals become less dependent on their community. For example, Ligon, Thomas and Worral (2001) model how the wealthy may opt out of mutual insurance arrangements, weakening informal insurance networks. These effects may be particularly salient when income inequality increases. At the same time, the poor may more successfully avoid oppressive social norms

[10] However, at very high levels of income, certain manifestations of social capital may be inferior goods (e.g., informal savings and credit mechanisms).

once incomes and outside opportunities improve, even at the cost of weakening traditional ties. Kranton (1996) describes how greater access to the market economy can reduce the benefits of informal reciprocal exchange because individuals more easily find impersonal trading partners. High wages also increase the opportunity cost of time, which could reduce investment in time-intensive forms of social capital.

Theories of Reverse Causality

Some forms of social capital could promote industrialization.[11] Indeed, Putnam (2000) emphasizes that norms of reciprocity and trustworthiness are essential for economic growth, and that dense social networks help maintain such norms. Networks of mutual obligation may also encourage entrepreneurship; for example, individuals may be more willing to undertake efficient but risky projects if there exists a strong community or family safety net. Informal financial institutions based on social capital, including rotating savings groups, may provide an important source of investment.

However, if traditional norms impede efficient transactions – for example, by restricting the ability of women to work in factories, or other forms of discrimination against particular groups – then industrialization may in fact be slowed (Akerlof 1976; Platteau 2000). In fact, Geertz (1963) argued that traditional forms of Javanese social capital were likely to produce continued economic stagnation by stifling saving and investment.

3.2 A Theory of Industrialization, Migration and Social Capital

We present a stylized theoretical framework of social capital investment that formalizes two channels that are particularly salient in the Indonesian context: migration and income growth.

[11] Social capital may also affect welfare through other channels, including better governance and a feeling of individual "belonging" to a community, but we focus on industrialization in this paper.

Model Set-up

There is a continuum of agents of measure one in each of two districts *d*, $d \in \{A, B\}$. A proportion *P* of agents in each district are "high types" (*i=H*) and the remaining *1 – P* of agents are "low types" (*i=L*), where *H > L*. The *H* types should be thought of as young and better-educated adults. Income for a type *i* individual in district *d* is given by $Y_{id} = iY_d$, so in a given district high types always earn more income than low types, and the gap between the two types is increasing in the level of industrialization, Y_d. Each individual of type *i* in district *d* allocates her income between private consumption, C_{id}, and social capital investment, S_{id} (e.g., contributions to local community groups) such that $Y_{id} = C_{id} + S_{id}$. There are two key choices facing individuals: first, the amount to invest in social capital, and second whether or not to migrate to the neighboring district. We make a distinction between "local" industrialization (for example, industrialization in one's district) and "nearby" industrialization (industrialization within a certain distance of the district).

We first discuss the model without migration as a benchmark to illustrate the social capital investment decision, and then extend the model to include migration.

The Static Model without Migration

Consider the case without migration. Utility for an individual of type *i* in district *d* is:

(1) $$U_{id} = V(C_{id}) + R(S_{id}, \overline{S_d}, i)$$

$\overline{S_d}$ is the average level of social capital investment in district *d* (among both the high and low types born in that district), *V* is a standard increasing and weakly concave function of consumption, and *R* is the non-negative return to social capital investment.

Assumption 1:

(a) Social capital returns are increasing and weakly concave in individual social capital investment, average local investment, and agent type: $R_1 > 0$, $R_{11} \leq 0$, $R_2 > 0$, $R_{22} \leq 0$, $R_3 > 0$, $R_{33} \leq 0$

(b) Individual social capital investment and average local investment are complements: $R_{12} > 0$. Moreover, social capital returns are zero if individual investment is zero: $R(0, \overline{S_d}, i) = 0$.

(c) Individual social capital investment and agent type are complements: $R_{13} > 0$.

Assumption 1(a) is standard. Assumption 1(b) is the key assumption, and implies that it is worthwhile investing in social capital only if other community members are also investing; that is, there are network externalities. As Sobel (2002: 143) puts it, "if there are no clubs, then there are no clubs to join." More generally, larger groups provide better credit and insurance opportunities, and it may be more fun socially to join a larger group. As we show in the next sub-section, this strategic complementarity implies that individuals who do not intend to out-migrate may reduce their investment in social capital in response to lower anticipated investment by individuals who plan to migrate. Finally, Assumption 1(c) implies that high types enjoy larger returns from their investment.

Individuals take average local social capital investment $\overline{S_d}$ as given when they make their investment choice. The following first order condition determines social capital investment:

$$V'(iY_d - S_{id}) = R_1(S_{id}, \overline{S_d}, i) \tag{2}$$

It follows directly from Assumption 1 that individual social capital investment is increasing in local industrialization, in average local social capital investment, and in individual type.

We focus on symmetric Nash equilibria, outcomes in which all individuals of type *i* in district *d* make the same investment. For simplicity, we restrict attention to functions *R* and *V* such that there are no multiple equilibria in social capital investment and no investment corner solutions, although these assumptions could be relaxed without changing the essence of the results.[12] It then follows from Assumption 1 and Equation 2 that social capital investment is increasing in both local industrialization,

[12] We rule out multiple equilibria by restricting attention to functions *R* and *V* generating individual social capital investment reaction functions that everywhere have slope less than one; in this case, there is a unique fixed point solution to the investment problem. A simple example that satisfies the condition is $R(S_{id}, \overline{S_d}, i) = S_{id}(\lambda + \overline{S_d})i$ (for $\lambda \geq 1$ and $H > L \geq 1$) and $V(C_{id}) = \ln(C_{id})$. Refer to Cooper and John (1988) for a more general discussion, and to Banerjee and Newman (1998) and Carrington et al. (1996) for related models of migration.

Y_d, and in individual type i (proofs available upon request).

The Dynamic Model with Migration

We now extend the model to include migration, in a set-up with four time periods. Unlike the previous case, districts are subject to industrialization shocks observed in period 1 and realized in period 4. Between the announcement and realization of the shocks, agents choose their social capital investment (period 2) and whether to migrate between the two districts, *A* and *B* (period 3).[13] Without loss of generality, the industrialization shock is larger in district *A*. The benefit of migration to a rapidly industrializing district is higher income in period 4. Migration costs come in two forms, first, a fixed cost (F), and second, the loss of social capital investment returns in the home district. We also assume that migrants have zero social capital in their new district. To reduce notation, we further assume that V is linear.[14] The timing in the four periods is:

> t = 1: Initial industrialization is the same in both districts, at Y. Industrialization shocks (Y_A, Y_B) are announced. The support of the shocks is bounded, $Y_d \in [\underline{Y}, \overline{Y}]$ for $d \in \{A, B\}$.
>
> t = 2: Individuals choose social capital investment, S_{id}, and their choices are publicly observable.
>
> t = 3: Individuals choose whether to migrate to the neighboring district, $M_{id} \in \{0,1\}$. If an individual migrates, she pays fixed cost F and loses the return on her social capital investment. [15]
>
> t = 4: Individuals consume income and receive the social capital return.

Given this structure, utility for a type i individual born in district d is:

$$U_{id} = (iY - S_{id}) + (1 - M_{id})\left\{iY_d + R(S_{id}, \overline{S_d}, i)\right\} + M_{id}\left\{iY_{d'} - F\right\} \tag{3}$$

Solving by backwards induction, in period 3 individuals (who already know the industrialization

[13] Migration will affect wages in both districts, but we abstract away from general equilibrium labor market effects in what follows for simplicity and assume a fixed wage gap between the two areas.
[14] This assumption eliminates the income effects on social capital investment discussed in the previous subsection. Note that results are weakened for V sufficiently concave.
[15] Results are similar if migrants retain a fraction of the return on their investments, due to moving to an enclave from their home district, circular migration, or partial insurance in the home area.

levels to be realized in period 4 and have sunk their social capital investments) migrate if:

$$Y_{d'} - Y_d \geq \frac{R(S_{id}, \overline{S_d}, i) + F}{i} \quad (4)$$

Since wages are always higher in district *A*, migration will only flow from district *B* to district *A*. Individuals in district *B* are more likely to migrate the larger the wage gap, for smaller mobility fixed costs, and if they expect a smaller social capital return. We assume that low types never migrate due to their smaller potential gains from migration (we present evidence from Indonesia in Section 5 below to justify this assumption).[16]

Assumption 2:
Low types never migrate, but high types may migrate: $\frac{F}{H} < \overline{Y} - \underline{Y} < \frac{F}{L}$

All equilibria can now be characterized by the proportion of district *B* high types who choose to migrate to district *A*; we call this proportion π. Since the return to social capital in district *B* is decreasing in the proportion of high types who leave district *B*, this is a "tipping" model along the lines of Schelling (1978) and there are only two stable rational expectations equilibria: either all high types migrate to district *A* ($\pi = 1$) or no high types migrate ($\pi = 0$).[17] We denote social capital investment by type *H* (*L*) agents in a district where all agents expect there to be no out-migration ($\pi = 0$) as S_H^* (S_L^*).[18] When all *H* individuals are expected to migrate to district *A* ($\pi = 1$), any *H* (*L*) type who does remain in district *B* would optimally invest S_H^{**} (S_L^{**}) in social capital in period 2. It follows from Assumption 1(b) that individual social capital investment is greater when a larger proportion of individuals is expected to

[16] This assumption could be relaxed – by allowing low types to be simply *less likely* than high types to migrate in search of higher wages, for example – without changing the main insights.
[17] Migrants do not take into account the externalities their decisions have on those who remain in district *B*. Since outcomes may not be optimal from the point of view of aggregate welfare, it is possible that imposing greater mobility costs could increase welfare (Routledge and von Amsberg 2002). As is standard, we assume all individuals have common expectations on π when they make investments.
[18] The linearity of *V* implies that S^*_H (S^*_L) is the same for all district industrialization levels (as long as individuals expect $\pi = 0$). Assumption 1(c) implies that $S^*_H > S^*_L$.

remain in the district, or formally, $S_H^* > S_H^{**}$ and $S_L^* > S_L^{**}$.

The industrialization gap between the districts determines which migration outcome occurs. When the gap is sufficiently large, all district *B* high types migrate to district *A* ($\pi = 1$), and income levels, income inequality, in-migration, and social capital investment are all higher in the rapidly industrializing district, district *A*. Income inequality is higher in district *A* because district *B* is left with only low types, while there are both high and low types in district *A*.[19] In this case, high types invest more than the low types in social capital in district *A*, but in district *B*, the high types – all of whom expect to out-migrate – invest zero in social capital while only the low types make positive social capital investments. In contrast, when the industrialization gap is small, there is no migration and social capital investment is identical in both districts, though average income remains somewhat higher in the more rapidly industrializing district.[20] These findings are presented in Result 1.

Result 1:

(a) For "large" industrialization shocks, $Y_A - Y_B \geq \frac{R(S_H^*, PS_H^* + (1-P)S_L^*, H) + F}{H}$, all *H* individuals from district *B* migrate to district *A* ($\pi = 1$). Income levels, income inequality, and average social capital investment are strictly higher in district *A* than in district *B*.

(b) For "small" industrialization shocks, $Y_A - Y_B < \frac{R(S_H^{**}, (1-P)S_L^{**}, H) + F}{H}$, no *H* individuals from district *B* migrate to district *A* ($\pi = 0$). Income levels are higher in district *A*, but average social capital investment and income inequality are the same in the two districts.

As the model is set up, the in-migration of high types does not increase social capital investment in district *A* because migrants do not have the opportunity to invest in social capital in their new district. However, one could extend the model to an additional period, in which case the fact that district *A* now has a disproportionate number of high types would lead to even greater social capital investment there over the medium term.

[19] This finding on income inequality may not generalize to all initial income distributions in the two districts, and hence may not be as robust as the other results.

[20] There is also a third region in which the industrialization gap is intermediate and either equilibrium is possible. In this range, the outcome is determined by agent expectations, due to the "tipping" nature of the model.

4. Empirical Methods

We estimate the effect of industrialization on social capital outcomes using repeated cross-sections of communities and households in Indonesia. We focus on reduced-form models that do not separately identify each of the possible theoretical channels described in Section 3. As discussed above, many theoretical channels linking industrialization and social change are plausible, including migration, income growth, income inequality, as well as changing views on traditional norms. In practice, these factors are likely to interact in multiple and complex ways, making the reduced-form specification a reasonable empirical approach. Although we do not explicitly test a structural model, we do examine the relationship between industrialization and several mediating channels that figure in the theoretical discussion, and these results motivate key assumptions in the theory.

