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# Returns to Relationships: Social Capital and Household Welfare in India

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**Abstract:** Sociological scholarship, economic theory, and empirical studies all indicate that interpersonal relationships are valuable productive assets and deserve to be formally incorporated into the study of human development. This paper employs the India Human Development Survey to examine, using OLS and logistic regressions, the impact of different dimensions of social capital on multiple proxies for household welfare. Social capital in the form of memberships in local community organizations and social network connections has a statistically and economically significant association with household consumption expenditures, physical asset ownership, and the probability of a household living in poverty. Households that are members of any formal community organization are expected to have higher monthly per capita consumption expenditures than households without any memberships. Estimates of a similar magnitude are observed when modeling a household's stock of physical assets, a longer-term indicator of economic welfare. These indicators of social capital are also significantly associated with lower odds of a household living below the poverty line. Organizational memberships and social networks are also associated with considerably higher odds of a household assessing its own economic situation positively. Overall, social capital is a catalyst for increasing household welfare along multiple dimensions, and, therefore, a critical area of focus for economists, sociologists, development practitioners, and policymakers.

**Keywords:** social capital; household welfare; economic development; India Human Development Survey



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## 1. Introduction

Among the many advances in human development studies over the past quarter century, there has been a strengthened focus on the social and institutional factors that influence individual wellbeing. Economists and sociologists have recognized the importance of social relationships, and the social institutions they help construct, in a variety of development questions (Stewart 2013). The concept of "social capital" has come to encompass all dimensions of interpersonal interactions—relationships, behavioral norms, networks, formal organizations, rule systems—that influence human welfare. Making use of rich scholarship, well-established theoretical models, and one of the most informative human development datasets in the world, the forthcoming analysis contributes a compelling addition to the social capital literature by identifying the economically significant returns to a range of social relationships for rural Indian households and empirically illuminating several of the critical theoretical channels by which investments in social capital improve household welfare.

Synthesizing the sociological and economic theory on the subject, this study integrates Becker's (1974) "Theory of Social Interactions" into the social capital story and employs a theoretical model that positions a utility-maximizing household's stock of social capital as an integral factor of its production. The model predicts that social capital—represented by both a household's own efforts to forge interpersonal relationships and the external

determinants of a household's larger social environment—serves a prominent role alongside human capital and tangible productive assets in influencing household welfare. The empirical exercise in this paper substantiates this idea using variables that measure household welfare, tangible assets, relevant environmental factors, and other characteristics. The study employs the India Human Development Survey (IHDS), a unique panel dataset that surveys more than 42,000 households across 1420 villages across India in two waves, first in 2005–2006, and then in 2011–2012. With an 85% re-interview rate between the two waves, the unparalleled breadth and granularity of the IHDS' social capital data, in addition to the source's distinctive range of measures of households' socioeconomic status, allow for the identification of particularly meaningful empirical results. Leveraging both waves of the IHDS, this study develops four sets of models that examine the empirical associations between different dimensions of social capital and multiple proxies for household welfare.

Consistent with the hypotheses from the theoretical model, the study shows that social capital in the form of memberships in local organizations and social network connections to influential community members has a statistically and economically significant association with higher household consumption expenditures, greater physical asset ownership, lower probability of living in poverty, and positivity in a household's subjective assessment of its economic circumstances.

Finally, this study contributes a detailed exploration of four theoretical mechanisms by which the estimated effects of social capital manifest into households' economic outcomes. Controlling for socioeconomic status and numerous household and environmental factors, the study finds compelling evidence that social capital greatly increases access to credit (specifically through microcredit programs), enhances the flow of information to households (particularly to women), and engenders confidence in public institutions (including government schools and hospitals). Higher village-level social capital indicators are also associated with lower levels of interpersonal conflict in a household's locality. The magnitudes of the effects observed in each mechanism analysis are striking and of great practical significance to development practitioners, sociologists, economists, and policymakers alike.

The literature review that follows in Section 2 provides a comprehensive overview of the dimensions of social capital and establishes the importance of the topic as it relates to economic development. This section examines seminal theoretical work, the economic impacts of social capital in developing countries observed in the empirical literature, and the World Bank's pioneering work in bringing social capital to the forefront of development economics. Section 3 provides a brief overview of an India Human Development Survey that offers a vast amount of information on social capital and serves as the empirical source for the empirical analysis. Section 4 executes a series of empirical strategies used to identify the association between various indicators of social capital and several measures of household welfare. This section also contains the interpretation of empirical results and explores several mechanisms that help explain the causal effects of social capital on household welfare. Section 5 offers the principal conclusions arising from the empirical investigation and offers some policy implications and limitations of the study. As this paper is ultimately concerned with the effects of social capital on household welfare in India, a detailed theoretical investigation of what one might consider the "returns to relationships" is provided in the Appendix A. For the same reason, a discussion of the social capital variables of interest and the operational definitions of the variables are also provided in the Appendix A.

## 2. Social Capital in the Literature

For a holistic assessment of the social capital scholarship that informs the present work, the paper begins with the earliest sociological theory that established foundational principles in the field. The paper then highlights the economic theory stemming from that work, largely focusing on the emergence of social capital in development literature. The paper examines how both sociological and economic theory inform the modeling

framework that has been frequently used in empirical social capital studies. The paper then offers a discussion of the place of Becker's (1974) "Theory of Social Interactions" in the theoretical models that ground social capital research.

### 2.1. Classical Sociological Perspectives

Among the earliest scholars of social capital in the sociological literature, Bourdieu (1986) provides a conceptual framework that has proven foundational to all subsequent research on the topic. Bourdieu argued that a proper account of the immaterial forms of capital—in his analysis, cultural and social capital—not then recognized by economic theory, was necessary for effective research in the social sciences. Bourdieu defines social capital as "the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition" (Bourdieu 1986, p. 21) Bourdieu's definition asserts that social capital's value lies in the returns to relationships, not simply the existence of relationships themselves. Indeed, he goes so far to submit that, whether consciously or not, "the profits which accrue from membership in a group are the basis of the solidarity which makes them possible" (ibid., p. 22). Networks of relationships, and the benefits that members accrue from them, are not a social given. Rather, social capital accumulation is the product of time-consuming investments aimed at institutionalizing social relationships in a manner that produces economic benefits. Investment in social capital is grounded in a recognition of what Bourdieu calls "convertibility"—while relationships do provide non-pecuniary profits (i.e., prestige, nobility), much of social capital's value stems from the fact that it can be converted into economic capital in the form of material resources that improve agents' welfare (ibid., p. 25).

Coleman (1988) describes social capital as being inherently multidimensional, with its various forms defined by their common function—they all embody social structures and facilitate actions of agents within the structures. He emphasizes the "appropriability" of social capital—the notion that an agent can leverage their social network for various purposes, such as increasing human capital in the form of education (Coleman 1988). Appraising the works of Bourdieu (1986) and Coleman (1988), Portes summarizes a consensus in the sociological literature: "social capital stands for the ability of actors to secure benefits by virtue of membership in social networks or other social structures" (Portes 1998, p. 6). The pioneering sociological work reveals several foundational ideas that inform the subsequent economic theory on social capital:

(1) While intangible, social capital is very much capital—it is an accumulated stock that can be leveraged by economic agents for a variety of productive benefits.
(2) Like all other forms of capital, social capital requires an often-significant investment on the behalf of agents.
(3) The value of social capital lies in the returns to the relationships of which it is comprised, and these returns, both pecuniary and non-pecuniary, are the basis for agents' investments.

### 2.2. Economic Extensions of Sociological Theory

Economists have extended social capital theory and made important contributions in the context of social capital's relevance to economic development studies. Putnam et al. (1993a) outline a theory of the civic community—a function of civic engagement, political equality, trust and tolerance, and associations that serve as social structures of cooperation. Studying regional differences in economic development in Italy, the authors find that the more civic a region, the more effective its public institutions and the greater its residents' overall satisfaction with life (Putnam et al. 1993a). In addition to strengthening institutional performance, networks of civic engagement and other forms of social capital foster social trust, which reduces individuals' incentives to engage in activities that benefit themselves at a detriment to other parties in economic transactions (Putnam et al. 1993b). Woolcock (1998) similarly considers social capital to be a catalyst for economic development, given its

function in solving social dilemmas and facilitating cooperative behavior at both micro and macro levels. Offering an intuitive illustration of this theoretical linkage, Woolcock writes: "The latest equipment and most innovative ideas in the hands or mind of the brightest, fittest person, however, will amount to little unless that person also has access to others to inform, correct, assist with, and disseminate their work" (Woolcock 1998, p. 154). Woolcock incorporates social capital into the vernacular of traditional economic theory by placing relationships alongside physical capital, human capital, and technology as an integral piece of the development puzzle.

Woolcock and Narayan provide a comprehensive discussion of the role of social relationships in development, calling such research "an important departure from earlier theoretical approaches" that "therefore has important implications for contemporary development research and policy" (Woolcock and Narayan 2000, p. 227). The authors' theoretical framework describes four perspectives on social capital and economic development. The "communitarian view" equates social capital with local organizations, clubs, and civic associations, emphasizing the role of relationships in promoting productive solidarity among the poor. The "networks view" focuses more intently on the sources of social capital, namely bonding and bridging ties. This view stresses the different consequences that result from intracommunity (bonding) relationships and intercommunity (bridging) networks, with bridging ties—those that cross social divides such as class, ethnicity, religion, and socioeconomic status—seen as a hallmark of greater development. The "institutional view" espouses that the effectiveness of social networks and community engagement is principally determined by the society's larger political, legal, and institutional environment. Finally, the "synergy view" unites the communitarian, networks, and institutional perspectives by focusing on the interaction between a community's social relationships and formal institutions. For effective economic development, the authors argue, the two must complement (rather than substitute for) each other (Woolcock and Narayan 2000).

Fafchamps (2006) further expands upon the theoretical link between social capital and development, explaining the dynamics between social capital and formal institutions at different stages of development. The predominant benefit of social relationships and networks is to improve the efficiency of human exchange "whether material or immaterial, economic or social". Interpersonal relationships and formal institutions both have the capacity to foster trust, which allows for more efficient exchange. Fafchamps' theory holds that community associations and social networks are most important at intermediate levels of development. Associations and networks primarily build personalized trust, which is less efficient and equitable than the generalized trust characterized by strong formal institutions and broad state organizational capacity. In under-developed economies where the state is weak and ineffective, social capital is an especially powerful force in expanding trust, creating efficient social exchange, and facilitating the provision of public goods. While they are not a substitute for institutional improvement, social capital in the form of community organizations and networks plays an essential role in developing economies (Fafchamps 2006).

