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THE SIZE OF THE MIDDLE CLASS AND EDUCATIONAL OUTCOMES: THEORY AND EVIDENCE FROM THE INDIAN SUBCONTINENT*

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Abstract

This paper proposes a stylised model to derive the effect of a sizeable middle class on average educational outcomes. Under reasonable assumptions, the model predicts that the spending share on education increases if the middle class becomes larger such that the size of the middle class has a positive impact on education. We test the relationship empirically by using village/neighbourhood level data from Indian household surveys. To tackle the issue of potential endogeneity of the middle class share of the population, we propose a novel instrument that relies on the fraction of the population belonging to the third (middle) caste ("sudra"). Using this IV strategy, our empirical results support a positive effect of a larger middle class on educational outcomes. Furthermore, we show that the share of the middle class is a more important determinant of female education than male education and that the effect of the middle class on education is more pronounced in rural areas.

Keywords: India, inequality, middle class, education, castes.
JEL-Classifications: I24, I25, I30, O15.

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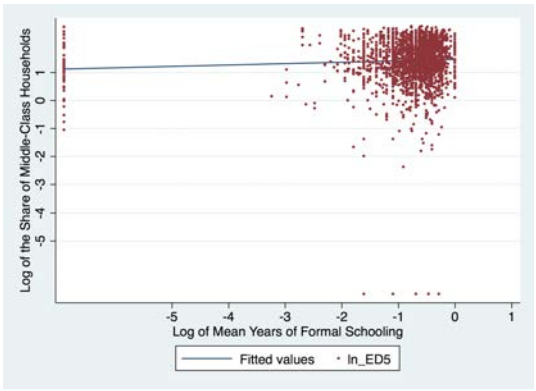
1 Introduction

The Industrial Revolution in Europe entailed an array of socio-political changes that transformed the basis of material wealth and political influence from landownership towards ingenuity and entrepreneurship. Representatives of this new kind of influential individuals predominantly belonged to the urban middle class. The formerly ruling class of landowners lost most of their influence both economically and politically (Doepke and Zilibotti, 2008; Galor et al., 2009). Doepke and Zilibotti (2008) stress that this fundamental change in the basis of wealth is largely attributable to differences in the preference structures across social classes. The constituents of the land-owning class are seen as exhibiting a poor work ethic, a low preference for saving, and inadequate entrepreneurial and innovative skills. By contrast, the members of the new affluent social class of industrialists are held to be diligent and exhibiting a more future-oriented preference structure.

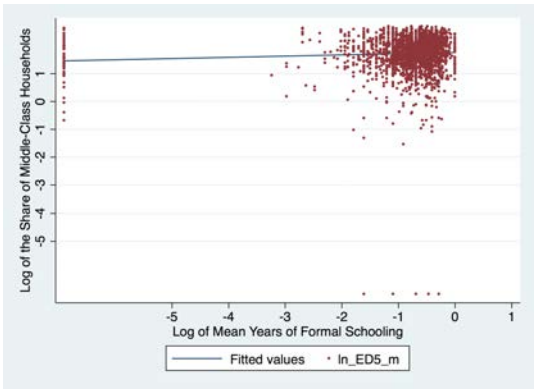
One channel by which differences in time preference rates exert an influence at the macroeconomic level is the savings behaviour of individuals. The more impatient individuals are, the less they save and the weaker is aggregate physical capital accumulation, one of the sources of growth over the medium run (Solow, 1956; Cass, 1965; Diamond, 1965; Koopmans, 1965). Another – probably even more important – channel is education, i.e., foregoing current consumption in favour of accumulating human capital, often of the subsequent generation (Galor and Weil, 2000; Galor, 2005, 2011). Since substantial educational investments are often made early in life, whereas the benefits of these investments accrue later or even to the next generation, societies with relatively large shares of middle class households that are relatively patient should exhibit a high level of average educational attainment.