The reduced-form econometric model assumes that industrial development in a district, as measured by the proportion of manufacturing employment ($Manufacturing_{dt}$) and the level of industrial development in nearby districts ($Nearby\ Manufacturing_{dt}$), determines the current level of social capital. Equation 5 presents this specification:

$$(5) \qquad Social\ Capital_{idt} = a_t + b_1\ Manufacturing_{dt} + b_2\ Nearby\ Manufacturing_{dt} + X_{idt}'\ c + Z_{dt}'\ f + u_d + e_{idt}$$

The coefficient estimates of b_1 and b_2 are our primary focus. $Social\ capital_{idt}$ denotes a social capital outcome, such as the number of community groups, in community i in district d at time t (though in household-level analysis, i refers to households). There are multiple social capital outcomes in the dataset, but for expositional clarity we drop the subscript denoting each type of outcome in this section. The X_{idt} variables are characteristics of the community or household that affect social capital, while Z_{dt} are characteristics of the district that affect social capital. The term a_t is a time indicator variable, and u_d is a district random effect capturing unobserved time-invariant district characteristics that affect social capital,

for example, local culture and history. Finally, e_{idt} is the disturbance term.

Omitted variable bias is a serious concern in the cross-sectional regression: estimates of b_1 and b_2 using cross-sectional data will be biased if unobserved determinants of social capital (u_d) are correlated with the level of industrial development. However, to the extent unobserved district factors that affect social capital are persistent over time, then adding district fixed effects, as in Equation 6, generates unbiased estimates:

$$(6) \qquad \textit{Social Capital}_{idt} = a_t + b_1\, \textit{Manufacturing}_{dt} + b_2\, \textit{Nearby Manufacturing}_{dt} + X_{idt}'\, c + Z_{dt}'\, f + (\textit{District fixed effect})_d + e_{idt}$$

With two periods of data, which we have, this is closely related to a first-differences specification.[21]

We also present a third specification that uses the difference in local and nearby manufacturing ($\textit{Manufacturing}_{dt} - \textit{Nearby Manufacturing}_{dt}$) as the key explanatory variable. The advantage of this approach is that it ties the estimation equation more closely to the theoretical model in Section 3, though in general we prefer the more flexible specification in Equation 6.

$$(7) \qquad \textit{Social Capital}_{idt} = a_t + b_3\, (\textit{Manufacturing}_{dt} - \textit{Nearby Manufacturing}_{dt}) + X_{idt}'\, c + Z_{dt}'\, f + (\textit{District fixed effect})_d + e_{idt}$$

Despite the inclusion of district fixed effects, estimates of b_1, b_2, and b_3 will be biased if we omit time-varying variables that affect both industrial development and social capital. For example, the construction of a major highway running through a district, electrification, or primary school construction could conceivably both increase investment in manufacturing and also affect the success of community organizations. However, in Table 2 below, we find that neither roads, electricity, nor school construction predict subsequent industrialization, ameliorating concern over this potential source of bias. We also

[21] We are unable to match communities or households across surveys rounds for the PODES, SUPAS, and SUSENAS datasets, which leaves us with repeated cross-sections rather than a true panel, and forces us to use district fixed effects rather than community or households fixed effects.

include community geographic controls in some specifications – including being land-locked, altitude, and village area – to address potential omitted variable bias because the omitted time-varying factors may be common within regions that share certain geographic features. Although we cannot completely rule out the possibility of bias due to other omitted time-varying factors, we do not believe that there remain unobserved time-varying factors that can plausibly explain both massive industrial transformation and rapid social institutional change in Indonesia during this period.

Manufacturing in nearby districts may generate a variety of spillovers on social capital outcomes. For example, migration to rapidly industrializing areas may weaken rural organizations in the migrant-sending regions, as in the theoretical model, or individuals may adopt the "modern" attitudes, organizational forms, and family practices originating in nearby industrial areas.[22] In the presence of mobility costs that limit migration across large distances, the proper measure of "nearby" industrialization may be among districts located within a certain distance of the district capital (we typically use 200 kilometers, although we also experimented with other distances), or for other districts in the same province; we use both in the empirical section and find that the correlation between both measures is high (at 0.75), and the empirical results are similar in either case. The median district capital is located within 200 kilometers of fifteen other districts capitals.

We use data from each survey as close as possible to the years 1985 and 1995 in order to examine changes over roughly a decade for both social capital and industrialization. We drop the former province of East Timor and the province previously known as Irian Jaya (before its recent division and subsequent name changes). We also combine districts that merged or split to reformulate them into the largest unit consistently defined from 1985 to 1995. The resulting dataset contains complete industrialization information for 274 districts.

Disturbance terms may be correlated among nearby districts due to common policy choices,

[22] It is also possible that industrialization at the national (or even international) level leads to cultural change even in areas completely untouched by industry. In this case, the estimated effects from equations 5, 6, and 7 serve as lower bounds on true effects, since average national effects are captured in the year indicator variables.

political leadership, weather, and ethnic or religious influences. We adjust standard errors to correct for this possibility in two ways. First, we allow for a common random effect across all communities or individuals within the same province in a given year, using clustered standard errors. Second, we also allow disturbances to be correlated across districts as a general function of distance (using data on district capital latitude and longitude) in certain specifications using the generalized method of moments estimator in Conley (1999).[23] Standard errors are similar with both methods.

4.1 Where Do Factories Locate? Ruling Out Reverse Causality

We also examine the relationship between initial levels of social capital and subsequent industrial change. These regressions help establish the extent to which manufacturing employers sought out high social capital areas in which to invest, and thus the possible extent of reverse causality. This specification is presented in Equation 8, where we use initial social capital (subscript "0" represents initial conditions), district characteristics (Z_{d0}) and manufacturing to predict the growth of manufacturing employment in the district (although we also exclude initial manufacturing in some specifications):

$$(8) \qquad \Delta\, Manufacturing_d = \alpha + \beta\, Social\ Capital_{d0} + Z_{d0}'\gamma + \delta\, Manufacturing_{d0} + \varepsilon_d$$

5. Results on Industrialization and Social Capital

5.1 Summary Statistics

Table 1 presents district-level summary statistics. Manufacturing employment as a share of the full-time economically active population (those unemployed or working over 20 hours per week) grew sharply from 6.3 to 13.1 percent. To control for possible changes in labor force participation due to industrialization, we focus on the change in manufacturing employment as a share of total adults in the

[23] Following Conley (1999), spatial standard errors are calculated with a weighting function that is the product of a kernel in each direction (North to South, East to West); the kernels start at one and decrease linearly until they are zero at 600 kilometers from the district capital, although results are robust to varying this cut-off (results not shown).

district in 1985, which also doubled from 3.3 to 6.7 percent (see the first row in Table 1). Manufacturing employment gains were large for both females and males. There was also a major increase in per capita expenditures, education and urbanization during this period (Table 1).

The map in Figure 1 divides districts into three quantiles based on the extent of change in industrialization (measured by manufacturing employment) during the period 1985 to 1995. The increase in manufacturing was fairly evenly spread around the archipelago, with high concentrations on Java, but also in the province of Riau on Sumatra, in West Kalimantan on the island of Kalimantan, and in parts of the outer islands. The correlation of the change in industrialization between a district and other districts in the same province was only 0.29, again suggesting a relatively even spread.

On a national basis, nearly all measures of social capital were increasing during this period (social capital summary statistics are presented in Tables 4 to 9). The density of non-governmental credit cooperatives increased sharply from 0.092 to 0.168 per 1000 population from 1986 to 1996; traditional arts groups showed a large increase over the period, from 17 percent of communities having such a group up to 26 percent; the density of mosques per capita also increased by over thirty percent; the share of household expenditures on festivals and ceremonies increased by nearly 1.5 percentage points; and the proportion of the elderly individuals cohabiting with adult children was stable, while the proportion of women aged 30-39 years whose first marriage had ended (in most cases through divorce, as we discuss below) fell by over one-third.

5.2 Reverse Causality

The possibility of reverse causality – namely, that changes in social capital led to more industrialization, rather than the other way around – is a central identification concern. Unfortunately, convincing instrumental variables for district-level industrial development and social capital have been impossible to find.[24] However, we present evidence that initial social capital measures in 1985 do not, in fact, predict

[24] For example, by this period government investment policy no longer favored specific regions (Hill 1996).

increases in industrial employment over the following decade (Tables 2 and 3).

Initial local manufacturing employment in 1985 had powerful effects in predicting manufacturing growth from 1985 to 1995 (regression 1), and we supplement this basic specification with the initial values of other potential determinants of manufacturing growth (regression 2): average road quality in the district (coded from 1 = dirt to 3 = paved), urbanization, and the proportion of the district population living in communities with access to electricity. We also control for the change in access to schooling, specifically, the change from 1973 to 1984 in primary and junior high schools per school age population. We find, perhaps surprisingly, that road quality and access to electricity have statistically insignificant effects. Also surprisingly, educational expansion does not predict subsequent manufacturing growth. Thus, as we mentioned in Section 4, several time-varying characteristics that could potentially affect both social capital and industrialization are not in fact associated with industrialization. Initial urbanization is unexpectedly negatively associated with subsequent industrial development, perhaps due to negative congestion effects. Geographic factors – island indicator variables, whether the district is coastal, and altitude – also only weakly predict the arrival of new factories. At the same time, because changing social norms and attitudes may be correlated with broad geographical characteristics, we include some of these measures as controls in the analysis that follows.

The most important result in this sub-section is that initial social capital does not predict manufacturing employment growth. First, community credit cooperative density does not predict growth in manufacturing employment, neither when initial industrialization measures are included as explanatory variables (Table 2, regression 3) nor when they are excluded (regression 4). In fact, we find that coefficient estimates are statistically insignificant for ten of our twelve measures of initial social capital (Table 3). The only exceptions are the coefficient estimates on mosques per capita (which is positive and statistically significant at 90 percent confidence) and traditional arts groups (which are negative and significant at 99 percent confidence). Overall, seven of the twelve point estimates on initial social capital are negative and five are positive, again indicating that there is no clear pattern between initial social capital and subsequent industrialization. Results are similar when the initial manufacturing employment

measures are not included as explanatory variables, and when growth in per capita expenditures is the dependent variable, rather than manufacturing employment (results not shown).

These results suggest that we are unlikely to suffer from reverse causality; that is, if the initial level of social capital does not predict industrial development, it is plausible that increases in social capital are not driving industrialization either.

5.3 Theoretical Channels

Manufacturing growth is strongly associated with growth in per capita consumption: a 10 percentage point increase in manufacturing employment – approximately two standard deviations – increases per capita consumption by roughly 14 percent (Table 4, regression 1). Local industrialization also led to greater inequality of per capita consumption within districts, but the effect is modest: a 10 percentage point gain in manufacturing employment increases the 90/10 ratio by only 0.5, which is less than one-third of a standard deviation of the change in the ratio during this period. Both results are consistent with the theoretical model presented in Section 3.

Industrialization in other districts within 200 kilometers is associated with higher out-migration in the past five years (regression 3), and the coefficient estimate is significantly different from zero at 90 percent confidence. Unfortunately, in our data, individuals who leave home (to take a manufacturing job, for example) for up to six months may still be counted as household members in their original district. Thus our measure misses temporary "circular migration." Circular migrants were quite common during our study period, particularly in rural Java (Breman 2001). Migration to distant parts of the archipelago was the exception rather than the rule during this period: over fifty percent of all out-migrants moved to other districts in the same province as their birth district, while only seven percent of out-migrants were "trans-migrants" (settlers in a government program targeting remote non-industrial areas). The in-migration results largely parallel those for out-migration (Regression 4). That is, industrialization in the local district predicts higher in-migration, while industrialization in nearby districts (within 200

kilometers) predicts less in-migration.

Micro-data from the SUPAS survey provides further information on the characteristics of migrants. The migration rate of young adults 16 to 29 years old is the highest of all age groups (Table 5, regression 1), and the migration of this age group is also most sensitive to both local and nearby industrialization (regression 2). This finding is parallel to migration patterns in other historical episodes including the Great Migration of African-Americans to the Northern United States in the early 20th century (Carrington et al. 1996). We also find that females and those with more education were particularly likely to migrate in Indonesia.

Cross-sectional evidence from the 1997 IFLS survey indicates that the same types of individuals who were likely to migrate during this period were also most likely to be members of community groups (regression 3). These individuals correspond to the "high types" in the theoretical model. Individuals with more education, young and middle-aged adults (16 to 49 years old), and females were most likely to be members of community groups. This age pattern of social capital investment is consistent with the life-cycle social capital investment hypothesis advanced in Glaeser, Laibson, and Sacerdote (2000) and Putnam (2000). We also examine the interaction of these characteristics with industrialization and find that "high types" are somewhat less likely to join community groups when there is greater industrialization in other districts within 200 kilometers, as predicted by the theoretical model, although the effects are not significantly different from zero at traditional confidence levels (results not shown).