More recent studies have shown similarly positive effects of social capital. For example, Ma (2002) finds that social capital helps explain the entrepreneurship activity of returned labor migrants in rural China, and that returnees' social capital yields income returns comparable to income returns of investment capital and human capital. Kim (2009) finds that access to social capital increases prestige for urban lawyers in Chicago and provides better-quality work-related information that leads to higher economic returns. Engbers et al. (2017a) find that bridging social capital improves the economic well-being of American metropolitan communities, specifically with respect to job creation. Using the China Family Panel Studies, Li et al. (2022) find that farmers with low educational attainment relied on social capital to access informal financing channels, allowing them to alleviate credit constraints in order to achieve both environmentally friendly practices and operational scale efficiency. In a study of intellectual networks, Henriksen et al. (2022) find that in the 1960s and 1970s, the Chicago School of economics fostered a cohesive community of

senior and junior scholars that allowed it to transmit value orientations across generations and effectively promote its professional, political, and economic interests and networks. Their strong intergenerational cohesion and solidarity of their social network, the authors show, allowed them to outcompete their rivals in the "Charles River Group" (Keynesian economists mainly at Harvard and MIT), ultimately bringing about a "tectonic epistemic shift" away from Keynesian macroeconomic thinking to neoliberal dominance (Henriksen et al. 2022, p. 1007). Most recently, Cao et al. (2022) show that by enabling collective action against excessive government procurement, household social capital helped reduce mortality rates during China's great famine (1958–1961).

### 2.3. Empirical Applications of Social Capital Theory in Development Literature

In 1996, the World Bank launched the pioneering Social Capital Initiative (SCI) to contribute to the development of social capital indicators and measure their impact on development projects. Grootaert and Bastelaer's (2001) synthesis of SCI findings details the significance of social capital in widespread development contexts across numerous countries. The World Bank research indicates that social capital is particularly effective in enhancing information flow to the poor and that the creation of social capital requires a time-consuming and likely substantial investment (Grootaert and Bastelaer 2001).

The empirical literature on social capital and development relies on a consistent modeling framework that has a strong theoretical foundation in both economics and sociology, treating social capital as one among several productive assets that facilitate a household's consumption expenditures. This canonical model estimates a household's per capita consumption expenditures as a function of its stock of social capital, human capital, other productive assets, and vectors of household-specific and village- and region-specific characteristics.

The model is rooted in Becker's (1974) "Theory of Social Interactions", the first theoretical work to integrate what scholars now call social capital into microeconomic explanations of household welfare. Becker defines a household production function with utility-generating commodities produced as a function of market goods, variables representing the economic environment of the household, and a household's social capital. Becker's model positions a household's stock of social capital as an integral factor in determining its welfare. The model explicitly validates the concept that social capital—represented by both a household's own efforts to forge productive interpersonal relationships and the external determinants of a household's larger social-institutional environment—serves a prominent role alongside human capital and physical assets in influencing household welfare. In this way, relationships, and the associated social structures that they help build, accrue economic returns to households. A detailed description of Becker's model is presented in the Appendix A.

Examining the role of social capital as a determinant of household income in rural Tanzania, Narayan and Pritchett (1999) find that a one-standard deviation increase in a village's social capital index is associated with a 20% increase in consumption expenditures for each household. Notably, this impact is significantly larger than the marginal effect of an increase in education and comparable to the effect of an increase in nonfarm physical assets. The authors tackle the complicating issue that group membership may simply be a consumption good that is increasingly demanded at higher levels of income. Using survey questions regarding social and institutional trust as instrumental variables, the authors affirm that social capital is, in fact, capital. In their analysis of social capital and household welfare in Burkina Faso, Grootaert et al. (2002), also employing instrumental variable analysis, find that a 5% increase in a household's social capital endowment corresponds to 2.7% increase in household consumption. By comparison, a 5% increase in human capital endowment is associated with a mere 0.2% increase in consumption. Using quantile regression, the authors find that returns to social capital are highest at the lowest levels of income and decline as income rises—the wealthiest 25% of households in their sample saw no significant returns to social capital. Similar studies, all employing a version of

the social capital model described above, have reiterated these findings across numerous developing countries (e.g., Vietnam: Van Ha et al. 2004; Nigeria: Okunmadewa et al. 2007; Indonesia: Grootaert 1999; Cameroon: Johannes 2011; rural South Africa: Baiyegunhi 2013; Pakistan: Ahmad and Sadaqat 2016; Akbar and Aldrich 2018; Khan 2020; the Philippines: Luu et al. 2022).

### 2.4. Social Capital Research in the Indian Context

In the Indian household survey, social capital in the form of involvement in local community associations has been shown to be positively associated with consumption expenditures (Arun et al. 2016) and income from business (Jaikumar and Kumari 2021). Moreover, a household's number of formal sector contacts is significantly associated with increased odds of attending college for Indian youths in the IHDS (Myroniuk et al. 2017). The data further reveal that both bridging and bonding social capital are valuable in addressing child undernutrition in rural India (Story and Carpiano 2017), as well as addressing access to piped water (Sarkhel and Paul 2019). Community-level social capital is also a determinant of households' reported utilization of maternal and child health services (Story 2014). Social networks appear to play a substantial role in explaining households' participation in microcredit programs (Langer 2009), the decision to vote in a national election (Borooah and Bros 2012), and schooling outcomes for rural children (Iyengar 2011). Evidence surrounding the relatively large social networks of scheduled castes and tribes in urban areas could have promising implications for the Indian reservation system (Vanneman et al. 2006). At the local level, greater social cohesion between sub-communities in a village was found to boost cooperative behavior (Girard 2011), while poor community-level social conditions—harassment of women and girls, crime, violence—are associated with both preterm birth and low infant birth weight (Baker et al. 2018). The social capital data in the IHDS has a wide range of applications in the economic literature and the source lends itself well to the study of household welfare.

## 3. Materials and Methods

The India Human Development Survey (IHDS) is a nationally representative, multitopic survey administered in 2004–2005 and 2011–2012. Both survey waves cover all states and union territories of India, except for Andaman and Nicobar and Lakshadweep. The comprehensive datasets include numerous measures of social capital and a host of other human development indicators (Desai and Vanneman 2015). In 2004–2005, IHDS researchers surveyed 41,554 urban and rural households (215,754 individuals) across 33 states and union territories, 384 districts, 1503 villages, and 971 urban blocks located in 276 towns and cities (Desai et al. 2009) with a total response rate of 92 percent (Desai and Vanneman 2019). The 2011–2012 wave surveyed 42,152 households, with 85% of the households from the first wave re-interviewed in this cycle (Desai and Vanneman 2019). The remarkably high re-interview rate allows for the construction of one of the largest panel surveys in the world (National Council of Applied Economic Research 2018).

From these two waves of IHDS surveys, a rural panel dataset is constructed. Village surveys, which contain key information on local socioeconomic contexts, were only administered to sample areas classified as villages, as opposed to urban blocks. The resulting sample from merging these two waves of household surveys contains 41,750 observations for 20,875 unique rural households spread across 1437 villages spanning 269 census districts in 31 Indian states and union territories.

### *Empirical Analysis*

This paper extends the existing literature by modeling the impact of social capital on four separate outcome variables that proxy household welfare—per capita consumption expenditures, physical asset ownership, a binary indicator of poverty status, and households' subjective assessment of their economic welfare relative to a past benchmark.

Many empirical social capital studies use per capita consumption expenditures as a proxy for household welfare, because in developing countries, consumption expenditures, compared to income, better capture true standards of living, are less seasonally volatile, and are less susceptible to measurement error in household surveys (Moratti and Natali 2012). Compared to consumption expenditures, however, asset-based wealth indices may better reflect households' long-term economic position (Moratti and Natali 2012; Desai and Vanneman 2015), while poverty status models may be of greater interest to policymakers. Finally, the subjective gauge of economic circumstances offered by the survey lends unique agency to rural households' independent assessment of their welfare.

In each of the four model specifications, social capital is introduced across two distinct categories—organizational memberships and social networks. The models are presented in this manner to examine specific dimensions of social capital individually, rather than constructing an aggregate social capital index. The IHDS' social capital questionnaire surveys households' memberships in ten formal community groups. This group membership data is operationalized in several ways: an indicator of membership in any organization, the total number of memberships affiliated to a household, indicators of membership in either bonding organizations (religious/social/festival groups and caste associations) or bridging organizations (self-help groups, credit/savings groups, and development groups), and indicators of membership in each individual group.

Additionally, the IHDS provides a wealth of information on households' interpersonal social networks, including proximity to influential persons. The surveys ask if the household has any personal acquaintance(s) in the health, education, and government service fields, and whether these relationships are with persons among the household's relatives/caste/community (bonding social capital) or with individuals outside of these spheres (bridging social capital). Such rich data on connections to persons of influence are surprisingly rare in the existing social capital literature, though Van Ha et al.'s (2004) study of Vietnam indicates that such variables may be particularly powerful social capital indicators. The IHDS also asks whether households have close relationships with a panchayat member, both in and outside the household; these variables are employed in one of the social network models.

The empirical specifications for the four models are as follows:

$$lnE_i = \alpha + \beta SC_i + \gamma HC_i + \delta OC_i + \eta X_i + \theta Z_i + \tau T_i + \varepsilon_i, \quad (1)$$

$$ln(A_i + 1) = \alpha + \beta SC_i + \gamma HC_i + \delta OC_i + \eta X_i + \theta Z_i + \tau T_i + \varepsilon_i, \quad (2)$$

$$Prob(P_i = 1|SC_i, HC_i, OC_i, X_i, Z_i, T_i) = \frac{1}{1 + e^{-(\alpha + \beta SC_i + \gamma HC_i + \delta OC_i + \eta X_i + \theta Z_i + \tau T_i + \varepsilon_i)}}, \quad (3)$$

$$Prob(S_i = 1|A_i, SC_i, HC_i, OC_i, X_i, Z_i, T_i) = \frac{1}{1 + e^{-(\alpha + \pi A_i + \beta SC_i + \gamma HC_i + \delta OC_i + \eta X_i + \theta Z_i + \tau T_i + \varepsilon_i)}} \quad (4)$$

$E_i$ represents monthly per capita consumption expenditures of the $i$-th household, $A_i$ is the household's asset index, $P_i$ is a dichotomous variable equal to one if the household is below the poverty line, and $S_i$ is a dichotomous variable equal to one if the household indicated that it views its economic situation as better off relative to a past benchmark. Each model introduces measures of social capital, $SC_i$, in a stepwise fashion across the aforementioned two categories of organizational memberships and social networks. $HC_i$ captures human capital by the highest years of education attained by an adult in the household. $OC_i$ accounts for the household's other productive assets with indicators of both land ownership and ownership of a nonfarm business. $X_i$ controls for the following household characteristics: an indicator if the household is Muslim, an indicator of Scheduled Caste or Scheduled Tribe status, number of children, percentage of household members working full-time, and indicators of employment in salaried work and organized business work. $Z_i$ captures the household's local economic environment with its village infrastructure level (a village with "good" infrastructure is defined as having access to paved roads and

greater than 75% of households with electricity, whereas poor infrastructure is classified as having a lack of paved roads or less than 75% electricity access; see Story and Carpiano 2017) as well as district and region fixed effects (states are classified into regions BIMARU, North, South, East, and Others based on Arun et al. 2016; North is the omitted category in all models). These fixed effects control for unobservable variables at the local and regional levels that may impact household welfare. $T_i$ is a time fixed effect that controls for unobservable changes between the 2005 and 2012 waves of the IHDS surveys. The model of subjective household welfare additionally controls for a household's asset index score. Finally, in all models, the study clusters standard errors at the village level. These heteroskedasticity-robust standard errors allow the regression errors, $\varepsilon_i$, to be correlated within villages based on unobservable factors that might affect the welfare of households belonging to the same village but assume independence in errors across different villages.