There are many different pathways by which education exerts positive economic and social effects. Education raises the productivity of workers and has spillover effects in team production (Lucas, 1988); education fosters the creation of new ideas, in the historical context mostly by tinkerers and in modern times by means of targeted research and development of highly educated scientists (Romer, 1990; Strulik et al., 2013); and education has numerous beneficial effects on socio-economic development, for example, on institutions and on democratization (Barro, 1999; Glaeser et al., 2004). Especially in the context of a conflict-prone country such as India, higher levels of average education seem to have a pacifying effect on societies (see Ostby and Urdal, 2011, for an overview of numerous contributions supporting this finding). For example, Alesina and Perotti (1996) show that socio-political instability is significantly reduced by higher levels of education in a panel of 71 countries over the time-span from 1960 to 1985; Tadjoeddin and Murshed (2007) find an inverted U-shaped relationship between average years of education and social conflict in Indonesia; and in a panel-analysis of 125 countries over the years 1960 through 1999, Collier (2004) finds that higher levels of male educational attainment are associated with significantly lower levels of conflict risk. Given the many beneficial effects of education, it is therefore

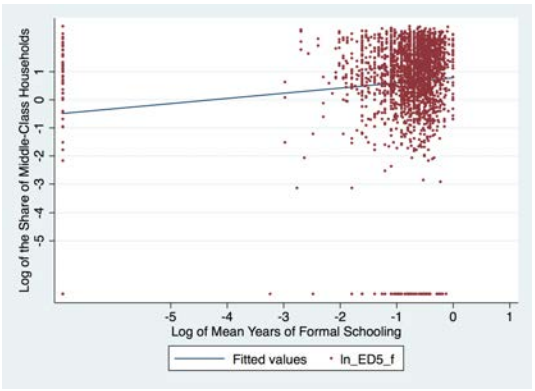
of utmost importance for less developed countries to understand its central determinants.



(a) Full Sample



(b) Male Sample



(c) Female Sample

Figure I. Cross-Sectional Plots of Educational Attainment versus Share of Middle-Class in Indian villages (2005).

As previous research has found support for the hypothesis that a larger share of the middle class fosters education and industrialisation in Europe, this channel should obviously not be ignored when assessing the evolution of developing countries towards modern, industrialised economies. As Figure I clearly shows, there exists a significantly positive correlation between middle class shares and average educational attainment in Indian villages. We see this as an indication that, especially in the context of educational attainment, the share of middle class households appears to play a similarly important role in developing economies in general – and India in a narrower sense – as it did in the Industrial Revolution in Europe.

In this contribution, we develop a stylised model of the demand for education in a society that is divided into three income strata. Households decide between the consumption of necessary goods, investments in the education of the subsequent generation, and spending on luxury goods. Since poorer households spend a substantial part of their income on subsistence needs, while richer households spend a non-negligible part of their income on luxury goods, the share of income that is spent on education tends to be the highest for members of the middle class. We show that in this setting, a higher proportion of middle class households in the society has the

potential to induce higher levels of average educational attainment.

In order to empirically test the impact of middle class shares on average educational attainment, we use Indian household survey data which entails detailed information about education, income, and caste membership. To start off our empirical assessment, we examine the cross-sectional conditional correlation between the share of middle class households and average educational attainment in Indian villages/neighbourhoods (henceforth: villages). While the results from the simple OLS estimations confirm a positive association between middle class shares and education, they do not allow us to make any statements about the direction of causality. The first reason is the potential presence of omitted variable bias. The second reason is that reverse causality might distort the OLS results. More explicitly, observational units that are characterised by higher levels of education might be fertile breeding grounds for middle class households. To overcome this problem, we expand our empirical analysis to the extent that we construct a novel instrument for the share of middle class households. Exploiting India's unique Hinduistic society, we use the share of members of the two castes that lie between the spiritual and intellectual elite of the Hinduistic society, the *Brahmans*, and the untouchable lowest caste, *Dalits* as an instrument for middle class shares per village. Applying this instrument, we find a positive and significant effect of middle class shares on average educational attainment. Furthermore, we show that the effect is especially pronounced in rural areas and when focussing on female education. The strong positive effect of the share of the middle class on the educational attainment of women is particularly interesting because there is widespread consent that the empowerment of women is highly effective in promoting economic development (Diebolt and Perrin, 2013; Prettner and Strulik, 2017; Bloom et al., 2017).