5.4 Industrialization and Community Groups

The effects of industrialization on community group outcomes are presented in Tables 6 and 7. These regressions use the community as the unit of observation, with approximately 60,000 observations for each year (1986 and 1996), and they also include community geographic controls to increase statistical precision. Industrialization is measured at the district-level, and disturbance terms are clustered at the province-year level to capture correlated shocks across nearby districts.

Credit Cooperatives

Industrialization within a district is associated with a significant increase in the density of credit cooperatives: a ten percentage point increase in the proportion of adults working in manufacturing is associated with an increase of 0.014 credit cooperatives per 1,000 people and this effect is significantly different from zero at over 90 percent confidence (Table 6, regression 1). However, manufacturing growth in nearby areas – either other districts located within 200 kilometers or other districts in the same province (regression 2) – is associated with a substantial decline in the density of credit cooperatives: a two standard deviation increase, or four percentage points, in the proportion of manufacturing workers in other districts within 200 kilometers is associated with a decrease of nearly 0.06 in the number of non-governmental credit groups per 1,000 people. This decline cannot simply be an income effect since, as we showed in Table 4, there is no significant relationship between nearby industrialization and consumption growth in Indonesia.

The results are qualitatively similar in the cross-sectional regression without district fixed-effects (regression 3), although in this case the coefficient estimates are smaller and not statistically significant. The difference between local and nearby industrialization – the specification that most closely matches the theoretical model – enters in positively and significantly different from zero at 99 percent confidence, as expected (regression 4). The results are robust to the inclusion of initial 1985 industrialization as an additional explanatory variable (results not shown). There is no clear pattern in the effects of female versus male manufacturing employment on the expansion of credit cooperatives and other community groups (results not shown).[25, 26]

[25] The coefficient estimate on the interaction term between local and nearby industrialization is negative and statistically significant at 99 percent confidence, suggesting that the impact of being located near industrializing districts is compounded in rapidly industrializing areas, though the theoretical mechanisms underlying this result are not clear (results not shown).

[26] We also experimented with industrialization measures from the SI survey (described in the Data Appendix) as instrumental variables for the SUPAS manufacturing employment figures in order to address possible attenuation bias due to measurement error in the SUPAS measure, and this yields very similar results (results not shown).

The effect of industrialization on the density of all credit cooperatives – both quasi-governmental (KUD) and non-governmental – is similar, with large negative effects of nearby industrialization on credit cooperative growth, although the positive effect of local industrialization becomes insignificant (regression 5).

One potential concern regarding the interpretation of these results is that industrialization could facilitate the use of formal financial institutions and erode informal credit even if net credit availability is unchanged. For example, the establishment of formal financial institutions, including microfinance, may affect cooperatives. The most important national microfinance institution in Indonesia is the extensive BRI (*Bank Rakyat Indonesia*) network. If microfinance institutions disproportionately opened branches in poor districts located near industrializing areas, leading to a "crowding out" of credit cooperatives in these areas, this effect could potentially generate a spurious negative relationship between nearby industrialization and credit cooperatives. However, in the 1997 IFLS data we find that the presence of a BRI branch is not significantly correlated with the number of local factories, indicating that this hypothesized micro-finance bias is unlikely to be important. Moreover, the effect of nearby industrialization on the total density of formal financial institutions was near zero and statistically insignificant during this period, indicating that the drop in cooperatives was not part of an overall decline in financial institutions in these areas, due to falling demand for credit, for example (results not shown).

A hypothesis that could potentially generate a spurious relationship between local industrialization and the density of credit cooperatives is that cooperatives replace informal *arisan* (the traditional ROSCAs common throughout Indonesia) at higher levels of income. However, the 1997 IFLS data indicate that Indonesian households with higher consumption per capita actually spend a larger fraction of their income on *arisan*, rather than less, which suggests that individuals in rapidly industrializing areas may have access to more credit through both informal and formal sources.

Other Community Groups

Table 7 presents results following the specifications in Table 6 for a wide array of other community

groups. Overall, the results are similar to the cooperative results: local industrialization is typically associated with higher community group density, while industrialization in nearby districts is associated with lower community group densities, or no change.[27]

Local industrial change led to a significant increase in the existence of traditional arts groups, and nearby industrialization had a negative and nearly statistically significant (t-statistic=1.6) effect (Table 7, row 2). A ten percentage point increase in local manufacturing employment is associated with a nearly three percentage point increase in the probability that a community had an arts group.

We also examine how industrialization affected community recreational groups more broadly, by considering the total number of types of arts and sports groups in a community. Once again, local industrialization is associated with a sharp increase in the number of types of groups in a community, although the effect of nearby industrialization is close to zero (row 3). However, neither local nor nearby industrialization is associated with the existence of scouts youth groups (row 4).

Another major category of community groups is religious groups. Both for Muslim (row 5) and non-Muslim (row 6) places of worship, the coefficient estimate on local industrialization is positive and on nearby industrialization is negative, which is once again consistent with the predictions of the theoretical model, although effects are only significant for non-Muslim places of worship.

The one clear exception to the pattern predicted by theory is for farmers' irrigation groups (P3A). Rapidly industrializing districts had significantly fewer farmers' groups, and the point estimate on nearby industrialization is also negative and marginally significant. However, one should not expect such groups to expand in industrializing areas in any case, since irrigation is most important in predominantly agricultural settings; this relationship presumably tells us more about changes in the sectoral mix than about changes in social capital or community cohesion.[28]

[27] A supplementary appendix with robustness checks for the social capital outcomes is available upon request.
[28] When district-level industrialization channels – in-migration, out-migration, consumption, and inequality – are included as additional explanatory variables, their coefficient estimates are consistent with the theoretical model. Among the seven types of community groups we examine (excluding farmers' irrigation groups), five of seven coefficient estimates on in-migration are positive, five of seven coefficient estimates on out-migration are negative, five of seven coefficient estimates on consumptions are positive, and six of seven coefficient estimates on inequality

5.5 Informal social capital measures

We examine two informal measures of social capital. The first informal measure is the proportion of household spending on "ceremonies and festivals," which we measure using household level SUSENAS consumption data in 1987 and 1995. We find that local industrialization led to significantly higher spending on ceremonies and festivals as a proportion of total spending (at 99 percent confidence), and the results are robust to household-level controls for respondent education, gender, and age, and household size (Table 8, regression 1).[29] Nearby industrialization is associated with less spending on ceremonies and festivals, although the effect is not statistically significant.

The second measure of informal social capital is the opinion of village elders regarding the presence of an "ethic of mutual cooperation" both traditionally and in current practice. It is likely that "traditional practices" were set in the early 1900s before there was any meaningful modern industrial activity in Indonesia. Thus, the *level* of 1995 manufacturing is roughly the first-difference in manufacturing employment since the early 1900s, while the change in the ethic of mutual cooperation from the respondents' "traditional" period to 1997 is the first-difference in social capital. We find that local industrialization is not significantly associated with changes in the "ethic of mutual cooperation," but industrialization in nearby areas is associated with a decline in mutual cooperation at 95 percent confidence: a four percentage point increase (roughly two standard deviations) in the proportion of manufacturing workers in nearby districts is associated with a two percentage point decline in the probability that a community is characterized by "mutual cooperation" (regression 2), and the result is robust to the alternative measure of nearby industrialization (regression 3).

---

are positive (results available upon request). While most coefficient estimates on consumption were statistically significant, few coefficient estimates on migration are significant at traditional confidence levels. Possible explanations for the insignificant migration results include attenuation bias due to our noisy migration measures, which entirely miss the important phenomenon of circular migration, as discussed above; mis-specification as a result of complicated interaction effects among industrialization and the various proposed channels; and multicollinearity. For all of these reasons, we focus on reduced-form specifications.

[29] Missing values in the 1987 SUSENAS dataset reduce the sample to 201 of 274 districts, although the remaining districts include all of Java and Sumatra and 86 percent of the total national population.

5.6 Family Outcomes

Elderly Co-Residence

The elderly were more likely to reside with adult children in districts that industrialized: a ten percentage point increase in the share of adults employed in manufacturing is associated with a 1.3 percentage point higher elderly co-residence rate, and this relationship is statistically significant at 99 percent confidence and robust to individual level controls (Table 9, regression 1), while nearby industrialization has a statistically insignificant effect on elderly co-residence. An econometric specification that also includes individual characteristics interacted with the industrialization variables as explanatory variables indicates that the industrialization effect was concentrated among the married and for those elderly closer to sixty years of age (results not shown).

The increase in elderly co-residence with children in industrializing areas is not unprecedented in Southeast Asia. Although elderly co-residence rates fell dramatically in the United States, Europe and East Asia during industrialization, the downward trends in Southeast Asia – Malaysia, Philippines, Singapore, and Thailand – have been much less pronounced (Cameron and Cobb-Clark 2001, DaVanzo and Chan 1994, Hermalin 2000). In fact, a majority of the elderly co-resides with their children in all these Southeast Asian countries, and Hermalin (2000) believes that "it is unlikely that there will be a radical abandonment of existing social arrangements for the support of the elderly … in the near term." Research on neighboring Malaysia (DaVanzo and Chan 1994) – the most logical comparison country – indicates that elderly co-residence increases with local housing prices, presumably because of increasing returns to household size, and this may be driving part of the effect. The rhythm of the work day in the industrial sector in – with long work outside the home for factory workers – may also have led some elderly Indonesians to move in with their children, in order to care for grandchildren and provide other forms of domestic production, potentially forging closer family bonds in the process.

Divorce

We examine divorce outcomes for women using SUPAS household survey data. Unfortunately, we do not have a direct measure of the divorce rate, but instead measure the proportion of women in each district whose first marriage "ended", which may occur either through divorce (or separation) or husband death.[30] We examine how industrialization affected the probability that first marriages ended among women 30 to 39 years old, and argue that these ended marriages are overwhelmingly due to differential divorce rates across districts rather than to husband death. Using the 1993 and 1997 IFLS, which contain complete marriage histories, we find two patterns that support this claim. First, most marriages that end are in fact due to divorce or separation: the IFLS data indicates that nearly three-quarters of all "once married, but not currently married" women 20 to 39 years old are currently either divorced or separated, while only one-quarter are widows.[31] Second, the proportion of ended marriages due to husband death between 1993 and 1997 is nearly identical in both industrial and non-industrial areas. Specifically, the proportion due to husband death was 35.8 percent in communities with at least one factory and 34.9 percent in communities without a factory; thus, spouse mortality was if anything slightly *higher* in industrial areas, strengthening our results.

In the national SUPAS data, we find that local industrialization and industrialization in nearby districts are both associated with significantly lower rates of ended first marriages: an increase in local manufacturing employment of ten percentage points is associated with approximately 2 percentage points fewer ended first marriages (Table 9, regression 2).[32] The effects are robust to individual education and age controls, though including age at first marriage as an explanatory variable predictably reduces the

[30] Approximately 96 percent of women 30-39 years old in our sample had married at least once, and this proportion is stable between 1985 and 1995, thus, the issue of selection into "ever married" is not salient in our population.
[31] We examine a broader age range to increase the sample size for these calculations.
[32] We also investigated the relationship between industrialization and divorce rates using the IFLS data, which permitted us to estimate the more appropriate Cox proportional hazard model at the individual level to predict divorces between 1993 and 1997. Industrialized regions had lower divorce rates, but the effects were insignificantly different from zero at traditional confidence levels using the smaller IFLS sample (results not shown).

magnitude of the effects (regression 3), since high divorce rates have historically been associated with low ages of first marriage in Indonesia.

Districts with rapid growth in male manufacturing employment had particularly large declines in the proportion of ended marriages among women – in other words, *less* divorce – while districts with rapid female manufacturing employment growth had considerably *more* divorce (regression 4). This result suggests women were more empowered to exit marriages in areas where they held factory jobs, either due to greater financial security outside of marriage or to changing gender norms in these areas, echoing similar findings from the United States.[33]

6. Conclusion

6.1 Limitations of the Results

Despite the richness of the dataset that we have assembled, this paper is a study of one country, thus the question of relevance for other societies remains important. Indonesia is a rather special case because industrialization took place in a setting where government ideology promoted community groups and mutual assistance (*gotong royong* in Indonesian). Nonetheless, we feel that important aspects of the Indonesian experience generalize. For example, the large-scale migrations that accompanied Indonesian industrialization have been a common feature of industrial development from the U.S. Great Migration to contemporary China, and the community mutual assistance groups that we focus on are found in most less developed countries (Besley, Coate, and Loury 1993).