## 4. Results

This section presents the core results from each of the above models. Unless otherwise specified, all results discussed in this text are statistically significant at the level of 5% or lower. Estimates pertaining to social capital variables are compared to the estimates for the education and land ownership variables. In assessing the returns to social capital, it is useful to make comparisons to the returns to the other factors—human and physical capital—in a household's production function. In each model, variance inflation factors are below five for all included regressors, indicating that problematic levels of multicollinearity do not surface in these results. (Full regression output is available from the authors upon request. This empirical investigation is supplemented with additional analytical rigor, employing both instrumental variable analysis and Clausen et al. (2011) methodology for analyzing potential reverse causality in model estimates. These results are available upon request. Note also that the findings are robust not only to a broad set of outcome variables, but also to multiple tests for potential reverse causality; these results are available from the authors upon request. Finally, $(e^{\beta-1}) * 100\%$ is used to calculate marginal effects of all dichotomous independent variables.)

Principal findings are organized in five subsections. Section 4.1 reports the effects of organizational membership and social networks on per capita consumption. Section 4.2 presents results for the effects of organizational membership and social network indicators on household asset ownership—an index of material wealth that serves as an additional proxy for economic welfare. Section 4.3 presents logistic modeling results of a household's probability of being in poverty as a function of the household's organizational memberships and social networks. Section 4.4 presents the effects of social capital indicators on a household's subjective perception of its own economic wellbeing. Finally, Section 4.5 presents an examination of four specific channels through which social capital drives the economic outcomes detailed in Section 4.1, Section 4.2 andSection 4.3, and the nonpecuniary outcome in Section 4.4.

### *4.1. Social Capital and Consumption Expenditures*

#### 4.1.1. Organizational Memberships

Table 1 presents results with the estimates of organizational membership indicators on monthly per capita consumption expenditures. Households that are members of any formal community organization are expected to have 9.6% higher monthly per capita consumption expenditures than those that do not hold any memberships. Notably, this marginal effect is approximately equivalent to a five-year increase in a household's highest level of educational attainment. On a continuous scale, an additional group membership is associated with a 4.4% increase in consumption. Membership in bonding organizations—associations that are usually comprised of more homogenous households—generates nearly twice the average expenditure premium (8.3%) as membership in bridging organizations (4.7%), which tend to draw from relatively more diverse social spheres. Except for self-help groups, all indicators of membership in individual organizations are positively associated with

consumption relative to membership in a Mahila mandal–a women's community group, employed as the reference group in this study (Arun et al. 2016). Agricultural cooperatives and union/business/professional groups are associated with the highest expected consumption increases for their members, at 14.8% and 13.3%, respectively. These magnitudes are roughly equivalent to the effect of land ownership, which is linked to roughly 14% higher monthly expenditures across models. All control variables are statistically significant with economically significant magnitudes and theoretically expected signs.

**Table 1.** OLS regression estimates: effects of formal group membership on per capita consumption expenditures.

| | (Model 1) | (Model 2) | (Model 3) | (Model 4) |
|---|---|---|---|---|
| **Variables** | **Indicator of Membership** | **Total Memberships** | **Organization Type** | **Individual Memberships** |
| Social Capital Variables | | | | |
| Membership in Any Formal Community Organization | 0.092 *** | | | |
| | (0.008) | | | |
| Total Number of Memberships Affiliated to Household | | 0.044 *** | | |
| | | (0.003) | | |
| Indicator of Memberships in Any Bonding Organization | | | 0.080 *** | |
| | | | (0.010) | |
| Indicator of Membership in Any Bridging Organization | | | 0.046 *** | |
| | | | (0.009) | |
| Member: Youth Club/Sports Group/Reading Room | | | | 0.049 ** |
| | | | | (0.020) |
| Member: Union/Business/Professional Group | | | | 0.125 *** |
| | | | | (0.021) |
| Member: Self-Help Group | | | | −0.007 |
| | | | | (0.010) |
| Member: Credit/Savings Group | | | | 0.053 *** |
| | | | | (0.012) |
| Member: Religious Group/Social Group/Festival Society | | | | 0.067 *** |
| | | | | (0.012) |
| Member: Caste Association | | | | 0.025 * |
| | | | | (0.013) |
| Member: Development Group | | | | 0.066 ** |
| | | | | (0.026) |
| Member: Agricultural Cooperative | | | | 0.138 *** |
| | | | | (0.017) |
| Comparative Controls | | | | |
| Highest Years of Education Attained by Adult in Household | 0.020 *** | 0.020 *** | 0.020 *** | 0.020 *** |
| | (0.001) | (0.001) | (0.001) | (0.001) |
| Indicator of Land Ownership | 0.135 *** | 0.134 *** | 0.137 *** | 0.130 *** |
| | (0.008) | (0.008) | (0.008) | (0.008) |
| Muslim Indicator | −0.037 ** | −0.038 *** | −0.038 *** | −0.037 ** |
| | (0.014) | (0.015) | (0.015) | (0.014) |
| Additional Controls | | | | |
| Scheduled Caste or Scheduled Tribe Indicator | −0.177 *** | −0.178 *** | −0.176 *** | −0.173 *** |
| | (0.008) | (0.008) | (0.008) | (0.008) |
| Number of Children | −0.121 *** | −0.121 *** | −0.120 *** | −0.121 *** |
| | (0.002) | (0.002) | (0.002) | (0.002) |
| Percentage of Household Members Working Full-Time | 0.120 *** | 0.122 *** | 0.126 *** | 0.124 *** |
| | (0.014) | (0.014) | (0.014) | (0.014) |
| Indicator of Ownership of a Nonfarm Business | 0.090 *** | 0.089 *** | 0.090 *** | 0.086 *** |
| | (0.008) | (0.008) | (0.009) | (0.008) |
| Principal Income Source: Salaried Employment | 0.262 *** | 0.261 *** | 0.262 *** | 0.260 *** |
| | (0.011) | (0.011) | (0.011) | (0.011) |
| Principal Income Source: Organized Business | 0.191 *** | 0.190 *** | 0.186 *** | 0.186 *** |
| | (0.025) | (0.025) | (0.025) | (0.025) |
| Indicator of Good Village Infrastructure | 0.067 *** | 0.064 *** | 0.066 *** | 0.065 *** |
| | (0.011) | (0.011) | (0.012) | (0.011) |
| Observations | 41,190 | 41,145 | 40,108 | 41,188 |
| Region, District, and Year FE | YES | YES | YES | YES |
| Adj. R-squared | 0.448 | 0.449 | 0.444 | 0.450 |

Note: Clustered (village-level) standard-errors in parentheses; * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

#### 4.1.2. Social Networks

Table 2 displays results with the effects of social network variables on household consumption. An additional connection to a health, education, or government service professional is associated with an 8.9% increase in a household's consumption expenditures. Network connections that engender bonding social capital—ties to influential persons within a household's relatives/caste/community—have substantively higher associated returns than bridging connections to such persons outside of the household's immediate social strata. Government service employees appear to be the most valuable relationship for households—the 15.7% consumption premium for households connected to such persons is over twice as large as the increase in consumption expenditures associated with ties to health and education professionals. Households that are home to panchayat members can expect 12.6% higher expenditures, whereas households with a close relationship to a non-resident panchayat member see a 6.7% average increase in consumption expenditures. Comparably, an additional year of highest adult educational attainment is associated with 1.6% to 2.1% increases in consumption across different models. All control variables are significant at the 5% level, with similar magnitudes to those observed in the models shown in Table 1.

**Table 2.** OLS regression estimates: effects of influential network connections on per capita consumption expenditures.

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| **Variables** | **Total Network Connections** | **Individual Connections (Within Community)** | **Individual Connections (Outside Community)** | **Individual Connections (Any)** | **Panchayat Connections** |
| Health, Education, and Gov. Service Network Connections | 0.089 *** | | | | |
| | (0.004) | | | | |
| Indicator of Health Professional in *Bonding* Network | | 0.102 *** | | | |
| | | (0.008) | | | |
| Indicator of Education Professional in *Bonding* Network | | 0.082 *** | | | |
| | | (0.007) | | | |
| Indicator of Gov. Service Professional in *Bonding* Network | | 0.139 *** | | | |
| | | (0.009) | | | |
| Indicator of Health Professional in *Bridging* Network | | | 0.042 *** | | |
| | | | (0.007) | | |
| Indicator of Education Professional in *Bridging* Network | | | 0.033 *** | | |
| | | | (0.007) | | |
| Indicator of Gov. Service Professional in *Bridging* Network | | | 0.103 *** | | |
| | | | (0.010) | | |
| Indicator of Health Professional in Either Network | | | | 0.066 *** | |
| | | | | (0.007) | |
| Indicator of Education Professional in Either Network | | | | 0.067 *** | |
| | | | | (0.007) | |
| Indicator of Gov. Service Professional in Either Network | | | | 0.146 *** | |
| | | | | (0.008) | |
| Indicator of Panchayat Member in Household | | | | | 0.119 *** |
| | | | | | (0.035) |
| Indicator of Panchayat Member Close to Household | | | | | 0.065 *** |
| | | | | | (0.009) |
| Highest Years of Education Attained by Adult in Household | 0.016 *** | 0.017 *** | 0.019 *** | 0.016 *** | 0.021 *** |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| Indicator of Land Ownership | 0.126 *** | 0.123 *** | 0.137 *** | 0.125 *** | 0.134 *** |
| | (0.008) | (0.008) | (0.008) | (0.008) | (0.008) |
| Observations | 40,814 | 40,873 | 40,807 | 40,814 | 39,755 |
| Region, District, and Year FE | YES | YES | YES | YES | YES |
| Additional Controls | YES | YES | YES | YES | YES |
| Adj. R-squared | 0.460 | 0.459 | 0.450 | 0.462 | 0.444 |

Note: Clustered (village-level) standard-errors in parentheses; * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

### 4.2. Social Capital and Physical Asset Ownership

Tables 3 and 4 present results for the effects of organizational membership and social network indicators, respectively, on household asset ownership—an index of material wealth that serves as an additional proxy for economic welfare. Across all models, the adjusted-$R^2$ value is slightly higher than those observed in the models of consumption expenditures, indicating that the sample variance in this less volatile, more long-term measure of household welfare is better explained by the social capital and control variables. Across all dimensions of social capital, estimated effects on physical asset ownership mirror the results observed in the consumption expenditure models, reinforcing the vital role of relationships in determining household welfare regardless of the chosen economic proxy.