Our paper is structured as follows. Section 2 contains the theoretical motivation and derives the optimal investment of households in the education level of their children. In Section 3, we analyse the relation between education and the size of the middle class from an empirical point of view, and in Section 4 we draw our conclusions.

2 The Size of the Middle Class and Economic Growth: Theoretical Motivation

In the following, we provide a stylised theoretical consideration to motivate the empirical analysis of the potential impact of inequality in terms of the population share of the middle class on educational attainment.

2.1 Basic Assumptions

Consider a developing economy populated by households who have the possibility to consume three different types of goods: i) necessary goods such as food, clothing, and basic shelter without

which it is impossible to survive, ii) investments in the human capital of the next generation such as spending on education, and iii) luxury goods such as large housing, vacations abroad, expensive jewellery, etc., which might become desirable once that incomes are high enough and the basic needs are largely fulfilled. This structure implies a hierarchy of needs in the sense that households strive to fulfil their basic needs before they start to invest in education. The lowest priority is attached to luxury goods that households will only start to consume if their incomes surpass the threshold above which the diminishing marginal utility from spending on basic consumption goods and on education renders the consumption of luxury goods to be desirable.

2.2 Optimal Choices of the Households

We conceptualize the described hierarchy of needs by the following household utility function:

$$U(c_{s,t}, e_t, c_{l,t}) = \omega_s \log(c_{s,t} - \bar{c}_s) + \omega_h \log(h_t) + \omega_l \log(c_{l,t} + \bar{c}_l), \tag{1}$$

where $U(\cdot)$ is the utility level of the household, $c_{s,t}$ refers to consumption of basic goods at time t, h_t denotes expenditures on educating children, $c_{l,t}$ is consumption of luxury goods, ω_i for $i = s, h, l$ refers to the weights of the corresponding goods in the utility function with $\omega_s > \omega_e > \omega_l$, $\bar{c}_s$ denotes the subsistence consumption level of basic goods that is necessary for survival of period t, and $\log(\bar{c}_l)$ defines a lower bound on felicity derived from luxury goods for the case in which no income is spent on this item, i.e., $c_{l,t} = 0$. A reasonable assumption would be $\log(\bar{c}_l) = 0$ such that, without any spending on luxury goods, the utility derived from this component is zero. The short-cut formulation of altruism in this model is the well-known "warm-glow" motive of giving (Andreoni, 1989) that usually leads to qualitatively similar results as the more complicated formulation of a dynastic utility function. Note that we could also introduce other standard goods that do not belong to the basket of basic goods or luxury goods and would therefore exhibit a similar utility effect as h_t. However, this would merely complicate the exposition without changing the results and without adding new insights.

The budget constraint of a household implies that expenditures on the different types of consumption and on education must not exceed income. Formally, it is given by

$$w_t \geq c_{s,t} + h_t + p_{l,t} c_{l,t}, \tag{2}$$

where w_t is the income level of the household at time t, the price of the basic consumption goods ($c_{s,t}$) is normalized to unity, the price of education is measured in terms of foregone basic consumption, and the price of luxury goods ($c_{l,t}$) is given by $p_{l,t} > 1$. Note that, due to the local non-satiation implied by our utility function, the budget constraint will always hold with equality at any optimal allocation for $w_t > 0$. We can therefore solve the optimization problem by means of the method of Lagrange (see Appendix A for the derivations). From now on we

assume that the income level is high enough to guarantee that the subsistence consumption needs are fulfilled, i.e., $w_t > \bar{c}_s$ and people do not starve to death.