The limitations of Indonesian survey data are also major concerns in the study, because it is difficult to measure informal social connections and plausible that formal organizations arise in part to substitute for informal ties eroded by industrial transformation. Nonetheless, we find that several social capital measures which do not rely on formal community group registration – for example, the proportion of household expenditures on ceremonies and festivities, survey data on mutual cooperation, and elderly

[33] Using the U.S. Census Integrated Public Use Microdata Series for 1880-1990, Ruggles (1997: 404) finds that "the more working women and fewer working men in a district, the higher the likelihood of being divorced or separated."

co-residence rates – show patterns broadly similar to the community group data, indicating the main results are robust.

6.2 Implications for Social Capital and Development

The empirical results provide new insights into current debates on the role of social capital in economic development. Most importantly, our finding that initial social capital did *not* predict subsequent industrial development in Indonesia, and that local industrialization led to more social capital, challenge well-known empirical studies which find positive cross-sectional correlations between income levels and social capital, and use these correlations to claim that social capital promotes economic development. While social capital may (or may not) be essential for achieving collective action, good governance, and improving human welfare more broadly, as some authors have argued, we find no evidence from Indonesia that it promoted industrial development.[34] This point relates to the critique in Sobel (2002) that existing work in this area often confuses the causes and effects of social capital.

The results of this paper thus provide a new perspective on Putnam's (1993) seminal research on social capital in Northern versus Southern Italy. Putnam's stylized facts are that Northern Italy has a dense network of community groups and a prosperous industrial economy, while Southern Italy has relatively few groups and is poor. To sort out causality, Putnam employs historical evidence to argue that social capital has in fact been the driver of economic and political development over the past centuries. However, as Putnam himself acknowledges, large-scale out-migration from Southern Italy to Northern Italy in the 20th century – in response to differential rates of industrial development – may also have contributed to lower levels of social capital in Southern Italy, as in our theoretical model.

Our results also appear inconsistent with the claim in Putnam (1993) that local social capital is historically determined and persistent through time. In fact, rapid industrialization led to dramatic

[34] In a related point, Gertler, Levine, and Moretti (2001) also find that Indonesian individuals and communities with more social capital do not have better informal insurance against adverse health shocks (as measured by consumption smoothing).

changes in social capital measures within a single decade in Indonesia, and many districts with high initial community group densities did not remain leaders. To illustrate, the Spearman rank correlation between 1986 and 1996 in the district density of non-governmental credit cooperatives was 0.58, and for the density of traditional arts groups only 0.49.

The finding that industrialization in nearby districts led to reductions in social capital also lends credibility to claims that industrialization can sometimes be socially destructive, and it is possible that these side effects of industrialization in rural communities may have paved the way for recent social unrest in Indonesia. Breman (2001: 265) argues that "the erosion of the cohesive forces that formerly held village inhabitants together" contributed to crime, violence, and riots among laid-off workers returning to their home villages in rural Java during and after the 1998 Asian Financial Crisis. If rapid industrial development and attendant migrations have contributed to social instability in Indonesia, this could prove worrisome for other newly industrializing countries, like China, which is currently in the midst of history's largest economic migration.

We see this paper as a first step toward understanding the effects of economic transformation on social capital, and also plan to explore the impact of the 1998 Asian Financial Crisis on social capital, crime, and social stability across Indonesian districts in future research.

References

Akerlof, George. (1976). "The Economics of Caste and of the Rat Race and Other Woeful Tales," *Quarterly Journal of Economics*, 90(4), 599-617.

Alesina, Alberto, Reza Baqir, and William Easterly. (1999). "Public goods and ethnic divisions", *Quarterly Journal of Economics*, 114(4), 1243-1284.

Alesina, Alberto, and Eliana LaFerrara. (2000). "Participation in Heterogeneous Communities", *Quarterly Journal of Economics*, 115(3), 847-904.

Banerjee, Abhijit, and Andrew Newman. (1998). "Information, the Dual Economy, and Development", *Review of Economic Studies*, 65(4), 631-653.

Besley, Timothy, Stephen Coate, and Glenn Loury. (1993). "The Economics of Rotating Savings and Credit Associations", *American Economic Review*, 83 (4), 792-810.

Besley, Timothy, and Robin Burgess. (2000). "Land Reform, Poverty Reduction, and Growth: Evidence from India", *Quarterly Journal of Economics*, 115(2), 389-430.

Breman, Jan. (2001). "The Impact of the Asian Economic Crisis on Work and Welfare in Village Java", *Journal of Agrarian Change*, 1(2), 242-282.

Cameron, Lisa, and Deborah A. Cobb-Clark. (2001). "Old-Age Support in Developing Countries: Labor Supply, Intergenerational Transfers and Living Arrangements", *IZA Discussion Paper #289.*

Carrington, William J., Enrica Detragiache, and Tara Vishwanath. (1996). "Migration with Endogenous Moving Costs," *American Economic Review*, 86(4), 909-930.

Ciscel, David, and Julia Heath. (2001). "To Market, to Market: Imperial Capitalism's Destruction of Social Capital and the Family," *Review of Radical Political Economics*, 33(4), 401-414.

Coleman, James. (1990). *Foundations of Social Theory*. Cambridge: Harvard University Press.

Conley, Timothy. (1999). "GMM estimation with cross sectional dependence," *Journal of Econometrics*, 92(1), 1-45.

Cooper, Russell, and Andrew John. (1988). "Coordinating Coordination Failures in Keynesian Models", *Quarterly Journal of Economics*, 103 (3), 441-463.

Costa, Dora, and Matthew E. Kahn. (2001). "Understanding the Decline in Social Capital, 1952-1998", *NBER Working Paper #8295.*

Cowgill, Donald O. (1974). "Aging and Modernization: A Revision of Theory." In Jaber F. Gubrium (ed.), *Late Life: Communities and Environmental Policy*. Springfield, Illinois: Charles C. Thomas.

Cribb, Robert, and Colin Brown. (1995). *Modern Indonesia: A History since 1945*. Longman Press, London.

Cutler, David, and Edward Glaeser. (1997). "Are Ghettos Good or Bad?" *Quarterly Journal of Economics*, 112(3), 827-872.

Danaher, Kevin. (2001). *10 Reasons to Abolish the IMF and World Bank.* Seven Stories Press: New York.

DaVanzo, Julie, and Angelique Chan. (1994). "Living Arrangements of Older Malaysians: Who Coresides with their Adult Children?", *Demography* 31(1), 95-113.

DiPasquale, Denise, and Edward L. Glaeser. (1999). "Incentives and Social Capital: Are Homeowners Better Citizens?", *Journal of Urban Economics*, 45(2), 354-384.

Duflo, Esther. (2001)."School and Labor Market Consequences of School Construction in Indonesia: Evidence from an Unusual Policy Experiment", *American Economic Review*, 91(4), 795-813..

Eldgridge, Philip J. (1995). *Non-Governmental Organizations and Democratic Participation in Indonesia*. Oxford University Press.

Frankenberg, Elizabeth, and Duncan Thomas. (2001). "Lost but Not Forgotten: Attrition and Follow-up in the Indonesia Family Life Survey," *Journal of Human Resources*, 36(3), 556-592.

Fudenberg, Drew and Eric Maskin (1996). "The Folk Theorem in Repeated Games with Discounting or with Incomplete Information", *Econometrica*, 54, 533-556.

Fukuyama, Francis. (2000). "Social Capital and Civil Society", *IMF Working Paper WP/00/74.*

Geertz, Clifford. (1963). *Agricultural Involution: The Process of Ecological Change in Indonesia*. Berkeley: University of California Press.

Gertler, Paul, David I. Levine, and Enrico Moretti. (2001). "Is Social Capital the Capital of the Poor?", unpublished manuscript, U.C. Berkeley.

Glaeser, Edward L., David I. Laibson, Jose A. Scheinkman, and Christin L. Soutter. (2000). "Measuring Trust", *Quarterly Journal of Economics*, 115(3), 811-846.

Glaeser, Edward, David Laibson, and Bruce Sacerdote. (2000). "The Economic Approach to Social Capital," *NBER Working Paper #7728.*

Greif, Avner. (1993). "Contract Enforceability and Economic Institutions in Early Trade: the Maghribi Traders' Coalition", *American Economic Review*, 83(3), 525-548.

Grootaert, Christiaan. (1999). "Social Capital, Household Welfare and Poverty in Indonesia", World Bank Working Paper, unpublished.

Gugerty, Mary Kay, and Michael Kremer. (2002). "Outside Funding of Community Organizations: Benefiting or Displacing the Poor?", *National Bureau of Economic Research Working Paper #7896.*

Heaton, Tim B., Mark Cammack, and Larry Young. (2001). "Why is the Divorce Rate Declining in Indonesia?", *Journal of Marriage and Family*, 63(2), 480-490.

Hechter, Michael. (1987). *Principles of Group Solidarity*. University of California Press.

Hermalin, Albert I. (2000). “Ageing in Asia: Facing the Crossroads,” University of Michigan Population Studies Center, Report 00-55.

Hill, Hal. (1996). “Indonesia’s Industrial Policy and Performance: ‘Orthodoxy’ Vindicated”, *Economic Development and Cultural Change*, 147-174.

Jones, Gavin W. (1994). *Marriage and Divorce in Islamic South-East Asia*, Oxford University Press: Kuala Lumpur.

Knack, Stephen, and Philip Keefer. (1997). “Does Social Capital Have an Economic Payoff? A Cross-country Investigation,” *Quarterly Journal of Economics*, 112(4), 1251-1288.

Kranton, Rachel. (1996). “Reciprocal Exchange: A Self-Sustaining System,” *American Economic Review*, 86(4), 830-851.

Ligon, E., J. P. Thomas and T. Worrall. (2001). “Informal Insurance Arrangements with Limited Commitment: Theory and Evidence from Village Economies”, *Review of Economic Studies*, 69(1), 209-44.

Lont, Hotze. (2000). "Finding the right balance: Financial self-help organizations as sources of security and insecurity in urban Indonesia", *International Review of Social History*, 45, 159-177.

Marx, Karl, and Friedrich Engels. (1964 [1848]). *The Communist Manifesto*. Washington Square Press, New York.

Miguel, Edward, and Mary Kay Gugerty. (2002). “Ethnic Diversity, Social Sanctions, and Public Goods in Kenya”, unpublished manuscript, U.C. Berkeley.

Narayan, Deepa, and Lant Pritchett. (1999). “Cents and Sociability: Household Income and Social Capital in Rural Tanzania”, *Economic Development and Cultural Change*, 47 (4), 871-897.

Platteau, Jean-Philippe. (2000). *Institutions, Social Norms, and Economic Development*. Harwood Academic Press.

Polanyi, Karl. (1957 [1944]). *The Great Transformation: The Political and Economic Origins of Our Time*. Beacon Press, Boston.

Putnam, Robert D. (1993). *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton: Princeton University Press.

Putnam Robert D. (1995). “Bowling Alone: America’s Declining Social Capital”, *Journal of Democracy*, 6(1), 65-78.

Putnam, Robert D. (2000). *Bowling Alone: The Collapse and Revival of American Community*. Simon and Schuster: New York.

Routledge, Bryan R., and Joachim von Amsberg. (2002). “Social Capital and Growth,” unpublished manuscript, Carnegie-Mellon University.

Ruggles, Steven. (1997). “The Rise of Divorce and Separation in the United States, 1880-1990”,

Demography, 34(4), 455-466.

Schelling, Thomas. (1978). *Micromotives and Macrobehavior*, W.W. Norton and Company.

Schiff, Maurice. (1998). "Trade, Migration, and Welfare: The Impact of Social Capital", *World Bank Working Paper Series #2044.*

Schiller, Anne. (1996). "An 'Old' Religion in 'New Order' Indonesia: Notes on Ethnicity and Religious Affiliation", *Sociology of Religion*, 57(4), 409-417.

Skocpol, Theda, Marshall Ganz, and Ziad Munson. (2000). "A nation of organizers: The institutional origins of civic voluntarism in the United States", *American Political Science Review*, 94(3), 527-546.

Sobel, Joel. (2002). "Can We Trust Social Capital?" *Journal of Economic Literature*, 40 (1), 139-154.

Surbakti, Pajung. (1995). *Indonesia's National Socio-economic Survey: A Continual Source for Analysis on Welfare Development*. Central Bureau of Statistics: Jakarta.

Udry, Christopher. (1994). "Risk and Insurance in a Rural Credit Market: An Empirical Investigation in Northern Nigeria," *Review of Economic Studies*, 61(3), 495-526.