**Table 3.** OLS regression estimates: effects of formal group memberships on physical asset ownership.

| | (Model 1) | (Model 2) | (Model 3) | (Model 4) |
|---|---|---|---|---|
| **Variables** | **Indicator of Membership** | **Total Memberships** | **Organization Type** | **Individual Memberships** |
| Membership in Any Formal Community Organization | 0.097 *** | | | |
| | (0.005) | | | |
| Total Number of Memberships Affiliated to Household | | 0.041 *** | | |
| | | (0.007) | | |
| Indicator of Membership in Any Bridging Organization | | | 0.075 *** | |
| | | | (0.006) | |
| Member: Youth Club/Sports Group/Reading Room | | | | 0.045 *** |
| | | | | (0.012) |
| Member: Union/Business/Professional Group | | | | 0.077 *** |
| | | | | (0.010) |
| Member: Self-Help Group | | | | 0.046 *** |
| | | | | (0.007) |
| Member: Credit/Savings Group | | | | 0.051 *** |
| | | | | (0.008) |
| Member: Religious Group/Social Group/Festival Society | | | | 0.068 *** |
| | | | | (0.008) |
| Member: Caste Association | | | | 0.028 *** |
| | | | | (0.008) |
| Member: Development Group | | | | 0.004 |
| | | | | (0.017) |
| Member: Agricultural Cooperative | | | | 0.058 *** |
| | | | | (0.009) |
| Highest Years of Education Attained by Adult in Household | 0.039 *** | 0.039 *** | 0.039 *** | 0.039 *** |
| | (0.001) | (0.001) | (0.001) | (0.001) |
| Indicator of Land Ownership | 0.118 *** | 0.117 *** | 0.121 *** | 0.116 *** |
| | (0.006) | (0.006) | (0.006) | (0.006) |
| Observations | 41,209 | 41,163 | 40,126 | 41,206 |
| Region, District, and Year FE | YES | YES | YES | YES |
| Additional Controls | YES | YES | YES | YES |
| Adj. R-squared | 0.528 | 0.528 | 0.526 | 0.528 |

Note: Clustered (village-level) standard-errors in parentheses; * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

**Table 4.** OLS regression estimates: effects of influential network connections on physical asset ownership.

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| **Variables** | **Total Network Connections** | **Individual Connections (Within Community)** | **Individual Connections (Outside Community)** | **Individual Connections (Any)** | **Panchayat Connections** |
| Health, Education, and Gov. Service Network Connections | 0.070 *** | | | | |
| | (0.002) | | | | |
| Indicator of Health Professional in *Bonding* Network | | 0.062 *** | | | |
| | | (0.005) | | | |
| Indicator of Education Professional in *Bonding* Network | | 0.069 *** | | | |
| | | (0.005) | | | |
| Indicator of Gov. Service Professional in *Bonding* Network | | 0.090 *** | | | |
| | | (0.006) | | | |
| Indicator of Health Professional in *Bridging* Network | | | 0.040 *** | | |
| | | | (0.005) | | |
| Indicator of Education Professional in *Bridging* Network | | | 0.038 *** | | |
| | | | (0.005) | | |
| Indicator of Gov. Service Professional in *Bridging* Network | | | 0.081 *** | | |
| | | | (0.006) | | |
| Indicator of Health Professional in Either Network | | | | 0.049 *** | |
| | | | | (0.005) | |
| Indicator of Education Professional in Either Network | | | | 0.064 *** | |
| | | | | (0.005) | |
| Indicator of Gov. Service Professional in Either Network | | | | 0.104 *** | |
| | | | | (0.005) | |
| Indicator of Panchayat Member in Household | | | | | 0.074 *** |
| | | | | | (0.018) |
| Indicator of Panchayat Member Close to Household | | | | | 0.043 *** |
| | | | | | (0.005) |
| Highest Years of Education Attained by Adult in Household | 0.036 *** | 0.037 *** | 0.038 *** | 0.036 *** | 0.040 *** |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| Indicator of Land Ownership | 0.113 *** | 0.112 *** | 0.121 *** | 0.112 *** | 0.119 *** |
| | (0.006) | (0.006) | (0.006) | (0.006) | (0.006) |
| Observations | 40,829 | 40,888 | 40,822 | 40,829 | 39,773 |
| Region, District, and Year FE | YES | YES | YES | YES | YES |
| Additional Controls | YES | YES | YES | YES | YES |
| Adj. R-squared | 0.538 | 0.533 | 0.529 | 0.539 | 0.522 |

Note: Clustered (village-level) standard-errors in parentheses; * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

#### 4.2.1. Organizational Memberships

Asset-based returns to membership in formal community organizations closely resemble estimates for consumption expenditures. The median household owns 10 of the 30 assets in the index, and membership in any local organization is associated with an increase of three additional major consumer appliances, durable goods, or housing provisions (10.2% increase). This marginal impact is roughly equivalent to that of an additional two and a half years of schooling for a household's highest-educated adult. Unlike with consumption expenditures, membership in bonding (7.47%) and bridging (7.79%) organizations provide similar expected asset stock increases. Moreover, self-help groups do provide significant returns (4.71%) to household assets (relative to Mahila mandal membership), whereas membership in development groups does not. Agricultural cooperative membership, the most valuable organizational tie in the consumption model, has a much more muted impact on asset ownership (5.97%).

#### 4.2.2. Social Networks

Returns to influential network connections are statistically and economically significant in their association with physical asset ownership, though the magnitude of impact is

slightly lower for each measure when compared to returns associated with consumption expenditures. Close-affinity connections to health, education, and government service contacts, which represent bonding social capital, are associated with higher asset ownership than outside bridging social capital. Ties to government service professionals have the strongest association with asset ownership (11.0% increase), echoing the results for consumption. Following the same pattern, households with a panchayat member in their ranks see nearly double the marginal impact (7.68%) on asset ownership as households with a close relationship to such an official outside their own home (4.39%).

### 4.3. Social Capital and Poverty

Logistic modeling of a household's probability of being in poverty is a common supplementary strategy used to investigate the impact of social capital on household welfare (e.g., Grootaert et al. 2002; Okunmadewa et al. 2007; Ahmad and Sadaqat 2016). Tables 5 and 6 provide the odds ratio associated with each regressor, where the dependent variable is a dichotomous indicator equal to one if a household's consumption expenditures per capita place it below the IHDS' constructed poverty line. Thus, significant odds ratios below zero indicate lower odds of being in poverty.

**Table 5.** Logistic regression estimates: effects of formal group memberships on binary poverty indicator (odds ratios).

| | (Model 1) | (Model 2) | (Model 3) | (Model 4) |
|---|---|---|---|---|
| **Variables** | **Indicator of Membership** | **Total Memberships** | **Organization Type** | **Individual Memberships** |
| Membership in Any Formal Community Organization | 0.705 *** | | | |
| | (0.028) | | | |
| Total Number of Memberships Affiliated to Household | | 0.842 *** | | |
| | | (0.017) | | |
| Indicator of Memberships in Any Bonding Organization | | | 0.701 *** | |
| | | | (0.040) | |
| Indicator of Membership in Any Bridging Organization | | | 0.834 *** | |
| | | | (0.038) | |
| Member: Youth Club/Sports Group/Reading Room | | | | 0.792 * |
| | | | | (0.103) |
| Member: Union/Business/ Professional Group | | | | 0.717 ** |
| | | | | (0.096) |
| Member: Self-Help Group | | | | 0.957 |
| | | | | (0.050) |
| Member: Credit/Savings Group | | | | 0.837 *** |
| | | | | (0.055) |
| Member: Religious Group/Social Group/Festival Society | | | | 0.769 *** |
| | | | | (0.053) |
| Member: Caste Association | | | | 0.789 *** |
| | | | | (0.058) |
| Member: Development Group | | | | 0.718 * |
| | | | | (0.131) |
| Member: Agricultural Cooperative | | | | 0.609 *** |
| | | | | (0.074) |
| Highest Years of Education Attained by Adult in Household | 0.931 *** | 0.932 *** | 0.931 *** | 0.932 *** |
| | (0.003) | (0.004) | (0.004) | (0.004) |
| Indicator of Land Ownership | 0.584 *** | 0.586 *** | 0.586 *** | 0.593 *** |
| | (0.022) | (0.022) | (0.022) | (0.022) |
| Observations | 41,036 | 40,991 | 39,985 | 41,034 |
| Region, District, and Year FE | YES | YES | YES | YES |
| Additional Controls | YES | YES | YES | YES |
| Pseudo R-squared | 0.257 | 0.258 | 0.257 | 0.258 |
| Log Likelihood | −15,421 | −15,396 | −15,097 | −15,398 |

Note: Clustered (village-level) standard-errors in parentheses; * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

**Table 6.** Logistic regression estimates: effects of influential network connections on binary poverty indicator (odds ratios).

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| **Variables** | **Total Network Connections** | **Individual Connections (Within Community)** | **Individual Connections (Outside Community)** | **Individual Connections (Any)** | **Panchayat Connections** |
| Health, Education, and Gov. Service Network Connections | 0.701 *** | | | | |
| | (0.014) | | | | |
| Indicator of Health Professional in *Bonding* Network | | 0.628 *** | | | |
| | | (0.035) | | | |
| Indicator of Education Professional in *Bonding* Network | | 0.693 *** | | | |
| | | (0.031) | | | |
| Indicator of Gov. Service Professional in *Bonding* Network | | 0.609 *** | | | |
| | | (0.038) | | | |
| Indicator of Health Professional in *Bridging* Network | | | 0.837 *** | | |
| | | | (0.038) | | |
| Indicator of Education Professional in *Bridging* Network | | | 0.789 *** | | |
| | | | (0.035) | | |
| Indicator of Gov. Service Professional in *Bridging* Network | | | 0.728 *** | | |
| | | | (0.042) | | |
| Indicator of Health Professional in Either Network | | | | 0.760 *** | |
| | | | | (0.034) | |
| Indicator of Education Professional in Either Network | | | | 0.713 *** | |
| | | | | (0.028) | |
| Indicator of Gov. Service Professional in Either Network | | | | 0.610 *** | |
| | | | | (0.031) | |
| Indicator of Panchayat Member in Household | | | | | 0.830 |
| | | | | | (0.149) |
| Indicator of Panchayat Member Close to Household | | | | | 0.796 *** |
| | | | | | (0.042) |
| Highest Years of Education Attained by Adult in Household | 0.943 *** | 0.941 *** | 0.934 *** | 0.943 *** | 0.929 *** |
| | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) |
| Indicator of Land Ownership | 0.603 *** | 0.608 *** | 0.583 *** | 0.603 *** | 0.589 *** |
| | (0.023) | (0.023) | (0.022) | (0.023) | (0.022) |
| Observations | 40,661 | 40,720 | 40,654 | 40,661 | 39,605 |
| Region, District, and Year FE | YES | YES | YES | YES | YES |
| Additional Controls | YES | YES | YES | YES | YES |
| Pseudo R-squared | 0.266 | 0.264 | 0.259 | 0.267 | 0.257 |
| Log Likelihood | −15,081 | −15,145 | −15,229 | −15,074 | −14,953 |

Note: Clustered (village-level) standard-errors in parentheses; * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

#### 4.3.1. Organizational Memberships

Membership in any community organization is associated with 30% greater odds of a household being above the poverty line, while each additional group membership is expected to increase a household's odds of living above the poverty threshold by 16%. Bonding organizations (29.9% greater odds) are nearly twice as consequential as bridging organizations (16.6%) in their association with above-poverty expenditure levels. Members of an agricultural cooperative are expected to have 39% lower odds of living in poverty, by far the largest marginal effect of any specific group relative to membership in a Mahila mandal. Remarkably, this magnitude is comparable to the marginal effect of land ownership and nearly six times as large as that associated with an additional year of highest educational attainment.