The set of optimal choices can be split into two parts depending on the level of household income (see Appendix A). For a high income level $w_t > p_{l,t}(\omega_h + \omega_s)\bar{c}_l/\omega_l + \bar{c}_s \equiv \hat{w}_t$, the demand functions are given by

$$c_{s,t} = \frac{\omega_s(w_t + p_{l,t}\bar{c}_l) + (\omega_h + \omega_l)\bar{c}_s}{\omega_s + \omega_h + \omega_l}, \tag{3}$$

$$h_t = \frac{\omega_h(w_t + p_{l,t}\bar{c}_l - \bar{c}_s)}{\omega_s + \omega_h + \omega_l}, \tag{4}$$

$$c_{l,t} = \frac{\omega_l(w_t - \bar{c}_s) - p_{l,t}(\omega_h + \omega_s)\bar{c}_l}{p_{l,t}(\omega_s + \omega_h + \omega_l)}, \tag{5}$$

which are all positive as long as $w_t > \hat{w}_t$. However, for $w_t \leq \hat{w}_t$, households find themselves in the corner solution at which the demand for luxury goods is zero and the other two demand functions are given by

$$c_{s,t} = \frac{\omega_s w_t + \omega_h \bar{c}_s}{\omega_s + \omega_h}, \tag{6}$$

$$h_t = \frac{\omega_h(w_t - \bar{c}_s)}{\omega_s + \omega_h}. \tag{7}$$

To summarize, we have the following set of (non-homothetic) demand functions for the whole range of allowed income levels $w_t > \bar{c}_s$

$$c_{s,t} = \begin{cases} \frac{\omega_s w_t + \omega_h \bar{c}_s}{\omega_s + \omega_h} & \text{for } \bar{c}_s < w_t < \hat{w}_t, \\ \frac{\omega_s(w_t + p_{l,t}\bar{c}_l) + (\omega_h + \omega_l)\bar{c}_s}{\omega_s + \omega_h + \omega_l} & \text{for } \hat{w}_t < w_t, \end{cases}$$

$$h_t = \begin{cases} \frac{\omega_h(w_t - \bar{c}_s)}{\omega_s + \omega_h} & \text{for } \bar{c}_s < w_t < \hat{w}_t, \\ \frac{\omega_h(w_t + p_{l,t}\bar{c}_l - \bar{c}_s)}{\omega_s + \omega_h + \omega_l} & \text{for } \hat{w}_t < w_t, \end{cases}$$

$$c_{l,t} = \begin{cases} 0 & \text{for } \bar{c}_s < w_t < \hat{w}_t, \\ \frac{\omega_l(w_t - \bar{c}_s) - p_{l,t}(\omega_h + \omega_s)\bar{c}_l}{p_{l,t}(\omega_s + \omega_h + \omega_l)} & \text{for } \hat{w}_t < w_t. \end{cases}$$

For a comparatively low income level, households spend most of their income on basic consumption goods and do not consume luxury goods at all. As incomes rise, the share of income spent on basic consumption goods decreases, while the share of income spent on education increases. Once that household income surpasses the level of $\hat{w}_t$, consumption of luxury goods becomes positive and the share of income spent on education of the children starts to decrease again.

2.3 The Income-Based Stratification of the Society

Now we assume that the society consists of three income groups i) the rich (indexed by r) with an income level of $w_{r,t} > \hat{w}_t$, ii) the middle class (indexed by m) with an income level of $w_{m,t} < w_{r,t}$,

and iii) the poor (indexed by p) with an income level of $w_{p,t} < w_{m,t}$. We normalize the total population size to unity and denote the share of the rich by θ_r and the share of the poor by θ_p such that the share of the middle class is given by $1 - \theta_r - \theta_p$. With these assumptions, the share of education expenditures in the economy determines the average human capital stock of the next generation as