Varshney, Ashutosh. (2002). *Ethnic Conflict and Civic Life: Hindus and Muslims in India*. Yale University Press: New Haven.

World Bank (2002). "Global Development Network Growth Database" (found on-line at www.worldbank.org/research).

Tables and Figures

Table 1: District Summary Statistics

Variable description (Data source)	1985-87 mean (s.d.)	1995-97 mean (s.d.)	1995-97 – 1985-87 mean (s.d.)
Proportion manufacturing workers among population aged 16-60 years, district average (1985, 1995 SUPAS)	0.033 (0.030)	0.067 (0.072)	0.034 (0.051)
Proportion manufacturing workers among population aged 16-60 years working at least 20 hours per week, district average (1985, 1995 SUPAS)	0.063 (0.059)	0.131 (0.145)	0.068 (0.037)
Proportion manufacturing workers among female population aged 16-60 years, district average (1985, 1995 SUPAS)	0.020 (0.024)	0.043 (0.055)	0.023 (0.039)
Proportion manufacturing workers among male population aged 16-60 years, district average (1985, 1995 SUPAS)	0.046 (0.040)	0.091 (0.094)	0.044 (0.068)
Proportion mfg. workers among population aged 16-60 years, other districts within 200 km (1985,1995 SUPAS)	0.034 (0.015)	0.064 (0.033)	0.030 (0.019)
Proportion manufacturing workers among population aged 16-60 years, other districts in province (1985,1995 SUPAS)	0.033 (0.016)	0.067 (0.033)	0.034 (0.020)
Monthly per capita expenditures (in 1985 rupiah), district average (1985 SUPAS, 1995 SUSENAS) †	11437 (2837)	24541 (8676)	13104 (7118)
90/10 ratio of per capita expenditures in district (1985 SUPAS, 1995 SUSENAS) †	4.73 (0.96)	5.20 (1.44)	0.47 (1.53)
Proportion of district residents who moved out of district in past five years (1985, 1995 SUPAS)	0.039 (0.026)	0.053 (0.030)	0.014 (0.020)
Proportion of current district residents who moved into the district in past five years (1985, 1995 SUPAS)	0.039 (0.041)	0.049 (0.037)	0.010 (0.025)
Primary and junior high schools, per 1973 school-age population (Ministry of Education)	0.0029 (0.0018) [1973/74]	0.0056 (0.0031) [1983/84]	0.0026 (0.0014)
Proportion of district population living in non-coastal areas (1986, 1996 PODES)	0.87 (0.17)	0.90 (0.16)	0.03 (0.05)
Proportion of district population living in high altitude areas, >500m (1986, 1996 PODES)	0.25 (0.26)	0.24 (0.24)	-0.01 (0.16)
Average village area in km^2 (1986, 1996 PODES)	13.21 (24.45)	12.99 (22.90)	-0.23 (22.22)
Average years of schooling attained amongst ages 18 to 49 (1985, 1995 SUPAS)	5.607 (1.578)	7.223 (1.537)	1.615 (0.543)
Proportion of district population living in urban areas (1985, 1995 SUPAS)	0.272 (0.304)	0.359 (0.310)	0.087 (0.121)
Proportion of district population living in villages with access to electricity (1986, 1996 PODES)	0.745 (0.186)	0.941 (0.096)	0.195 (0.152)

Notes: Summary statistics weighted by district population. Data sources are in parentheses.

† 1997 figures deflated with consumer price data from WB-GDN database. 1 USD=1110.6 rupiah (1985).

Table 2: Predicting Industrialization

	Dependent variable: Change (1985-1995) proportion manufacturing workers among population aged 16-60 years, district average			
	(1)	(2)	(3)	(4)
Non-governmental credit cooperatives per 1000 population, 1986			-0.047	-0.064
			(0.069)	(0.077)
Proportion mfg. workers among population aged 16-60 years, district average, 1985	0.94***	1.11**	1.09***	
	(0.20)	(0.41)	(0.38)	
Proportion mfg. workers among population aged 16-60 years, other districts in the province, 1985	-0.062	-0.167	-0.283	
	(0.322)	(0.469)	(0.415)	
Average road quality in district, 1=dirt, 2=gravel, 3=asphalt, 1986		-0.002	0.003	-0.019
		(0.007)	(0.007)	(0.013)
Change (1973/74-1983/84) primary and junior high schools per 1973 school-age population		4.3	4.2	5.5
		(3.9)	(3.6)	(4.3)
Average years of schooling among population aged 18-49 years, district average		0.001	0.002	0.002
		(0.006)	(0.006)	(0.007)
Proportion district population living in areas with access to electricity, 1986		0.017	0.019	0.073*
		(0.019)	(0.019)	(0.037)
Proportion district population living in urban area, 1986		-0.051*	-0.057*	-0.005
		(0.027)	(0.033)	(0.017)
Proportion of district population living in non-coastal areas, 1986		0.009	0.010	0.021
		(0.021)	(0.022)	(0.024)
Proportion of district population living in high altitude areas, >500m, 1986		-0.017	-0.017	-0.004
		(0.014)	(0.014)	(0.006)
Kalimantan indicator		-0.013	-0.010	-0.017
		(0.024)	(0.020)	(0.018)
Java-Bali indicator		0.001	0.006	0.022***
		(0.023)	(0.020)	(0.006)
Sulawesi indicator		-0.017***	-0.016***	-0.023***
		(0.006)	(0.006)	(0.008)
Sumatra island indicator		-0.013	-0.011	-0.019*
		(0.010)	(0.009)	(0.011)
R^2	0.28	0.34	0.34	0.15
Root MSE	0.044	0.043	0.043	0.048
Number of observations	274	274	274	274
Mean of dependent variable	0.034	0.034	0.034	0.034

Notes: OLS regression results. Robust standard errors in parentheses. Disturbance terms are clustered by province; significance levels are unchanged using the method in Conley (1999). Significantly different than zero at 99 (***), 95 (**), and 90 (*) percent confidence. The omitted group is Maluku and Nusa Tenggara.

Table 3: Predicting Industrialization

Initial social capital measure (explanatory variable)	Coefficient estimate on initial social capital measure	Number of observations (districts)
1) Number of non-governmental credit cooperatives per 1000 people, 1986	-0.047 (0.069)	274
2) Total number of credit cooperatives (governmental and non-governmental) per 1000 people, 1986	-0.056 (0.060)	274
3) Existence traditional arts group in community, 1986	-0.056*** (0.019)	274
4) Number of distinct types of arts and sports groups in community, 1986	-0.0010 (0.0024)	274
5) Existence of scout youth group in community, 1986	0.004 (0.015)	274
6) Mosques per 1000 people, 1986	0.0076* (0.0042)	274
7) Existence of a non-Muslim place of worship in community, 1986	-0.25 (2.28)	274
8) Existence farmers' irrigation group (P3A) in community, 1986	0.003 (0.012)	274
9) Share of Household Expenditure Spent on Ceremonies and Festivals, 1985	-0.24 (1.11)	201
10) Community "ethic of mutual cooperation" in traditional times (*adat*)	-0.13 (0.12)	142
11) Indicator for if a person aged at least 60 years resides with a child aged at least 18 years, 1985	0.008 (0.024)	274
12) Indicator for if a woman's first marriage ended, among women aged 30-39 years old, 1985	0.034 (0.051)	274

Notes: OLS regression results. The dependent variable is the change (1985-1995) in the proportion of manufacturing workers among population aged 16-60 years, district average. Robust standard errors in parentheses. Disturbance terms are clustered by province; significance levels are unchanged using the method in Conley (1999). Significantly different than zero at 99 (***), 95 (**), and 90 (*) percent confidence. The specification is analogous to Table 2, regression 3. Village level data is from PODES 1986, 1993, and 1996. District level industrialization data is from SUPAS 1985, 1995.

Table 4: Industrial Development, Migration, Consumption, and Inequality

	Consumption: Change log monthly per capita expenditures (1985 rupiah), district average (1) Conley s.e.	Inequality: Change 90/10 ratio in per capita expenditures, district average (2) Conley s.e.	Out-migration: Change proportion who moved out of district in past five years (3) Conley s.e.	In-migration: Change proportion current residents who moved into district in past five years (4) Conley s.e.
Change proportion mfg. workers among population aged 16-60 years, district average	1.44*** (0.29)	5.02*** (1.36)	-0.00 (0.02)	0.11*** (0.04)
Change proportion mfg. workers among population aged 16-60 years, avg. for other districts located within 200 km	1.01 (1.53)	1.19 (7.07)	0.20* (0.11)	-0.50*** (0.10)
Average road quality in district, 1=dirt, 2=gravel, 3=asphalt, 1986	0.24*** (0.05)	1.34*** (0.32)	0.016** (0.007)	-0.011 (0.007)
Change (1973/74-1983/84) primary and junior high schools per 1973 school-age population	-12.2 (17.2)	210.1** (87.3)	-0.4 (1.5)	-4.6* (2.4)
Island indicator variables	Yes	Yes	Yes	Yes
Land-locked, altitude controls	Yes	Yes	Yes	Yes
R^2	0.38	0.21	0.14	0.17
Root MSE	0.17	1.39	0.02	0.02
Number of observations	274	274	274	274
Mean of dependent variable	0.76	0.47	0.01	0.01

Notes: Industrialization and migration data is from SUPAS 1985, 1995. Expenditure and inequality data is from SUPAS 1985 and SUSENAS 1995. Changes are over the period 1985 to 1995. Road, land-locked and altitude controls are from PODES 1986, 1996. Schools data is from Duflo (2001). All specifications are OLS regressions corrected for spatial dependence using Conley standard errors. Significantly different than zero at 99 (***), 95 (**), and 90 percent (*) confidence.

Table 5: Migration, Group Memberships, and Household Characteristics

	Indicator for individual moved to another district in past five years		Number of community group memberships by household in 1997
	(1)	(2)	(3)
District industrialization variables			
Proportion mfg. workers among population aged 16-60 years	-0.031*	-0.137***	
	(0.019)	(0.023)	
Proportion mfg. workers among population aged 16-60 yrs, other districts within 200 km	0.082	0.199*	
	(0.083)	(0.108)	
Individual, household characteristics			
Years of education	0.0055***	0.0056***	0.0439***
	(0.0003)	(0.003)	(0.0045)
Female	0.0029***	0.0028***	0.341***
	(0.0011)	(0.0010)	(0.082)
Married	0.0010	0.0005	
	(0.0035)	(0.0033)	
Age 5-15 years	-0.035***	-0.035***	-0.493***
	(0.004)	(0.004)	(0.085)
Age 30-39 years	-0.031***	-0.031***	0.254***
	(0.003)	(0.003)	(0.098)
Age 40-49 years	-0.049***	-0.049***	0.139
	(0.004)	(0.004)	(0.118)
Age 50-59 years	-0.0049***	-0.0049***	-0.074
	(0.004)	(0.004)	(0.126)
Age 60+ years	-0.0046***	-0.0046***	-0.285**
	(0.004)	(0.004)	(0.131)
Interactions between individual characteristics and industrialization	No	Yes	No
Additional household characteristics	No	No	Yes
Other covariates			
Year is 1995	0.0047***	0.0056**	
	(0.0017)	(0.0027)	
Observations (individuals)	1,312,296	1,312,296	-
Observations (households)	-	-	5335
R-squared	0.04	0.04	0.12
Mean (s.d.) of dependent variable:			
1985	0.040	0.040	-
	(0.195)	(0.195)	
1995/1997	0.052	0.052	0.887
	(0.222)	(0.222)	(1.162)

Notes: Migration data is from SUPAS 1985, 1995. District level industrialization data is from SUPAS 1985, 1995. Data on group memberships is from IFLS 1997. The household characteristics in Regression 3 are household proportions (of females, and individuals in certain age ranges), except for years of education, which is for the household head. The additional controls in Regression 3 are an indicator for a female-headed household, years of education of the spouse, controls for age of the household head and spouse, and the number of household members. All specifications are OLS regressions with district fixed effects. Standard errors robust to heteroscedasticity and clustering of disturbance terms at the (province*year) level are given in parentheses. Significantly different than zero at 99 (***), 95 (**), and 90 percent (*) confidence.