#### 4.3.2. Social Networks

An additional health, education, or government service professional in a household's social network is associated with 30% higher odds of being above the poverty line. A connection to a government service employee has the largest marginal increase (39%

greater odds.) The odds of being above the poverty line associated with both health (24.0%) and education (28.7%) professionals are each over four times the magnitude of the effect of an additional year of schooling for a household's highest-educated adult (between 5.7% and 7.1% across models). Following a similar trend observed in consumption and asset ownership results, connections to persons of influence in a bonding setting are associated with lower odds of being below the poverty line than those connections in bridging social spheres. While households with panchayat officials as members do not exhibit statistically significant changes in odds of being in poverty, having a panchayat member close to the household is associated with 20% higher odds of living above the poverty line.

### *4.4. Social Capital and Subjective Household Welfare*

Modeling a household's perception of its own economic situation provides a unique opportunity to estimate the effects of social capital indicators on household welfare in a non-pecuniary (or at least not entirely pecuniary) context. By providing the household with a reference point in the past and allowing it to gauge its own measure of economic circumstances, this variable can potentially capture aspects of household welfare that are unobserved when using consumption expenditure, asset index, or poverty line proxies.

Tables 7 and 8 present logistic model estimates where the dependent variable is a binary indicator of a household's response to the survey's inquiry regarding its self-perceived economic situation; the variable takes the value of one if "better off" compared to previous years, and zero if "worse off" or "same". The same set of controls is used as in previous sections, with the addition of a household's asset index. This longer-term measure of financial welfare is included to control for the monetary considerations that do factor into household respondents' subjective perceptions of their economic situation.

**Table 7.** Logistic regression estimates: effects of formal group memberships on subjective economic welfare (odds ratios).

| | (Model 1) | (Model 2) | (Model 3) | (Model 4) |
|---|---|---|---|---|
| **Variables** | **Indicator of Membership** | **Total Memberships** | **Organization Type** | **Individual Memberships** |
| Membership in Any Formal Community Organization | 1.184 ***<br>(0.039) | | | |
| Total Number of Memberships Affiliated to Household | | 1.089 ***<br>(0.015) | | |
| Indicator of Memberships in Any Bonding Organization | | | 1.163 ***<br>(0.054) | |
| Indicator of Membership in Any Bridging Organization | | | 1.180 ***<br>(0.044) | |
| Member: Youth Club/Sports Group/Reading Room | | | | 1.227 **<br>(0.101) |
| Member: Union/Business/ Professional Group | | | | 0.986<br>(0.079) |
| Member: Self-Help Group | | | | 1.207 ***<br>(0.050) |
| Member: Credit/Savings Group | | | | 0.954<br>(0.050) |
| Member: Religious Group/Social Group/Festival Society | | | | 1.027<br>(0.054) |
| Member: Caste Association | | | | 1.183 ***<br>(0.068) |
| Member: Development Group | | | | 1.441 ***<br>(0.160) |
| Member: Agricultural Cooperative | | | | 1.064<br>(0.072) |

**Table 7.** *Cont.*

| | (Model 1) | (Model 2) | (Model 3) | (Model 4) |
|---|---|---|---|---|
| **Variables** | **Indicator of Membership** | **Total Memberships** | **Organization Type** | **Individual Memberships** |
| Asset Index | 1.153 *** (0.005) | 1.152 *** (0.005) | 1.152 *** (0.005) | 1.153 *** (0.005) |
| Highest Years of Education Attained by Adult in Household | 1.019 *** (0.003) | 1.019 *** (0.003) | 1.018 *** (0.003) | 1.019 *** (0.003) |
| Indicator of Land Ownership | 1.435 *** (0.047) | 1.432 *** (0.047) | 1.443 *** (0.048) | 1.431 *** (0.047) |
| Observations | 40,859 | 40,813 | 39,805 | 40,856 |
| Region, District, and Year FE | YES | YES | YES | YES |
| Additional Controls | YES | YES | YES | YES |
| Pseudo R-squared | 0.150 | 0.151 | 0.151 | 0.151 |
| Log Likelihood | −23,412 | −23,374 | −22,777 | −23,391 |

Note: Clustered (village-level) standard-errors in parentheses; * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

**Table 8.** Logistic regression estimates: effects of influential network connections on subjective economic welfare (odds ratios).

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| **Variables** | **Total Network Connections** | **Individual Connections (Within Community)** | **Individual Connections (Outside Community)** | **Individual Connections (Any)** | **Panchayat Connections** |
| Health, Education, and Gov. Service Network Connections | 1.101 *** (0.018) | | | | |
| Indicator of Health Professional in *Bonding* Network | | 1.057 (0.041) | | | |
| Indicator of Education Professional in *Bonding* Network | | 1.071 ** (0.036) | | | |
| Indicator of Gov. Service Professional in *Bonding* Network | | 1.230 *** (0.049) | | | |
| Indicator of Health Professional in *Bridging* Network | | | 1.031 (0.038) | | |
| Indicator of Education Professional in *Bridging* Network | | | 1.080 ** (0.037) | | |
| Indicator of Gov. Service Professional in *Bridging* Network | | | 1.070 * (0.043) | | |
| Indicator of Health Professional in Either Network | | | | 1.019 (0.035) | |
| Indicator of Education Professional in Either Network | | | | 1.119 *** (0.037) | |
| Indicator of Gov. Service Professional in Either Network | | | | 1.184 *** (0.043) | |
| Indicator of Panchayat Member in Household | | | | | 1.132 (0.138) |
| Indicator of Panchayat Member Close to Household | | | | | 1.077 * (0.045) |
| Asset Index | 1.149 *** (0.005) | 1.150 *** (0.005) | 1.153 *** (0.005) | 1.149 *** (0.005) | 1.156 *** (0.005) |
| Highest Years of Education Attained by Adult in Household | 1.018 *** (0.003) | 1.018 *** (0.003) | 1.019 *** (0.003) | 1.017 *** (0.003) | 1.020 *** (0.003) |
| Indicator of Land Ownership | 1.431 *** (0.047) | 1.422 *** (0.047) | 1.442 *** (0.047) | 1.430 *** (0.047) | 1.444 *** (0.047) |
| Observations | 40,484 | 40,542 | 40,478 | 40,484 | 39,429 |
| Region, District, and Year FE | YES | YES | YES | YES | YES |
| Additional Controls | YES | YES | YES | YES | YES |
| Pseudo R-squared | 0.152 | 0.151 | 0.151 | 0.152 | 0.151 |
| Log Likelihood | −23,161 | −23,203 | −23,177 | −23,156 | −22,542 |

Note: Clustered (village-level) standard-errors in parentheses; * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

#### 4.4.1. Organizational Memberships

Members of any formal community organization have 18% higher odds of viewing their own economic situation as better off compared to seven or ten years ago. This effect is significantly larger than the marginal change in odds associated with a one-unit increase in a household's asset index (15.3% greater odds) and over nine times greater in magnitude than the effect of an additional year of educational attainment (1.9%). Interestingly, membership in a bridging organization is associated with significantly higher odds of a positive response (18%) than membership in a bonding organization (16.3%). Relative to membership in a Mahila mandal, membership in a development group is associated with 44.1% greater odds of perceiving improved economic circumstances, a magnitude equivalent to the effect of land ownership.

#### 4.4.2. Social Networks

An additional person of influence in a household's social network is expected to increase the odds of a positive response by 10%. As for industry-specific indicators, the indicator for relationships with health professionals is not statistically significant, but households with a close connection to a government service professional have 18% higher odds of having perceived improved economic conditions. Having a close relationship with a panchayat member is associated with 7.7% greater odds of responding "better off", an effect nearly four times that associated with an additional year of schooling for a household's highest-educated adult. As in the organizational membership models, a one-unit increase in a household's asset index is related to about 15% higher odds of viewing one's economic situation as having improved.

### *4.5. Theoretical Mechanism*

Social capital has clear value in enhancing households' consumption, asset ownership, likelihood of living above the poverty line, and perception of positive change in economic circumstances. As a final empirical exercise, this paper examines four specific channels through which social capital drives these economic outcomes; these results are reported in Tables 9–13.

**Table 9.** Logistic regression estimates: effects of select social capital variables on access to credit.

| **Dependent Variable: Indicator of Receiving Loan from NGO or CCG** | **Loan Source: Any [1]** | | | **Loan Source: NGO or Community Credit Group [2]** | | |
|---|---|---|---|---|---|---|
| | **Indicator of Membership** | **Total Memberships** | **Organization Type** | **Indicator of Membership** | **Total Memberships** | **Organization Type** |
| Membership in Any Formal Organization | 62.6% *** | | | 167% *** | | |
| Total Memberships Affiliated to Household | | 18.4% *** | | | 28.6% *** | |
| Memberships in Any Bonding Organization | | | 13.1% ** | | | −11.0% |
| Membership in Any Bridging Organization | | | 66.7% *** | | | 236% *** |
| Log of Monthly Per Capita Consumption Expenditures | 44.9% *** | 45.1% *** | 46.1% *** | −4.60% | −4.50% | −2.50% |
| Indicator of Land Ownership | 44.2% *** | 44.0% *** | 47.6% *** | 14.5% | 14.3% | 22.4% * |
| Highest Years of Education Attained by Adult in Household | 1.10% *** | 1.20% *** | 1.20% *** | 4.00% | 6.00% | 5.00% |
| Observations | 41,155 | 41,110 | 40,075 | 31,174 | 31,136 | 30,326 |
| Pseudo R-squared | 0.171 | 0.169 | 0.173 | 0.101 | 0.100 | 0.113 |

Note: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$ [1] Loan source options in the IHDS survey were as follows: employer, money lender, friend, relative, bank, NGO, community credit group, government program, and other. [2] This narrower definition of the dependent variable borrows from Langer (2009).