$$\begin{aligned}\bar{h} &= \frac{\theta_p h_{p,t} + (1-\theta_p-\theta_r) h_{m,t} + \theta_r h_{r,t}}{\theta_p w_{p,t} + (1-\theta_p-\theta_r) w_{m,t} + \theta_r w_{r,t}} \\ &= \frac{\omega_e \left[\frac{\theta_r (p_l \bar{c}_l - \bar{c}_s + w_{r,t})}{\omega_e + \omega_l + \omega_s} + \frac{(1-\theta_p-\theta_r)(w_{m,t} - \bar{c}_s)}{\omega_e + \omega_s} + \frac{\theta_p (w_{p,t} - \bar{c}_s)}{\omega_e + \omega_s} \right]}{w_{m,t}(1-\theta_p-\theta_r) + \theta_p w_{p,t} + \theta_r w_{r,t}}. \end{aligned} \tag{8}$$

The appropriate interpretation of this expression is the following. The cost of education rises with the weighted average of the incomes in an economy which is reflected by the denominator. The reason is that education is labour-intensive such that the salaries of teachers, instructors, and professors rise with the average salary level of a country. Thus, a nominal increase in the expenditures of households on education does not necessarily lead to an increase in the human capital stock of the next generation because the increase could just compensate for a given increase in the nominal wages of teachers, instructors, and professors. What is needed to increase the average human capital stock of the next generation is an increase in the *share* of expenditures that are devoted to education.

It remains to be shown how the average human capital stock depends on the income-specific stratification of the society. To this end, we show how the average human capital stock depends on the population shares of the poor and the rich. Taking the derivatives of Equation (8) with respect to θ_r and θ_p yields

$$\frac{\partial \bar{h}}{\partial \theta_p} = \frac{(w_{m,t} - w_{p,t}) \left\{ \theta_r \left[p_l \bar{c}_l (\omega_e + \omega_s) - \omega_l w_{r,t} \right] - \bar{c}_s \left[\omega_e + \omega_l (1-\theta_r) + \omega_s \right] \right\}}{\omega_e^{-1} (\omega_e + \omega_s)(\omega_e + \omega_l + \omega_s) \left[w_{m,t}(1-\theta_p-\theta_r) + \theta_p w_{p,t} + \theta_r w_{r,t} \right]^2}, \tag{9}$$

$$\begin{aligned}\frac{\partial \bar{h}}{\partial \theta_r} = &\frac{\left[w_{m,t}(\theta_p - 1) - \theta_p w_{p,t} \right] \left[\omega_l w_{r,t} - p_l \bar{c}_l (\omega_e + \omega_s) \right]}{\omega_e^{-1} (\omega_e + \omega_s)(\omega_e + \omega_l + \omega_s) \left[w_{m,t}(1-\theta_p-\theta_r) + \theta_p w_{p,t} + \theta_r w_{r,t} \right]^2} \\ &+ \frac{\bar{c}_s \left[w_{r,t}(\omega_e + \omega_l + \omega_s) - w_{m,t}(\omega_e + \omega_l \theta_p + \omega_s) + \omega_l \theta_p w_{p,t} \right]}{\omega_e^{-1} (\omega_e + \omega_s)(\omega_e + \omega_l + \omega_s) \left[w_{m,t}(1-\theta_p-\theta_r) + \theta_p w_{p,t} + \theta_r w_{r,t} \right]^2}. \end{aligned} \tag{10}$$

Inspecting Equation (10), we observe that i) the common denominator of the terms in both lines is always positive; ii) the numerator of the term in the second line is always positive because $w_{m,t}(\omega_e + \omega_l \theta_p + \omega_s) < w_{r,t}(\omega_e + \omega_l + \omega_s)$ due to $w_{r,t} > w_{m,t}$ and because $\theta_p < 1$; iii) as a consequence of i) and ii) the term in the second line is always positive; iv) the sign of the term in the first line is ambiguous and depends on the sign of the expression $\omega_l w_{r,t} - p_l \bar{c}_l (\omega_e + \omega_s)$. If this expression is positive, the term in the first line of Equation (10) is negative such that a reduction in the population share of the middle class that is due to an increase in the population share of the rich has a negative effect on average human capital. The intuition is that the rich spend a portion of their income on luxury goods such that the share that they spend on educating their