Table 6: Industrialization and Credit Cooperatives

	Number of non-governmental credit cooperatives per 1000 people				Total number of credit cooperatives (governmental and non-governmental) per 1000 people
	(1)	(2)	(3) No district FE	(4)	(5)
Proportion mfg. workers among population aged 16-60 years	0.142*	0.211***	0.024		0.085
	(0.080)	(0.081)	(0.084)		(0.076)
Proportion mfg. workers among population aged 16-60 yrs, other districts within 200 km	-1.295***		-0.581		-2.042***
	(0.225)		(0.360)		(0.264)
Proportion mfg. workers among population aged 16-60 yrs, rest of province		-1.493***			
		(0.214)			
(Proportion mfg. workers) – (Proportion mfg. workers other districts within 200 km)				0.225***	
				(0.087)	
Village geographic controls					
Village is non-coastal	0.018***	0.018***	0.035***	0.018***	0.014***
	(0.005)	(0.005)	(0.009)	(0.005)	(0.005)
Village altitude above 500m	-0.033***	-0.033***	-0.018*	-0.033***	-0.041***
	(0.007)	(0.007)	(0.009)	(0.007)	(0.007)
Village area, ha.	-0.95**	-0.92**	-1.65***	-0.96**	-1.27**
	(0.042)	(0.41)	(0.57)	(0.41)	(0.51)
Other covariates					
Year is 1996	0.108***	0.117***	0.091***	0.074***	0.146***
	(0.005)	(0.010)	(0.020)	(0.008)	(0.011)
Observations (communities)	128,778	128,778	128,778	128,778	128,778
R-squared	0.08	0.08	0.02	0.08	0.08
Mean (s.d.) of dependent variable:					
1986	0.092	0.092	0.092	0.092	0.131
	(0.264)	(0.264)	(0.264)	(0.264)	(0.306)
1996	0.168	0.168	0.168	0.168	0.220
	(0.413)	(0.413)	(0.413)	(0.413)	(0.472)

Notes: Village level data is from PODES 1986, 1996. District level industrialization data is from SUPAS 1985, 1995. All specifications are OLS regressions with district fixed effects, except for regression 3, which does not have district fixed effects. Standard errors robust to heteroscedasticity and clustering of disturbance terms at the (province*year) level are given in parentheses. Significantly different than zero at 99 (***), 95 (**), and 90 percent (*) confidence.

Table 7: Industrialization and Community Groups

Dependent variable	Coefficient estimate on proportion mfg. workers among population aged 16-60 years	Coefficient estimate on proportion mfg. workers among population aged 16-60 yrs, other districts within 200 km	Number of observations (communities)	Mean (s.d.) dependent variable, 1986	Mean (s.d.) dependent variable, 1993/1996
1) Number of non-governmental credit cooperatives per 1000 people	0.142*	-1.295***	128,778	0.092	0.168
	(0.080)	(0.225)		(0.264)	(0.413)
2) Existence traditional arts group in community	0.270***	-0.540	127,503	0.173	0.264
	(0.077)	(0.333)		(0.143)	(0.194)
3) Number of distinct types of arts and sports groups in community	3.00***	0.47	127,503	0.413	0.419
	(0.53)	(2.46)		(1.906)	(2.165)
4) Existence of scout youth group in community	-0.028	0.111	128,778	0.793	0.842
	(0.066)	(0.408)		(0.405)	(0.374)
5) Mosques per 1000 people	0.13	-0.02	128,778	0.84	1.14
	(0.14)	(0.83)		(0.83)	(1.17)
6) Existence of a non-Muslim place of worship in community	0.21***	-0.75**	128,778	0.335	0.345
	(0.08)	(0.36)		(0.472)	(0.478)
7) Existence farmers' irrigation group (P3A) in community	-0.372***	-0.343	127,503	0.385	0.408
	(0.121)	(0.267)		(0.487)	(0.492)

Notes: Village level data is from PODES 1986, 1993, and 1996. District level industrialization data is from SUPAS 1985, 1995. All specifications are OLS regressions with district fixed effects, as well as the village geographic controls, year indicator variable, and constant term as in Regression 1 in Table 5. The farmers' irrigation group (P3A) regression also contains an indicator for whether the community is "rural", and this has the expected sign. The irrigation group arts group, and sports group results are for 1986 and 1993, while the other group data are from 1986 and 1996. Standard errors robust to heteroscedasticity and clustering of disturbance terms at the (province*year) level are given in parentheses. Significantly different than zero at 99 (***), 95 (**), and 90 percent (*) confidence.

Table 8: Industrialization and "informal" social capital measures

	Share of Household Expenditure Spent on Ceremonies and Festivals	Change in community "ethic of mutual cooperation" between tradition (*adat*) and current practice	
	(1)	(2)	(3)
Proportion mfg. workers among population aged 16-60 years	0.010***	-0.09	-0.06
	(0.003)	(0.16)	(0.15)
Proportion mfg. workers among population aged 16-60 yrs, other districts within 200 km	-0.045	-0.55**	
	(0.051)	(0.22)	
Proportion mfg. workers among population aged 16-60 yrs, rest of province			-0.67**
			(0.26)
Individual, household characteristics			
Household head years of education	-0.000002		
	(0.000043)		
Household head is female	-0.00026		
	(0.00022)		
Household head age in years	0.000046***		
	(0.000006)		
Household size	0.00019**		
	(0.00009)		
Other covariates			
Year is 1995	0.0156***		
	(0.0022)		
Observations (households)	182,731	-	
Observations (communities)	-	270	270
R-squared	0.11	0.02	0.02
Mean (s.d.) of dependent variable:			
1987	0.0025		
	(0.0076)		
1995	0.0170		
	(0.0327)		
Change (1997 – "Traditionally")		-0.022	-0.022
		(0.148)	(0.148)

Notes: Expenditure data are from SUSENAS 1987 and 1995. Due to incomplete SUSENAS 1987 data, 73 districts were omitted. These include all 29 districts in Kalimantan, all 37 districts in Sulawesi, all 5 districts in Maluku, as well as 2 districts in Nusa Tenggera. The data is unbalanced – only 37,789 household observations are from 1987. The ethic of mutual cooperation data is from the 1997 IFLS, which is available for 270 communities in 142 districts.

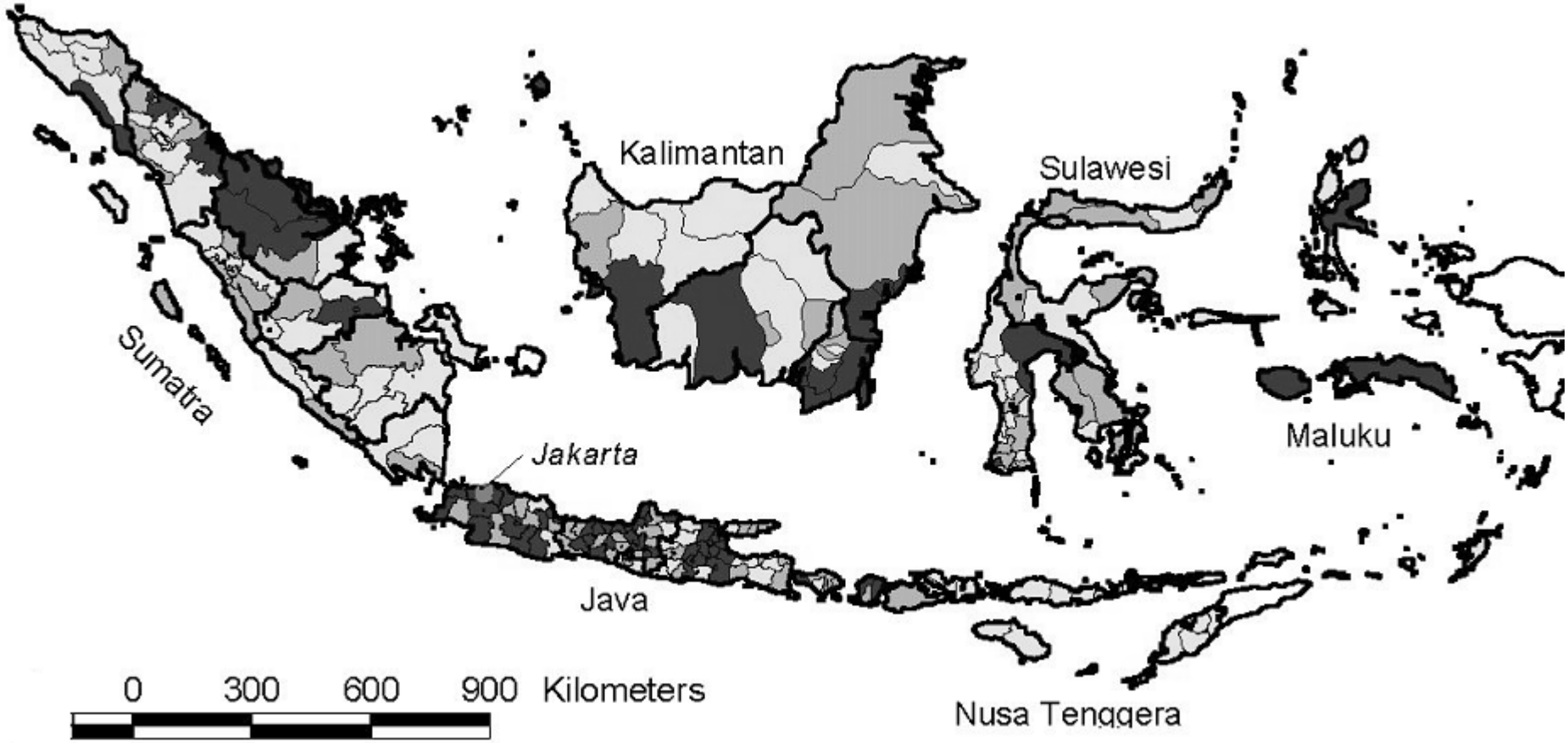
Regression 1 is an OLS regression with district fixed effects, and are weighted by sample weights. Standard errors robust to heteroscedasticity and clustering of disturbance terms at the (province*year) level are given in parentheses. Significantly different than zero at 99 (***), 95 (**), and 90 percent (*) confidence. Regression 2 includes a constant term, and standard errors robust to heteroscedasticity and clustering of disturbance terms at the province level are given in parentheses.

Table 9: Industrialization and Family Outcomes

	Indicator for if a person aged at least 60 years resides with a child aged at least 18 years	Indicator for if a woman's first marriage ended, among women aged 30-39 years old		
	(1)	(2)	(3)	(4)
Proportion mfg. workers among population aged 16-60 years	0.129***	-0.238***	-0.134**	
	(0.051)	(0.033)	(0.064)	
Proportion mfg. workers among population aged 16-60 yrs, other districts within 200 km	0.105	-1.417***	-1.421***	
	(0.230)	(0.186)	(0.179)	
Proportion mfg. workers among **FEMALES** aged 16-60 years				0.172***
				(0.057)
Proportion mfg. workers among **MALES** aged 16-60 years				-0.198***
				(0.062)
Proportion mfg. workers among **FEMALES** aged 16-60 yrs, other districts within 200 km				-0.567
				(0.670)
Proportion mfg. workers among **MALES** aged 16-60 yrs, other districts within 200 km				-0.767**
				(0.346)
Individual, household characteristics				
Years of education	0.012***		-0.013***	-0.013***
	(0.02)		(0.001)	(0.001)
Female	-0.019***			
	(0.007)			
Married	-0.126***			
	(0.012)			
Age in years	-0.0030***		0.0073***	0.0073***
	(0.0004)		(0.0009)	(0.0009)
Age * Female	0.0022***			
	(0.0006)			
Age at first marriage			-0.012***	-0.012***
			(0.002)	(0.002)
Other covariates				
Year is 1995	-0.012*	-0.043***	-0.025***	-0.026***
	(0.006)	(0.005)	(0.005)	(0.005)
Observations (individuals)	92,287	97,719	97,719	97,719
R-squared	0.06	0.06	0.10	0.10
Mean (s.d.) of dependent variable:				
1985	0.587	0.258	0.258	0.258
	(0.242)	(0.437)	(0.437)	(0.437)
1995	0.584	0.162	0.162	0.162
	(0.243)	(0.368)	(0.368)	(0.368)

Notes: Elderly co-residence and marriage data from SUPAS 1985, 1995. For regression 1, "Age in years" is included as "Age in years minus 60". Regressions are linear probability regressions with district fixed effects and year effects, and are weighted by sample weights. Means are calculated with sample weights. Standard errors robust to heteroscedasticity and clustering of disturbance terms at the (province*year) level are given in parentheses. Significantly different than zero at 99 (***), 95 (**), and 90 percent (*) confidence.

Figure 1: Industrial development in Indonesia, 1985-1995[35]



[35] Change in the proportion of manufacturing workers 1985 to 1995 among population aged 16-60 years, district averages, SUPAS. Light gray denotes the bottom third of districts in terms of industrialization, gray denotes the middle third of districts, and dark gray denotes the top third of districts. The white areas on the map – East Timor and Irian Jaya – are excluded from the analysis.