**Table 10.** Logistic regression estimates: effects of select social capital variables on male and female access to any information source.

| Dependent Variable: Indicator of Regular Access to Any Information Source | Male | | | Female | | |
|---|---|---|---|---|---|---|
| | Indicator of Membership | Total Memberships | Total Network Connections | Indicator of Membership | Total Memberships | Total Network Connections |
| Membership in Any Formal Organization | 18.1% *** | | | 23.4% *** | | |
| Total Memberships Affiliated to Household | | 4.80% *** | | | 7.80% *** | |
| Total Health, Education, and Gov. Service Connections | | | 21.1% *** | | | 20.2% *** |
| Log of Monthly Per Capita Consumption Expenditures | 84.5% *** | 85.0% *** | 75.8% *** | 89.2% *** | 89.3% *** | 82.0% *** |
| Highest Years of Education Attained by Adult in Household | 13.7% *** | 13.7% *** | 12.9% *** | 13.3% *** | 13.3% *** | 12.6% *** |
| Observations | 39,275 | 39,232 | 38,971 | 40,101 | 40,057 | 39,798 |
| Pseudo R-squared | 0.219 | 0.218 | 0.223 | 0.248 | 0.248 | 0.251 |

Note: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

**Table 11.** Logistic regression estimates: effects of select social capital variables on male and female access to newspapers.

| Independent Variables | Male Dependent Variable: Indicator of Regular Access to Newspapers | | | Female Dependent Variable: Indicator of Regular Access to Newspapers | | |
|---|---|---|---|---|---|---|
| Membership in Any Formal Organization | 36.7% *** | | | 42.9% *** | | |
| Total Memberships Affiliated to Household | | 13.0% *** | | | 12.3% *** | |
| Total Health, Education, and Gov. Service Connections | | | 33.6% *** | | | 32.4% *** |
| Log of Monthly Per Capita Consumption Expenditures | 122% *** | 121% *** | 106% *** | 89.2% *** | 89.3% *** | 82.0% *** |
| Highest Years of Education Attained by Adult in HH | −23% *** | −23% *** | −21% *** | −20% *** | −20% *** | −19% *** |
| Observations | 36,932 | 36,890 | 36,654 | 36,586 | 36,543 | 36,205 |
| Pseudo R-squared | 0.331 | 0.332 | 0.337 | 0.348 | 0.347 | 0.352 |

Note: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

**Table 12.** Logistic regression estimates: effects of formal group membership on confidence in public institutions.

| Independent Variables | Dependent Variable: Binary Indicator of "A Great Deal" of Confidence in ... | | | | |
|---|---|---|---|---|---|
| | Panchayat | State Government | News Media | Government Schools | Government Hospitals |
| Membership in Any Formal Organization | 11.3% *** | 12.9% *** | 11.4% *** | 17.9% *** | 14.5 *** |
| Log of Monthly Per Capita Consumption Expenditures | 10.1% *** | 5.70% ** | 7.50% *** | 2.30% | −5.70% ** |
| Highest Years of Education Attained by Adult in Household | −0.20% | −0.50% * | 0.50% * | −0.60 ** | −0.50 ** |
| Observations | 40,854 | 40,774 | 39,249 | 40,926 | 41,000 |
| Pseudo R-squared | 0.075 | 0.070 | 0.060 | 0.079 | 0.077 |

Note: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

**Table 13.** Logistic regression estimates: effects of village-level social capital on interpersonal conflict level in village.

| Independent Variables | Dependent Variable: Indicator of Perception of "Not Much" Conflict in Village |
|---|---|
| Binary Indicator of Village's Cooperative Problem-Solving Tendencies | 61.2% *** |
| Village Average Rate of Participation in Formal Community Organizations | 51.3% ** |
| Village Average Total Confidence in Public Institutions | 12.7% *** |
| Village Average Logged Per Capita Consumption Expenditures | −27.6 ** |
| Observations | 36,444 |
| Pseudo R-squared | 0.145 |

Note: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Access to credit has been identified as a potential pathway for social capital to expand economic opportunities (Deng et al. 2019; Liu et al. 2020; Li et al. 2022; Li and Hua 2023). This study finds strong support (Table 9) for this mechanism's efficacy among rural Indian households—members of local organizations have 63% higher odds of receiving a loan from any formal or informal source and 1.5 greater odds of being a loan recipient from an NGO or community credit group. Additionally, this study finds support for social capital's role as a facilitator of information flow to rural households (Table 10). Specifically, membership in community associations is associated with higher odds that a household's members regularly consume information via newspapers—37% for men in the household and 43% for women (Table 11). Addressing the interplay between community associations and local institutions, a critical nexus in social capital theory, this study finds that membership in local organizations is associated with a substantially higher likelihood of households expressing strong confidence in their village panchayat, state government, news media, and government schools and hospitals (Table 12). Finally, this study finds that village-level social capital indicators are positively associated with meaningfully higher odds that a household lives in a community with low levels of interpersonal conflict (Table 13).

## 5. Discussion

Social capital has found a prominent place in economic development literature over the past decades, and deservedly so. Interpersonal relationships are so integral to human nature that they are often taken for granted, but sociological scholarship, economic theory, and empirical studies all indicate that relationships are valuable productive assets. Engbers et al. (2017b) have argued that the term "social capital" has undergone theoretical diffusion, becoming both "more narrowly- and broadly-focused" than its early sense. To avoid theoretical diffusion of the term, this paper employs organizational memberships as a measure of household social capital. Additionally, this paper studies social capital through structural considerations such as trust in local and state governments, police, and judiciary bodies. This allows the study to additionally focus not only on individuals and their interpersonal connections, but also on the institutions that are critical to building and strengthening social capital.

Leveraging this strong theoretical background and the inimitable scope and scale of the India Human Development Survey, this paper examines the household-level economic impacts of the most granular dimensions of bonding and bridging social capital. Results indicate that households that are members of any formal community organization are expected to have 9.6% higher monthly per capita consumption expenditures than households without involvement in any such associations. The paper also finds that an additional health, education, or government service professional in a household's social network is associated with 8.9% higher consumption expenditures. These effect magnitudes are roughly comparable to the returns associated with a five-year increase in educational attainment for a household's highest educated adult and household ownership of land. Social relationships, both those that have been institutionalized by formal organizations

and those that exist in networks of proximity to influential persons, provide rural Indian households with tangible, productive returns.

Examining specific channels through which social capital might impact household welfare, this paper finds that members of local organizations have higher odds of receiving access to credit through formal or informal sources, suggesting the importance of ongoing development work at the intersection of local associations and lending practices in rural communities. Additionally, social capital facilitates information flow to rural households, and also increases the likelihood that members report higher levels of confidence in institutions of local governance, police, news media, hospitals, and schools. Finally, increased membership and participation in village-level organizations is associated with higher odds that a household lives in a community with low levels of interpersonal conflict. These results may provide actionable insights to development specialists interested in identifying characteristics of communities that may be especially conducive to public program implementation.

Social capital, understood as the shared values, mutual trust, and social networks that give cohesion to a society and foster cooperation, is inherently important for individual life satisfaction, not just for household economies. In its World Development Report of 2003, the World Bank states that social capital ("interpersonal networks, shared values, and trust") is complementary to the accumulation and productivity of environmental assets, human capital, and physical capital (World Bank 2002, p. 19). Social capital enhances information flow, reduces transaction costs in economic decisions, and helps foster more effective institutions, all of which play a role in driving development outcomes (Engbers and Rubin 2018)

Social capital has been found to positively impact political accountability (Nannicini et al. 2013), longevity and labor productivity (Alpaslan and Burchell 2022), financial development (Guiso et al. 2004), regional innovation (Kobeissi et al. 2023; Oh and Yoon 2021), and GDP per capita and GDP growth (Tabellini 2010). These results are especially strong in areas with weak legal enforcement and low educational attainment (Guiso et al. 2004). To the extent that social capital in the form of horizontal network connections build and reinforce trust and civic cooperation (Putnam et al. 1993b; Knack and Keefer 1997) and positively impact upward income mobility (Lancee 2010; Chetty et al. 2022a), policies to support institutions aimed at building and strengthening social networks in developing countries should be welcomed (Hörisch and Obert 2020).

This paper's findings reflect the complementarity between social capital and both human and human-made assets. Social capital is a catalyst for increasing household welfare along multiple dimensions, and, therefore, a critical area of focus for economists, sociologists, development practitioners, and policymakers. Crucially, while institutional reforms (particularly to build well-developed financial sectors offering secure property rights, formal access to credit, and reliable contract enforcement) may be necessary for economic growth and development (Knack and Keefer 1997), they may not be sufficient; in the pursuit of growth and development, good social institutions are a necessary complement to good political and economic institutions (Greif and Iyigun 2013).

Some important tasks lie ahead. First, the "dark side of social capital" (Putzel 1997; Portes 1998) deserves serious consideration. In a systematic review of the literature on health effects of social capital, Villalonga-Olives and Kawachi (2017) identify social contagion of unhealthy behavior as a dark side of social capital, particularly for youth where the behavioral-social contagion operates via peer pressure. Systematic studies are needed to identify which forms of social capital are needed for particular outcomes; for example, which forms of bridging or bonding social capital matter for health choices or for building good democratic institutions.

Second, an important area of research is in investigating the channels through which social capital accumulates or weakens. Some policies to encourage interconnectedness through the formation of and participation in groups may produce short-term benefits but undermine social capital with "negative long-term effects" (Guiso et al. 2011). In light of

the positive impacts of social capital on upward income mobility, a better understanding of economic connectedness is needed to devise policies that can increase intergenerational income mobility. Chetty et al. (2022b) provide a detailed examination of the determinants of economic connectedness in the United States. Analogous studies for developing countries will help design context-dependent policies to foster and strengthen social capital.

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## Appendix A

### *Appendix A.1 Theoretical Model*

Becker (1974) defines a household production function with utility-generating commodities produced as a function of market goods, variables representing the economic environment of the household, and a household's social capital: $Z_j = f_j^i\left(x_j, t_j, E^i, R_j^1, \ldots, R_j^r\right)$, where $Z_j$ indicates unique commodity $j$. Each commodity is produced by the household using a vector of market goods, $x_i$, and a vector of quantities of its time, $t_i$. This production is also a function of $E$, a vector of variables that represents the economic environment—household-specific characteristics such as education—in which the production takes place. $R_j^1, \ldots, R_j^r$ are characteristics of other persons that affect the household's production of commodities. Becker argues that this influence of others on a household's production is significant in most cases and further reasons that it is incorrect to treat $R_j$ as completely exogenous. Rather, household $i$ can change $R_j$ in part by its own efforts, while some variables affecting $R_j$ remain outside its control.