children is lower in comparison to the middle class. An overall increase of the population share of the rich could therefore reduce the overall ratio of spending on human capital accumulation. Note that the expression $\omega_l w_{r,t} - p_l \bar{c}_l (\omega_e + \omega_s)$ is more likely to be positive if the rich have a strong preference for luxury goods, i.e., if ω_l is relatively large in comparison to ω_e and ω_s.

Inspecting Equation (9), we observe that i) the denominator is again always positive; ii) the sign of the numerator is a priori ambiguous; iii) the term $\theta_r [p_l \bar{c}_l (\omega_e + \omega_s) - \omega_l w_{r,t}]$ has a similar effect as in Equation (10) but it is weighted with the population share of the rich (θ_r); iii) the term $-\bar{c}_s[\omega_e + \omega_l (1 - \theta_r) + \omega_s]$ is always negative. This implies that a larger subsistence need $\bar{c}_s$ reduces the fraction of income that the poor spend on education because a higher $\bar{c}_s$ means that it is more difficult to fulfil the subsistence consumption needs. Therefore, it is again possible that an increase in the population share of the poor reduces average education expenditures.

Altogether, we have a plausible mechanism by which the population share of the middle class raises the share of resources that a society devotes to education. If the fraction of education spending of the middle class is larger than the corresponding fractions of the poor and the rich, then an increase in the relative size of the middle class raises overall human capital accumulation. This is the implication that we test in Section 3.

3 The Size of the Middle Class and Educational Attainment: Empirical Results

In the following, we present the empirical investigation of the effects of the relative size of the middle class on education. The subsequent analysis is based on household data from the Indian subcontinent. While we are aware of the usual concerns about accuracy of household income data for developing countries, we also emphasise the advantages of using Indian villages as the unit of analysis for our project. Not only is India the second most populous country in the world. It also displays a vast heterogeneity with respect to ethno-linguistic and other societal criteria. All subject to a relatively homogeneous legislative landscape. Furthermore, India is characterised by substantial cross- as well as within-state income inequality (see Vannemann and Dubey, 2013, for a comprehensive description). In addition, the data published by the Indian Human Development Survey (IHDS) provides a sound basis for empirical analysis both from a coverage and a quality perspective. The strongest argument for basing our choice of the research subject, however, is the Indian caste system. It is unique regarding its impact on social life and its persistence over centuries, which enables us to use it as a novel instrument for the size of the middle class. This in turn allows us to shed light on the causal effect of the size of the middle class on educational outcomes. Many other attempts to empirically investigate the question at hand are hampered by the lack of a valid instrument for the share of the middle class.

3.1 Measuring the Size of the Middle Class in India

The term *middle class* in social sciences is of ambivalent nature. There exists a wide array of potential characteristics on which the employed definition could be based on. They range from income-based measures to metrics based on occupational functions such as the tier in management hierarchies (Chauvel, 2013). In economics, scholars mostly rely on some income-based variant, where members of the middle class are those whose incomes lie within some interval including the median/mean. This interval is often symmetric with an early example being the study by Thorow (1987) in which the interval ranges from 75% to 125% of the mean (Ravallion, 2010).

While it appears that Thorow's measure has become somewhat of a standard in the literature on affluent economies, there is less consensus on developing economies. The measures used vary widely with the scope of the respective contribution. According to Ravallion (2010), we can identify the following groups: Birdsall et al. (2000), among others, stick closely to the widely used relative measure spanning the aforementioned interval in a study assessing potential changes in size and income shares of the middle class and their relationship to increased integration in global markets. The second group of scholars rely on absolute measures to quantify the middle class. A prominent example is Banerjee and Duflo (2008) who rely on a measure that defines the middle class as households with daily PPP per capita expenditures between \$2 and \$10. In justifying their measure, they argue that it produces similar results with respect to population shares as the income quantiles covered by Thorow's median based relative measure. The third group is represented by Milanovic and Yitzhaki (2002). Those authors' definition of a global middle class includes all persons living on incomes between the mean incomes of Brazil and Italy.