Data Appendix

A.1 Village Potential Statistics (PODES)

The Village Potential Statistics (PODES) survey provides detailed information about the characteristics of villages and urban neighborhoods. We analyze the 1986 and 1996 PODES surveys (though variables relating to arts and sports groups come from the 1993 survey). Over 60,000 village heads or neighborhood leaders filled out the survey about their area in each year in all districts, excluding East Timor and Irian Jaya. In addition to the community group measures, we also use PODES data on various geographic characteristics, including altitude, being land-locked, and community land area, as well as infrastructure characteristics, including road quality, access to electricity, in some cases.

A.2 National Socio-Economic Survey (SUSENAS)[36]

The National Socio-Economic Survey (SUSENAS) is an annually repeated cross-section. It surveyed between 20,000 and 50,000 households per year in the mid-1980s, and approximately 200,000 households per year by the mid-1990s. SUSENAS surveys the head of the household on the general welfare of each household member, in areas such as school enrollment, health, and mortality. We focus on the 1987 and 1995 SUSENAS surveys. We rely on the 1995 SUSENAS for average household expenditures and district-level measures of household expenditure inequality. The 1987 and 1995 surveys contain information on per capita household spending on "ceremonies and festivals", which we use as a measure of informal social capital. The SUSENAS sample was selected to be representative for each of Indonesia's districts. Smaller districts were over-sampled to improve the precision of district-level summary statistics.

Table A1: SUSENAS Summary Statistics (for Table 8)

Variable Description	1987 mean (s.d.)	1995 mean (s.d.)
Household head years of education	4.396	5.837
	(3.652)	(4.167)
Household age in years	44.15	45.00
	(13.88)	(14.21)
Household head is female	0.137	0.133
	(0.344)	(0.339)
Household size	4.564	4.211
	(2.114)	(1.912)
Observations	*37,789*	*144,942*

A.3 Intercensal Population Survey (SUPAS)[37]

The Intercensal Population Surveys (SUPAS) are carried out every ten years, in the mid period between complete population censuses. Households are interviewed to obtain information regarding issues such as education, fertility, mortality and migration. We analyze the 1985 and 1995 SUPAS. The 1985 SUPAS covered 126,696 households and 605,858 individuals, while the 1995 survey covered 216,946 households and 948,380 individuals. Sampling rules generally follow those of the SUSENAS. The specific variables we use from SUPAS include the proportion of elderly individuals (at least 60 years old) co-residing with adult children (at least 18 years old); residential mobility in the past five years;

[36] This section draws heavily on Surbakti (1995).

[37] Maya Federman kindly created several SUPAS variables for us.

average household expenditures (in 1985); district-level measures of household expenditure inequality (1985); and most importantly, the proportion of the adult population working in manufacturing occupations – our principal measure of district industrialization.

Table A2: SUPAS Summary Statistics

Variable Description	1985 mean (s.d.)	1995 mean (s.d.)
Panel A: Summary Statistics for Table 5		
Years of Education	4.391	5.795
	(3.583)	(4.015)
Age	27.28	29.06
	(17.76)	(17.95)
Female	0.504	0.504
	(0.500)	(0.500)
Married	0.449	0.482
	(0.497)	(0.500)
Observations	*513,197*	*799,099*
Panel B: Summary Statistics for Table 9		
Years of Education	1.618	2.280
	(2.650)	(3.134)
Age in years (minus 60)	7.55	7.73
	(7.74)	(7.03)
Female	0.523	0.537
	(0.499)	(0.499)
Married	0.537	0.607
	(0.499)	(0.489)
Observations	*33,590*	*58,697*

A.4 The Indonesia Family Life Survey (IFLS)

The IFLS is a representative sample of 83 percent of the population on Indonesia as of late 1993, covering 13 of Indonesia's 27 provinces (Frankenberg and Thomas 2001). The smallest provinces and politically unstable regions – such as Irian Jaya and the former East Timor – were not sampled. Within households different members were interviewed according to various selection criteria to ensure adequate numbers of older respondents.

We use both cross-sectional and retrospective information from the 1997 survey on over 7224 households distributed across several hundred communities. In each community the IFLS also interviewed an expert in local customs and laws (*adat*). We have *adat* information on 142 of the 274 districts we analyze, and these districts contain over two-thirds of Indonesia's 1985 population.

Table A3: IFLS Summary Statistics (for Table 5)

Variable Description	1997 mean (s.d.)
Household head years of education	5.61
	(4.35)
Proportion of household female	0.514
	(0.169)
Proportion of household age 5-15 years	0.256
	(0.207)
Proportion of household age 30-39 years	0.169
	(0.203)
Proportion of household age 40-49 years	0.124
	(0.175)
Proportion of household age 50-59 years	0.103
	(0.180)
Proportion of household age 60+ years	0.119
	(0.219)
Observations	*5335*

A.5 The Industrial Survey (SI) [38]

The Annual Manufacturing Survey (*Survei Tahunan Perusahaan Industri Pengolahan*, or SI), conducted by the Industrial Statistics Division of BPS, is designed to be the complete annual enumeration of all manufacturing establishments with twenty of more employees from 1975 onward. Although the SI and SUPAS have different definitions of manufacturing employment – the SI is an establishment survey, while SUPAS is a household survey – encouragingly, the SUPAS and SI manufacturing employment measures are correlated at 88percent across districts in 1985. For the SI, establishments must have at least twenty employees, while the SUPAS has no size restriction, thus the SUPAS definition is likely to be a better measure of industrialization since it captures small enterprises and informal-sector employment. We thus focus on the SUPAS industrialization data in the analysis, although the results are largely robust to using the SI data (results not shown).

A.6 School Construction[39]

We have district-level data from the Ministry of Education and Culture on the number of primary, middle, and high schools per school-aged child in both 1973/4 and 1983/4, the decade preceding our period of study, and use this data to predict subsequent industrialization. Indonesia pursued a massive school construction program in the 1970s (Duflo 2001).

[38] Garrick Blalock kindly created the SI variables for us.

[39] We are grateful to Esther Duflo for generously providing this data.

Supplementary Appendix (not intended for publication)

Table B6: Industrialization and Total Credit Cooperatives

	Total number of credit cooperatives (governmental and non-governmental) per 1000 people			
	(1)	(2)	(3)	(4) No district FE
Proportion mfg. workers among population aged 16-60 years	0.094	0.085	0.159**	0.112
	(0.073)	(0.076)	(0.078)	(0.079)
Proportion mfg. workers among population aged 16-60 yrs, other districts within 200 km	-2.016***	-2.042***		-1.425***
	(0.262)	(0.264)		(0.394)
Proportion mfg. workers among population aged 16-60 yrs, rest of province			-2.015***	
			(0.228)	
Village geographic controls				
Village is non-coastal		0.014***	0.014***	0.028**
		(0.005)	(0.005)	(0.011)
Village altitude above 500m		-0.041***	-0.041***	-0.021**
		(0.007)	(0.007)	(0.010)
Village area, ha.		-1.27**	-1.24**	-1.28***
		(0.051)	(0.49)	(0.43)
Other covariates				
Year is 1996	0.146***	0.146***	0.150***	0.134***
	(0.011)	(0.011)	(0.010)	(0.023)
Observations (communities)	128,778	128,778	128,778	128,778
R-squared	0.08	0.08	0.08	0.02
Mean (s.d.) of dependent variable:				
1986	0.092	0.092	0.092	0.092
	(0.264)	(0.264)	(0.264)	(0.264)
1996	0.168	0.168	0.168	0.168
	(0.413)	(0.413)	(0.413)	(0.413)

Notes: Village level data is from PODES 1986, 1996. District level industrialization data is from SUPAS 1985, 1995. All specifications are OLS regressions with district fixed effects, except for regression 4, which does not have district fixed effects. Standard errors robust to heteroscedasticity and clustering of disturbance terms at the (province*year) level are given in parentheses. Significantly different than zero at 99 (***), 95 (**), and 90 percent (*) confidence.

Table B7-1: Industrialization and Presence of Arts Groups

	Existence traditional arts group in community			
	(1)	(2)	(3)	(4) No district FE
Proportion mfg. workers among population aged 16-60 years	0.270***	0.270***	0.208***	0.363***
	(0.078)	(0.077)	(0.067)	(0.118)
Proportion mfg. workers among population aged 16-60 yrs, other districts within 200 km	-0.550	-0.540		-1.256***
	(0.337)	(0.333)		(0.367)
Proportion mfg. workers among population aged 16-60 yrs, rest of province			0.283	
			(0.336)	
Village geographic controls				
Village is non-coastal		-0.013	-0.012	-0.020
		(0.013)	(0.013)	(0.017)
Village altitude above 500m		0.007	0.008	0.004
		(0.007)	(0.007)	(0.014)
Village area, ha.		0.35	0.35	0.78*
		(0.30)	(0.30)	(0.45)
Other covariates				
Year is 1993	0.098***	0.098***	0.075***	0.116***
	(0.015)	(0.015)	(0.015)	(0.024)
Observations (communities)	127,503	127,503	127,503	127,503
R-squared	0.09	0.09	0.09	0.02
Mean (s.d.) of dependent variable:				
1986	0.172	0.172	0.172	0.172
	(0.378)	(0.378)	(0.378)	(0.378)
1993	0.264	0.264	0.264	0.264
	(0.441)	(0.441)	(0.441)	(0.441)

Notes: Village level data is from PODES 1986, 1993. District level industrialization data is from SUPAS 1985, 1995. All specifications are OLS regressions with district fixed effects, except for regression 4, which does not have district fixed effects. Standard errors robust to heteroscedasticity and clustering of disturbance terms at the (province*year) level are given in parentheses. Significantly different than zero at 99 (***), 95 (**), and 90 percent (*) confidence.

Table B7-2: Industrialization and Types of Sports and Arts Groups

	Number of distinct types of arts and sports groups in community (range 0 to 13)			
	(1)	(2)	(3)	(4) No district FE
Proportion mfg. workers among population aged 16-60 years	2.995**	3.003***	2.814***	5.530***
	(0.517)	(0.527)	(0.462)	(0.909)
Proportion mfg. workers among population aged 16-60 yrs, other districts within 200 km	1.007	0.471		7.340**
	(2.384)	(2.465)		(3.320)
Proportion mfg. workers among population aged 16-60 yrs, rest of province			2.175	
			(1.983)	
Village geographic controls				
Village is non-coastal		-0.111**	-0.110**	-0.088
		(0.044)	(0.045)	(0.069)
Village altitude above 500m		-0.264***	-0.264***	-0.203
		(0.043)	(0.042)	(0.148)
Village area, ha.		-0.49	-0.53	2.25
		(1.59)	(1.60)	(2.71)
Other covariates				
Year is 1993	-0.079	-0.057	-0.110	-0.347*
	(0.088)	(0.090)	(0.087)	(0.194)
Observations (communities)	127,503	127,503	127,503	127,503
R-squared	0.23	0.23	0.23	0.04
Mean (s.d.) of dependent variable:				
1986	4.134	4.134	4.134	4.134
	(1.906)	(1.906)	(1.906)	(1.906)
1993	4.186	4.186	4.186	4.186
	(2.165)	(2.165)	(2.165)	(2.165)

Notes: Village level data is from PODES 1986, 1993. District level industrialization data is from SUPAS 1985, 1995. All specifications are OLS regressions with district fixed effects, except for regression 4, which does not have district fixed effects. Standard errors robust to heteroscedasticity and clustering of disturbance terms at the (province*year) level are given in parentheses. Significantly different than zero at 99 (***), 95 (**), and 90 percent (*) confidence.

Table B7-3: Industrialization and Presence of Scout Groups

	Existence of scout youth group in community			
	(1)	(2)	(3)	(4) No district FE
Proportion mfg. workers among population aged 16-60 years	-0.022	-0.028	-0.043	0.391**
	(0.067)	(0.066)	(0.052)	(0.176)
Proportion mfg. workers among population aged 16-60 yrs, other districts within 200 km	0.142	0.111		5.058***
	(0.405)	(0.408)		(0.795)
Proportion mfg. workers among population aged 16-60 yrs, rest of province			0.219	
			(0.379)	
Village geographic controls				
Village is non-coastal		-0.016*	-0.016*	0.001
		(0.009)	(0.009)	(0.020)
Village altitude above 500m		-0.026***	-0.026***	-0.062***
		(0.008)	(0.008)	(0.015)
Village area, ha.		0.11	0.11	-1.35
		(0.39)	(0.39)	(1.08)
Other covariates				
Year is 1996	0.046***	0.047***	0.044**	-0.115**
	(0.018)	(0.018)	(0.018)	(0.054)
Observations (communities)	128,778	128,778	128,778	128,778
R-squared	0.37	0.37	0.37	0.14
Mean (s.d.) of dependent variable:				
1986	0.793	0.793	0.793	0.793
	(0.405)	(0.405)	(0.405)	(0.405)
1996	0.842	0.842	0.842	0.842
	(0.364)	(0.364)	(0.364)	(0.364)

Notes: Village level data is from PODES 1986, 1996. District level industrialization data is from SUPAS 1985, 1995. All specifications are OLS regressions with district fixed effects, except for regression 4, which does not have district fixed effects. Standard errors robust to heteroscedasticity and clustering of disturbance terms at the (province*year) level are given in parentheses. Significantly different than zero at 99 (***), 95 (**), and 90 percent (*) confidence.