Assuming that a single commodity is produced with a single market good and a single characteristic of others (ignoring time as an input), Becker notes that maximizing utility is equivalent to maximizing the output of the commodity and is given as $U_i = Z(x, E, R)$, with R defined as $R = D_i + h$, where $h$ is the effect of household $i$'s efforts and $D_i$ is the level of $R$ when $i$ makes no effort. $D_i$ therefore measures $i$'s "social environment". The household is subject to a budget constraint on money income: $p_x x + p_R h = I_i$, where $p_r h$ is the amount that it spends on $R$ and $p_r$ is the price to the household of a unit of $R$. Substituting $R - D_i$ for $h$ in the budget constraint yields the following budget constraint: $p_x x + p_R R = I_i + p_R D_i = S_i$. The right-hand side is the sum of the household's money income and the value to it of its social environment—equal to $S_i$, or its social income. The left-hand side shows how its social income is spent: partly on market goods $(x)$ and partly

on the characteristics of others $(R)$. A household maximizes utility subject to the constraint on its social income when the ratio of the marginal utilities of $x$ and $R$ is equal to the ratio of the prices of $x$ and $R$.

To formalize the above household production model with social interactions, consider a model in which a household's utility is derived from its production of commodities. Let $X$ represent all market goods and services the household uses in its production of all utility-generating commodities $(Z_1 \dots Z_n)$. Let $E$ denote all environmental variables that contextualize the economic environment in which the production takes place and let $R$ capture all characteristics of other persons $(R_1 \dots R_r)$ that affect the household's production of commodities. The household's utility function is thus given as $U_H = Z(X, E, R)$, where $R$ is the household's social capital. The household faces a budget constraint on its social income: $p_X X + p_E E + p_R R = S_H$. Here $E$ refers in large part to education and experience as environmental factors, two variables explicitly mentioned by Becker (1974). Thus, $p_E$ is the price to the household of obtaining such production-enhancing skills and knowledge (in other words, human capital investment).

With a constant elasticity of substitution, solving the constrained utility maximization problem above gives three demand functions, for $h$, $X$, and $E$:

$$h(p_X, p_E, p_R, S_H, D_H) = \left( \frac{{p_R}^{1/(\delta-1)}}{{p_X}^{\delta/(\delta-1)} + {p_E}^{\delta/(\delta-1)} + {p_R}^{\delta/(\delta-1)}} S_H \right) - D_H,$$
$$X(p_X, p_E, p_R, S_H) = \frac{{p_X}^{1/(\delta-1)}}{{p_X}^{\delta/(\delta-1)} + {p_E}^{\delta/(\delta-1)} + {p_R}^{\delta/(\delta-1)}} S_H,$$
$$E(p_X, p_E, p_R, S_H) = \frac{{p_E}^{1/(\delta-1)}}{{p_X}^{\delta/(\delta-1)} + {p_E}^{\delta/(\delta-1)} + {p_R}^{\delta/(\delta-1)}} S_H.$$

The first expression represents the household's demand for production-enhancing, self-induced interactions with others as a function of the price of market goods and services, the price of acquiring units of various environmental variables, the price of obtaining an additional unit of social capital, its level of social income, its social environment, and the substitution parameter. By the same process, the household's demand for $X$ and $E$ can be expressed in similar terms, as in the second and third expressions, respectively.

Just as the household's demand for $R$ can be expressed in terms of $h$—the agent-driven component of social capital—its demand for $E$ can also be reframed in a manner that more accurately focuses the analysis on household choice. In fact, Becker notes that every term in the household's utility function has both an environmental and an acquired component, though he ignores a household's nonsocial environment in his analysis for simplicity. Becker provides two examples of the validity of this approach for environmental variables: (1) human capital is both inherited and acquired through investments, and (2) a household's atmospheric climate is determined both by the weather and by expenditures on temperature controls. Generally, $E$ can be expressed in a form identical to $R$ that accounts for both the acquired or exogenous components of all environmental variables relevant to household production and the aspects of these variables that a household can affect through its own efforts and investments, $E = G_H + k$, where $G_H$ is the acquired or external component and k is the effect of the household's own efforts. The demand for $E$ may now be expressed as:

$$k(p_X, p_E, p_R, S_H, G_H) = \left( \frac{{p_E}^{1/(\delta-1)}}{{p_X}^{\delta/(\delta-1)} + {p_E}^{\delta/(\delta-1)} + {p_R}^{\delta/(\delta-1)}} S_H \right) - G_H.$$

The model now yields a full explanation of a utility-maximizing household's behavior whose production reflects the influence of the product market, the household environment,

and its social environment. Comparative statics for the three demand functions are given as:

$$X\left(\overbrace{p_x}^{-}, \overbrace{p_E}^{+}, \overbrace{p_R}^{+}, \overbrace{S_H}^{+}\right) = \frac{{p_X}^{1/(\delta-1)}}{{p_X}^{\delta/(\delta-1)}+{p_E}^{\delta/(\delta-1)}+{p_R}^{\delta/(\delta-1)}} S_H,$$

$$k\left(\overbrace{p_x}^{+}, \overbrace{p_E}^{-}, \overbrace{p_R}^{+}, \overbrace{S_H}^{+}, \overbrace{G_H}^{-}\right) = \left(\frac{{p_E}^{1/(\delta-1)}}{{p_X}^{\delta/(\delta-1)}+{p_E}^{\delta/(\delta-1)}+{p_R}^{\delta/(\delta-1)}} S_H\right) - G_H,$$

$$h\left(\overbrace{p_x}^{+}, \overbrace{p_E}^{+}, \overbrace{p_R}^{-}, \overbrace{S_H}^{+}, \overbrace{D_H}^{-}\right) = \left(\frac{{p_R}^{1/(\delta-1)}}{{p_X}^{\delta/(\delta-1)}+{p_E}^{\delta/(\delta-1)}+{p_R}^{\delta/(\delta-1)}} S_H\right) - D_H.$$

*Appendix A.2 Implications of the Theoretical Model*

Becker's theory establishes several powerful inferences for studies of social capital and human development. As consumer theory predicts, a household is expected to increase its demand for market goods and services when the price of such entities decreases or when its level of social income increases. When the price of acquiring an additional unit of human capital or another environmental variable increases, market expenditures are expected to increase, with the magnitude of the increase dependent on the degree of substitutability between the two household production inputs. The same is the case for an increase in the price of an additional unit of social capital. What is meant by the price of social capital? Becker asserts that prices are a measure of scarcity, not any intrinsic material value, and therefore the price of social capital simply measures the resource cost to the household of pursuing social interactions. In other words, the price of social capital refers to the time or opportunity costs of socialization, group membership, and networking, as well as any financial costs associated with such activities.

Expenditures on environmental variables are expected to increase when the household faces a lower cost of human capital investment. When the price of either market consumption or social capital increases, efforts to augment environmental factors are anticipated to be higher. A higher level of social income is also predicted to raise such expenditures, though a higher level of acquired environmental variables is associated with decreased efforts to augment the household's existing stock. For example, consider a household in a developing country engaged in the production of a subsistence crop who, through no effort of their own, live in a temperate climate and whose members have inherited a comprehensive knowledge of the production process from previous generations. These are all (nonsocial) environmental variables that describe the economic environment in which production takes place. In the parlance of the model, this household's level of $G_H$ is very high, and it has little incentive to invest time or money in any $k$ efforts, such as training and education for the household's farmers or implementing climate control mechanisms for the crop.

Efforts put toward social engagements are expected to increase when the cost of such activities to the household is lower and when market consumption or environmental adjustments are more expensive. Investment in social capital, like the other production inputs, is expected to rise when the household's level of social income rises. The household's efforts to increase its social capital are expected to decrease with a higher production-enhancing level of its external social environment. Social capital investments are expected to increase with a lower level of a household's external social environment, as well as in any circumstance in which a household's acquired social atmosphere is actually detrimental to its production.

This is an important implication of the model and, as social capital is ultimately the focus of this analysis, it is worthwhile to build out the external social environment, $D_H$, to further contextualize the social environment that factors into a household's consumption and production decisions. Drawing on common themes from the social capital literature, a household's general "social environment" (independent of its own efforts) can be written

as a function of broad subsets. This paper borrows from Cvetanovic et al. (2015), who provide a categorized breakdown of social capital that can be considered both exclusive and exhaustive. A household's social environment can be broken down into three components: (1) structural: consists of various networks, associations, and institutions, as well as the rules and procedures they establish, (2) relational: indicates the quality of connectedness, and (3): cognitive: consists of attitudes and behavioral norms, shared values, trust, and reciprocity (Cvetanovic et al. 2015). Thus, the demand function for $h$ may be rewritten as:

$$h\left(\overbrace{p_x}^{+}, \overbrace{p_E}^{+}, \overbrace{p_R}^{-}, \overbrace{S_H}^{+}, \overbrace{D_H}^{-}\right) = \left(\frac{{p_R}^{1/(\delta-1)}}{{p_X}^{\delta/(\delta-1)} + {p_E}^{\delta/(\delta-1)} + {p_R}^{\delta/(\delta-1)}} S_H\right) - D_H(ST, RE, CO),$$

where $ST$, $RE$, and $CO$ represent the structural, relational, and cognitive components of a household's social environment, respectively.

In an exercise similar to the one used to describe acquired environmental variables, consider a household that, through no result of its own efforts, dwells in a village that has highly effective local and regional institutions (structural social capital), a high degree of inter-connectedness and interpersonal trust (relational social capital), and well-established behavioral norms (cognitive social capital). Such a household would find less of a reason to spend time or money advocating for institutional change or attempting to increase trust or reciprocity through social activities—its stock of $R$ is already quite high by virtue of the existing external environment, $D_H$. Likewise, a household whose community has ineffective courts and police, lacks norms of trust and reciprocity, and is therefore crime-ridden and may be more likely to spend time or resources engaging with democratic processes or formal community organizations ("doing" $h$) to offset the production-dampening impact of its social environment, $D_H$.

The careful development of this theoretical model places a household's stock of social capital as an integral factor in its production of utility-generating commodities. The model explicitly validates the concept that social capital—represented by both a household's own efforts to forge interpersonal relationships and the external determinants of a household's larger social environment—serves a prominent role alongside human capital and tangible productive assets in influencing household welfare. The empirical exercise in this paper substantiates this idea using variables that measure household welfare, tangible assets, relevant environmental factors, and other characteristics. Examining the relationships between these variables reveals insights regarding the effects of social capital on household welfare and the relative magnitude of its impact compared to the theoretical "substitutes" described in this theoretical model.