This leaves us with the task of deciding which households we should consider as the middle class in the Indian case. As Figure II shows, India is characterised by an income distribution that is strongly skewed to the left. Daily household incomes per capita in PPP US dollars range from 0.0003 to 303.55 with a mean of 2.91. Clearly, the above mentioned absolute middle class measures are not applicable in the underlying analysis focussing on Indian villages. Following Vannemann and Dubey (2013), we therefore assign all households with incomes between 75% and 250% of the district median income to the middle class. We base our middle class measure on the district median instead of the country median due to the substantial cross-district income differences illustrated in Figure IV. In the presence of a standard deviation that is about half of the mean of this measure, taking the national or even state-level median as a reference would lead to a highly biased measure of the middle class.

By following this strategy, we arrive at a mean share of middle class households per village of 36%. This is comparable to the share of middle class households in the United States in 2010 as reported by the OECD. Furthermore, as Figure III indicates, the skewness of the distribution

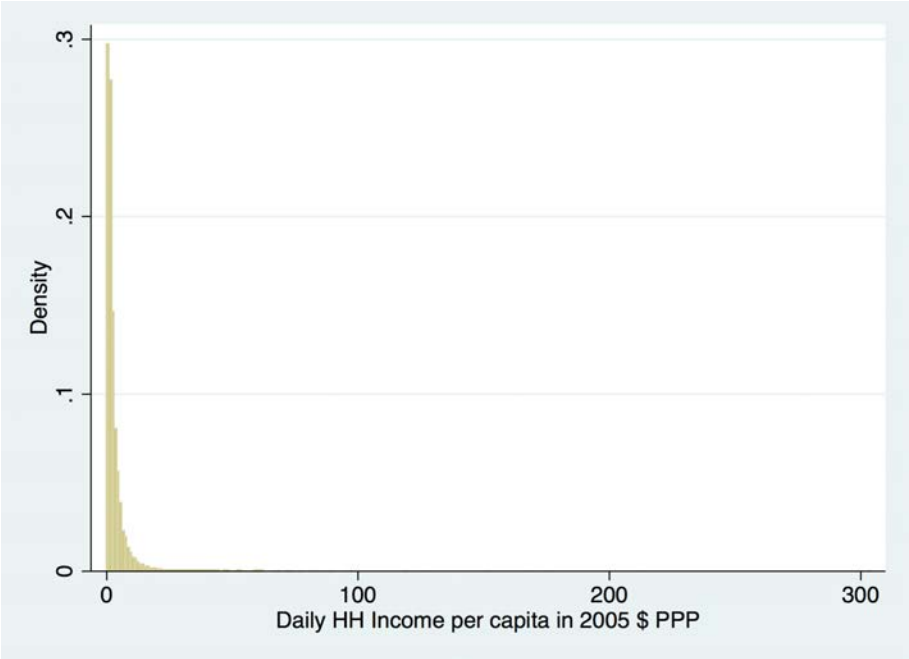


Figure II. Histogram of Indian Household Incomes.

of the middle class shares per village is rather low.

One potential concern with our measure could be that higher shares of middle class households per village coincide with higher mean household incomes in the respective village. Comparing Figures IV and VI, one can see that a high mean income seldom coincides with a large share of middle class households. The unconditional correlation between mean village income and the middle class share is 0.03. This is strong evidence against this potentially problematic correlation.