Table B7-4: Industrialization and Mosques

	Mosques per 1000 people			
	(1)	(2)	(3)	(4) No district FE
Proportion mfg. workers among population aged 16-60 years	0.093	0.129	0.120	-1.675***
	(0.124)	(0.137)	(0.130)	(0.449)
Proportion mfg. workers among population aged 16-60 yrs, other districts within 200 km	-0.124	-0.020		3.735
	(0.848)	(0.825)		(2.551)
Proportion mfg. workers among population aged 16-60 yrs, rest of province			0.071	
			(0.680)	
Village geographic controls				
Village is non-coastal		-0.030	-0.030	-0.056
		(0.031)	(0.031)	(0.052)
Village altitude above 500m		0.137***	0.137***	0.351***
		(0.035)	(0.035)	(0.096)
Village area, ha.		0.98*	0.97*	3.69*
		(0.52)	(0.53)	(1.85)
Other covariates				
Year is 1996	0.298***	0.296***	0.294***	0.249**
	(0.033)	(0.033)	(0.033)	(0.118)
Observations (communities)	128,778	128,778	128,778	128,778
R-squared	0.33	0.33	0.33	0.05
Mean (s.d.) of dependent variable:				
1986	0.843	0.843	0.843	0.843
	(0.827)	(0.827)	(0.827)	(0.827)
1996	1.139	1.139	1.139	1.139
	(1.168)	(1.168)	(1.168)	(1.168)

Notes: Village level data is from PODES 1986, 1996. District level industrialization data is from SUPAS 1985, 1995. All specifications are OLS regressions with district fixed effects, except for regression 4, which does not have district fixed effects. Standard errors robust to heteroscedasticity and clustering of disturbance terms at the (province*year) level are given in parentheses. Significantly different than zero at 99 (***), 95 (**), and 90 percent (*) confidence.

Table B7-5: Industrialization and Non-Muslim Places of Worship

	Existence of a Non-Muslim place of worship (e.g. church, Buddhist temple) in community			
	(1)	(2)	(3)	(4) No district FE
Proportion mfg. workers among population aged 16-60 years	0.221***	0.212***	0.211***	0.771***
	(0.081)	(0.077)	(0.076)	(0.272)
Proportion mfg. workers among population aged 16-60 yrs, other districts within 200 km	-0.735**	-0.752**		-2.929**
	(0.373)	(0.362)		(1.447)
Proportion mfg. workers among population aged 16-60 yrs, rest of province			-0.472	
			(0.301)	
Village geographic controls				
Village is non-coastal		0.010	0.011	-0.061*
		(0.013)	(0.013)	(0.032)
Village altitude above 500m		-0.021*	-0.021*	-0.026
		(0.011)	(0.011)	(0.028)
Village area, ha.		1.90***	1.91***	1.67**
		(0.44)	(0.45)	(0.74)
Other covariates				
Year is 1996	0.024	0.024	0.018	0.072
	(0.016)	(0.015)	(0.014)	(0.079)
Observations (communities)	128,778	128,778	128,778	128,778
R-squared	0.38	0.38	0.38	0.03
Mean (s.d.) of dependent variable:				
1986	0.335	0.335	0.335	0.335
	(0.472)	(0.472)	(0.472)	(0.472)
1996	0.345	0.345	0.345	0.345
	(0.475)	(0.475)	(0.475)	(0.475)

Notes: Village level data is from PODES 1986, 1996. District level industrialization data is from SUPAS 1985, 1995. All specifications are OLS regressions with district fixed effects, except for regression 4, which does not have district fixed effects. Standard errors robust to heteroscedasticity and clustering of disturbance terms at the (province*year) level are given in parentheses. Significantly different than zero at 99 (***), 95 (**), and 90 percent (*) confidence.

Table B7-6: Industrialization and Farmers' Irrigation groups (P3A)

	Existence farmers' irrigation group (P3A) in community			
	(1)	(2)	(3)	(4) No district FE
Proportion mfg. workers among population aged 16-60 years	-0.432***	-0.372***	-0.394***	-0.257
	(0.138)	(0.121)	(0.118)	(0.274)
Proportion mfg. workers among population aged 16-60 yrs, other districts within 200 km	-0.220	-0.343		4.023***
	(0.248)	(0.267)		(0.902)
Proportion mfg. workers among population aged 16-60 yrs, rest of province			0.002	
			(0.207)	
Village geographic controls				
Village is non-coastal		0.082***	0.083***	0.129***
		(0.009)	(0.009)	(0.022)
Village altitude above 500m		-0.073***	-0.072***	-0.102***
		(0.019)	(0.019)	(0.024)
Village area, ha.		-0.82**	-0.81**	-3.45***
		(0.34)	(0.33)	(0.89)
Village is in rural region		0.059***	0.059***	0.259***
		(0.018)	(0.018)	(0.045)
Other covariates				
Year is 1993	0.045***	0.052***	0.043***	-0.067
	(0.010)	(0.011)	(0.012)	(0.061)
Observations (communities)	127,503	127,503	127,503	127,503
R-squared	0.38	0.38	0.38	0.11
Mean (s.d.) of dependent variable:				
1986	0.385	0.385	0.385	0.385
	(0.487)	(0.487)	(0.487)	(0.487)
1993	0.408	0.408	0.408	0.408
	(0.492)	(0.492)	(0.492)	(0.492)

Notes: Village level data is from PODES 1986, 1993. District level industrialization data is from SUPAS 1985, 1995. All specifications are OLS regressions with district fixed effects, except for regression 4, which does not have district fixed effects. Standard errors robust to heteroscedasticity and clustering of disturbance terms at the (province*year) level are given in parentheses. Significantly different than zero at 99 (***), 95 (**), and 90 percent (*) confidence.

Table B8: Industrialization and Festival Expenditures

	Share of Household Expenditure Spent on Ceremonies and Festivals			
	(1)	(2)	(3)	(4) No district FE
Proportion mfg. workers among population aged 16-60 years	0.010**	0.010**	0.009***	0.008***
	(0.003)	(0.003)	(0.003)	(0.002)
Proportion mfg. workers among population aged 16-60 yrs, other districts within 200 km	-0.045	-0.045		-0.016
	(0.051)	(0.051)		(0.032)
Proportion mfg. workers among population aged 16-60 yrs, rest of province			-0.004	
			(0.037)	
Individual, household characteristics				
Household head years of education		-0.000002	-0.000003	-0.000051
		(0.000043)	(0.000043)	(0.000036)
Household head is female		-0.00026	-0.00026	-0.00075**
		(0.00022)	(0.00021)	(0.00036)
Household head age in years		0.000046**	0.000046***	0.000047***
		(0.000006)	(0.000006)	(0.000008)
Household size		0.00019*	0.00019**	0.00018*
		(0.00009)	(0.00009)	(0.00010)
Other covariates				
Year is 1995	0.0155**	0.0156**	0.0142***	0.0147***
	(0.0022)	(0.0022)	(0.0019)	(0.0018)
Observations (households)	182,731	182,731	182,731	182,731
R-squared	0.11	0.11	0.11	0.08
Mean (s.d.) of dependent variable:				
1987	0.0025	0.0025	0.0025	0.0025
	(0.0076)	(0.0076)	(0.0076)	(0.0076)
1995	0.0170	0.0170	0.0170	0.0170
	(0.0327)	(0.0327)	(0.0327)	(0.0327)

Notes: Expenditure data are from SUSENAS 1987 and 1995. Due to incomplete SUSENAS 1987 data, 73 districts were omitted. These include all 29 districts in Kalimantan, all 37 districts in Sulawesi, all 5 districts in Maluku, as well as 2 districts in Nusa Tenggera. The data is unbalanced – only 37,789 household observations are from 1987. The data on the ethic of mutual cooperation is from the 1997 IFLS, which is available for 270 communities in 142 districts.

All specifications are OLS regressions with district fixed effects, except for regression 4, which does not have district fixed effects. All regressions are weighted by sample weights. Standard errors robust to heteroscedasticity and clustering of disturbance terms at the (province*year) level are given in parentheses. Significantly different than zero at 99 (***), 95 (**), and 90 percent (*) confidence.

Table B9-1: Industrialization and Elderly Co-residence

	Indicator for if a person aged at least 60 years resides with a child aged at least 18 years			
	(1)	(2)	(3)	(4) No district FE
Proportion mfg. workers among population aged 16-60 years	0.164***	0.129**	0.130**	0.412***
	(0.049)	(0.051)	(0.056)	(0.107)
Proportion mfg. workers among population aged 16-60 yrs, other districts within 200 km	0.142	0.105		-1.458***
	(0.261)	(0.230)		(0.456)
Proportion mfg. workers among population aged 16-60 yrs, rest of province			0.049	
			(0.210)	
Individual, household characteristics				
Years of education		0.012***	0.012***	0.013***
		(0.002)	(0.002)	(0.002)
Female		-0.019***	-0.019***	-0.019***
		(0.007)	(0.007)	(0.007)
Married		-0.126***	-0.126***	-0.129***
		(0.012)	(0.011)	(0.013)
Age in years		-0.0030***	-0.0030***	-0.0030***
		(0.0004)	(0.0004)	(0.0003)
Age * Female		0.0022***	0.0022***	0.0022***
		(0.0006)	(0.0006)	(0.0005)
Other covariates				
Year is 1995	-0.015**	-0.012*	-0.010*	0.029
	(0.007)	(0.006)	(0.0059)	(0.027)
Observations (individuals)	92,287	92,287	922287	92,287
R-squared	0.04	0.06	0.06	0.02
Mean (s.d.) of dependent variable:				
1985	0.587	0.587	0.587	0.587
	(0.492)	(0.492)	(0.492)	(0.492)
1995	0.584	0.584	0.584	0.584
	(0.493)	(0.493)	(0.493)	(0.493)

Notes: Data are from SUPAS 1985, 1995.

Regressions are linear probability regressions with district fixed effects and year effect, and are weighted by sample weights. Means are calculated with sample weights. Standard errors robust to heteroscedasticity and clustering of disturbance terms at the (province*year) level are given in parentheses. Significantly different than zero at 99 (***), 95 (**), and 90 percent (*) confidence.

Table B9-2: Industrialization and First Marriages Ended

	Indicator for if a woman's first marriage ended, among women aged 30-39 years old			
	(1)	(2)	(3)	(4) No district FE
Proportion mfg. workers among population aged 16-60 years	-0.238***	-0.134**	-0.100*	-0.079
	(0.033)	(0.064)	(0.058)	(0.060)
Proportion mfg. workers among population aged 16-60 yrs, other districts within 200 km	-1.417***	-1.421***		1.289***
	(0.186)	(0.179)		(0.231)
Proportion mfg. workers among population aged 16-60 yrs, rest of province			-1.283***	
			(0.175)	
Individual, household characteristics				
Years of education		-0.013***	-0.013***	-0.013***
		(0.001)	(0.001)	(0.001)
Age in years		0.0073***	0.0074***	0.0071***
		(0.0009)	(0.0000)	(0.0009)
Age at first marriage		-0.012***	-0.012***	-0.014***
		(0.002)	(0.002)	(0.002)
Other covariates				
Year is 1995	-0.043***	-0.025***	-0.026***	-0.107***
	(0.005)	(0.005)	(0.006)	(0.020)
Observations (individuals)	97,719	97,719	97,719	97,719
R-squared	0.06	0.10	0.10	0.07
Mean (s.d.) of dependent variable:				
1985	0.258	0.258	0.258	0.258
	(0.437)	(0.437)	(0.437)	(0.437)
1995	0.162	0.162	0.162	0.162
	(0.368)	(0.368)	(0.368)	(0.368)

Notes: Data are from SUPAS 1985, 1995.

Regressions are linear probability regressions with district fixed effects and year effect, and are weighted by sample weights. Means are calculated with sample weights. Standard errors robust to heteroscedasticity and clustering of disturbance terms at the (province*year) level are given in parentheses. Significantly different than zero at 99 (***), 95 (**), and 90 percent (*) confidence.