*Appendix A.3 Household Welfare Variables*

An index of household physical assets is constructed from the IHDS' set of dichotomous questions regarding ownership of 30 distinct consumer goods and housing provisions, ranging from an air conditioner to a telephone to a pucca roof. The average household owns just over 10 of the 30 physical assets, and Figure A1 illustrates the distribution. The physical asset data is right-skewed due to certain expensive items included in the scale, so a logarithmic transformation of the asset index is also calculated for empirical modeling. We use $ln(AssetIndex + 1)$ since some observations take on the value of zero (Vanneman et al. 2006).

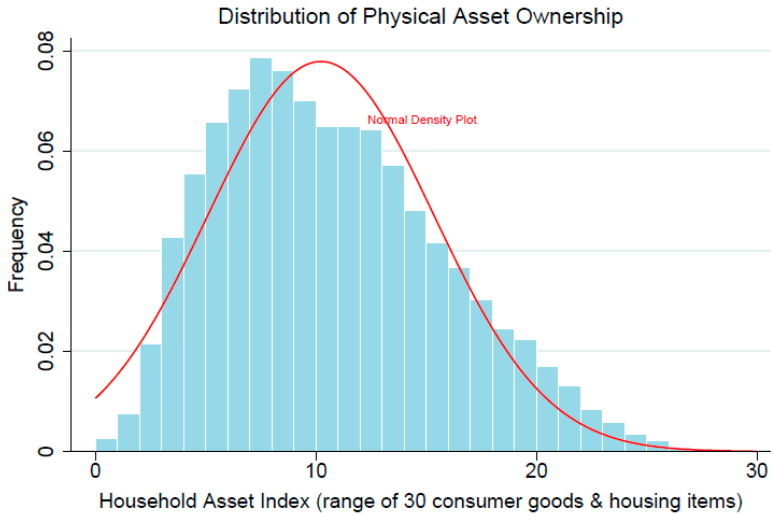


**Figure A1.** Distribution of physical asset ownership.

Monthly consumption expenditures in the IHDS are estimated from a series of 50 survey questions about expenditures on individual items. All consumption expenditures are transformed to the real value of the rupee in 2012. Expenditures from the IHDS-I sample are scaled upward by the following (data from St. Louis Fed):

$$EXP_{2012} = EXP_{2005} \times \frac{CPI_{2012} = 80.07}{CPI_{2005} = 44.44}$$

Table A1 lists the distribution of consumption expenditures in Indian rupees. Unsurprisingly, the data are highly right-skewed and are therefore operationalized in logged form. Figure A2 presents the logged distribution and Figure A3 the sample's Lorenz Curve, which shows a sizable degree of inequality in household consumption.

**Table A1.** Per capita monthly household consumption expenditures.

| Percentile | Expenditure (₹) |
|---|---|
| 1st | 294 |
| 10th | 562 |
| 25th | 803 |
| 50th | 1207 |
| 75th | 1907 |
| 90th | 3063 |
| 99th | 8400 |

The IHDS calculates household poverty based on the estimates of monthly consumption per capita. A total of 20.4% of households in the sample are below the poverty line, which is set by official government parameters and varies by state and residential context. The percentage of households in poverty was significantly lower in 2012 than in 2005 by about two percentage points.

The IHDS question "Compared to [X] years ago, would you say your household is economically doing the same, better or worse today?" provides a subjective, agent-based measure of household welfare (The question was asked relative to 7 years ago in the 2012 survey and relative to 10 years ago in the 2005 wave.). In 2011–2012, 35.5% of households said that their economic situation had improved relative to their 2004–2005 survey, while 10.5% responded that it had worsened. In 2005, 45.1% of households responded positively and 15.3% responded negatively relative to 1995. Subjective assessments of household welfare are far less common in the social capital literature, though this measure provides useful insights given that it allows the household to define its "economic situation" however

it wants, rather than restricting the identification to a monetary proxy. In fact, the pairwise correlation between positive responses to this survey question and logged per capita consumption expenditures in the sample is quite low (r = 0.17).

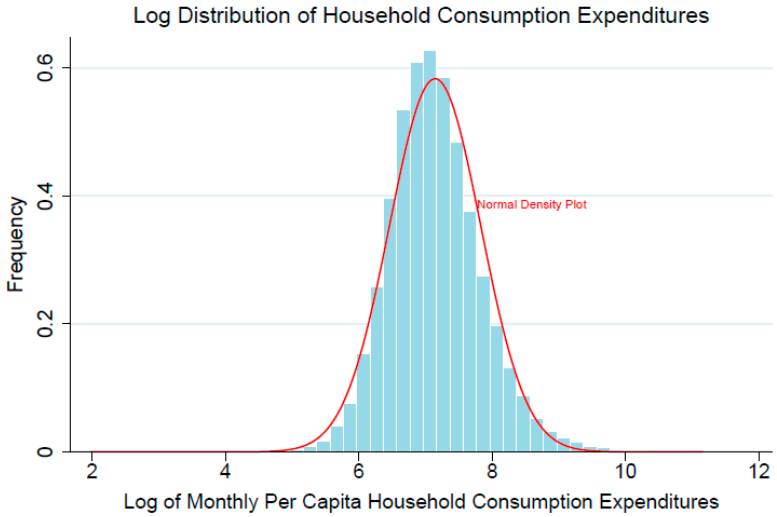


**Figure A2.** Log distribution of household consumption expenditures.

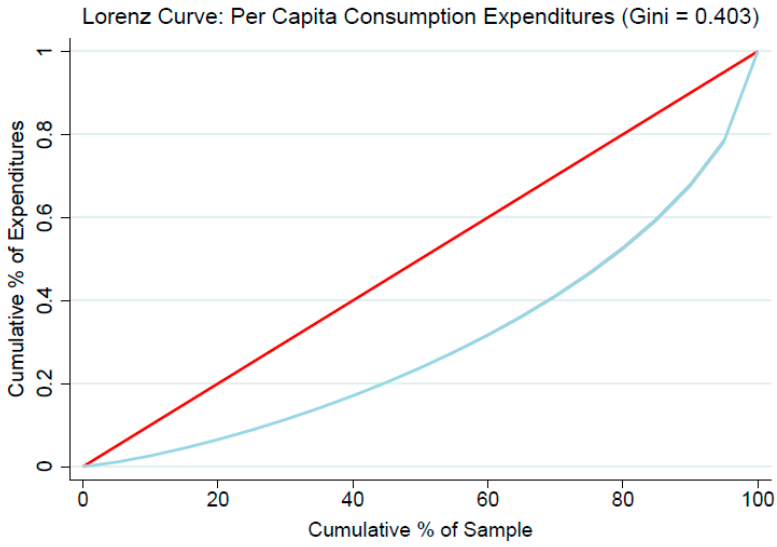


**Figure A3.** Lorenz Curve: per capita consumption expenditure (Gini = 0.403).

*Appendix A.4 Social Capital Variables*

Group Membership: The 10 community groups included in the survey are: Mahila mandal, youth club/sports group/reading room, union/business/professional group, self-help group, credit/savings group, religious group/social group/festival society, caste association, development group/NGO, and agricultural/milk/other cooperative. A total of 39% of households are members of at least one such group, with the average household belonging to 0.76 groups. Self-help groups—village-based saving and lending cooperatives—are the most prevalent organizational category in the sample, with 16.3% of households claiming membership. A total of 14% of households are members of religious, social, or festival groups. Household participation in such associations is limited by the number of formal groups existing in each village. The typical village in the sample is home to 3.4 of these organizations. On average, households are members of 25% of the existing groups in their village. Several of the community associations in the IHDS surveys can be classified as facilitating either "bridging" or "bonding" social capital. Bonding groups

include religious/social/festival groups and caste associations, while self-help groups, credit/savings groups, and development groups are defined as bridging organizations (Story 2014; Story and Carpiano 2017). A total of 22% of households are members of at least one bridging group and 18% are members of at least one bonding group. In addition to formal organizational ties, the IHDS data supplies information on civic participation; 36% of households reported that they had attended a public meeting called by their village panchayat within the year leading up to their survey.

With regard to interpersonal relationships, the IHDS asked households a series of questions pertaining to interpersonal interactions within their villages. Only 6.1% of households reported experiencing theft, break-in, or an attack or threat in the year prior to their interview. A total of 67% of sample respondents said that households in their village bonded together to solve community problems, rather than having each family solving their problems individually. The IHDS surveys also provide a wealth of data on households' proximity to influential persons in their social networks. Table A2 provides the percentage of households with connections to professionals in the health, education, and government service fields. The average household has 1.2 personal connections across the health, education, and government service spheres. Additionally, 3.6% have a panchayat member in the household, and 20.6% of households reported having a close relationship with a panchayat official outside of the household.

**Table A2.** Social networks: household connections to influential persons.

| Profession | Any Connection | Within Community | Outside Community |
|---|---|---|---|
| Health | 41.5% | 17.1% | 32.3% |
| Education | 48.3% | 26.9% | 34.2% |
| Government Service | 28.0% | 16.5% | 16.4% |

With regard to institutional confidence, the IHDS provides rich information on households' confidence in a variety of local and regional institutions. Respondents were asked, on a three-unit scale, if they had (1) a great deal, (2) only some, or (3) hardly any confidence in ten institutional structures and figures that make up a household's external economic and social environment. The ten institutional structures and figures are: politicians, military, police, state government, newspapers/news media, village panchayat, government schools, government hospitals, courts, and banks. This study operationalizes these attitudes across all institutions in a single measure of aggregate total confidence. This scale ranges from 0 to 20, with 0 indicating hardly any confidence on average, 10 marking some overall confidence, and 20 signaling a great deal of confidence in every institution. The median of this measure is 15, and the middle 80% of values are clustered between nine and eighteen.

With regard to access to information, the IHDS surveys include detailed information on households' access to various information channels. Exposure to mass media—a dimension of households' social connectivity—is recorded by how often both men and women in the household listen to the radio, read newspapers, and watch TV. On average, 41% of men and 43% of women in households have regular access to at least one of these sources. Table A3 breaks down male and female rates of exposure to the three information channels.

**Table A3.** Regular access to information channels.

| Source | Male | Female |
|---|---|---|
| Radio | 9.1% | 7.0% |
| Newspaper | 12.6% | 6.1% |
| Television | 33.3% | 39.0% |

With regard to subjective self-assessment of welfare, the IHDS question "Compared to [X] years ago, would you say your household is economically doing the same, better or worse today?" provides a subjective measure of economic welfare. In IHDS-II, 35.5% of

households said that their economic situation had improved relative to their 2005 survey, while 10.5% responded that it had worsened. In 2005, 45.1% of households responded positively and 15.3% responded negatively. These benchmarks provide an alternative measure of household welfare and capture changes in outlook over time.

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