3.2 Data

Our analysis is based on household, individual, and village level data sets from the Indian Household Survey (IHDS) 2005. The IHDS provides nationally representative data on a multitude of topics sampled from 41,554 households in 1503 villages and 971 urban neighbourhoods for the years 2005 and 2011[1]. The village units are derived from the IHDS' primary sampling units (PSU). They are the lowest level of aggregation unit above the household level for which the IHDS data structure allows. With its extensive coverage both in terms of the representativity and the span of covered topics, it is, to our knowledge, the premier survey covering India. In what follows, we will provide a brief discussion of the key variables and their construction.

The 2005 wave of the IHDS is comprised of 8 data sets of which we utilise the individual file, the household file, and the village file.[2] Our left-hand side variables are created from the individual file, while we construct our key variable of interest and the employed instrumental

[1] The data are available here: `https://ihds.umd.edu`.

[2] The further 5 files cover: medical facilities, non-resident family members, primary school, birth history, and crop production.

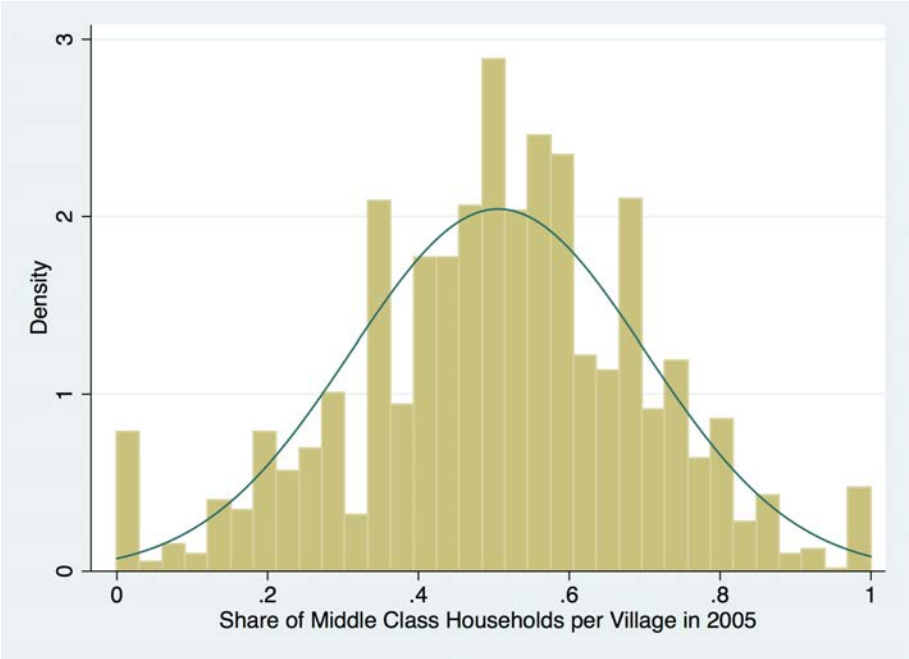


Figure III. Histogram of Middle Class per Village.

variable from the household file and the village file, respectively.

The key dependent variable in our empirical setup is the average educational attainment per PSU. In order to construct this measure, we use the mean years of schooling reported by PSU. Following Castelló-Climent et al. (2017), we restrict our sample to the survey population aged 25 years and above to ensure that the upper end of the education distribution is not censored by age. In order to identify potentially different effects on the educational outcomes of men and women, we run the regression using three different dependent variables: the plain average years of formal schooling per PSU as well as mean male and female education separately. While the cross-PSU mean of our main education measure is 4.8 years, it varies from 0 to 13.8 years[3]. A brief look at

Table I. Descriptive Statistics for Sampling Units

		Mean	Standard Deviation
Log Educational Attainment			
Full Sample	1961	1.733	0.553
Male	1987	1.932	0.467
Female	1987	1.357	1.103
Log Share of Middle-Class Households	1961	-1.017	1.054
Log Household Income	1961	5.303	0.800
Urban dummy	1961	0.324	0.468
Log Distance to Bus Station	1937	-4.573	3.676

[3] The cross-PSU mean for male education is 6.2 with a range from 0 to 14.7. The cross-PSU mean for female

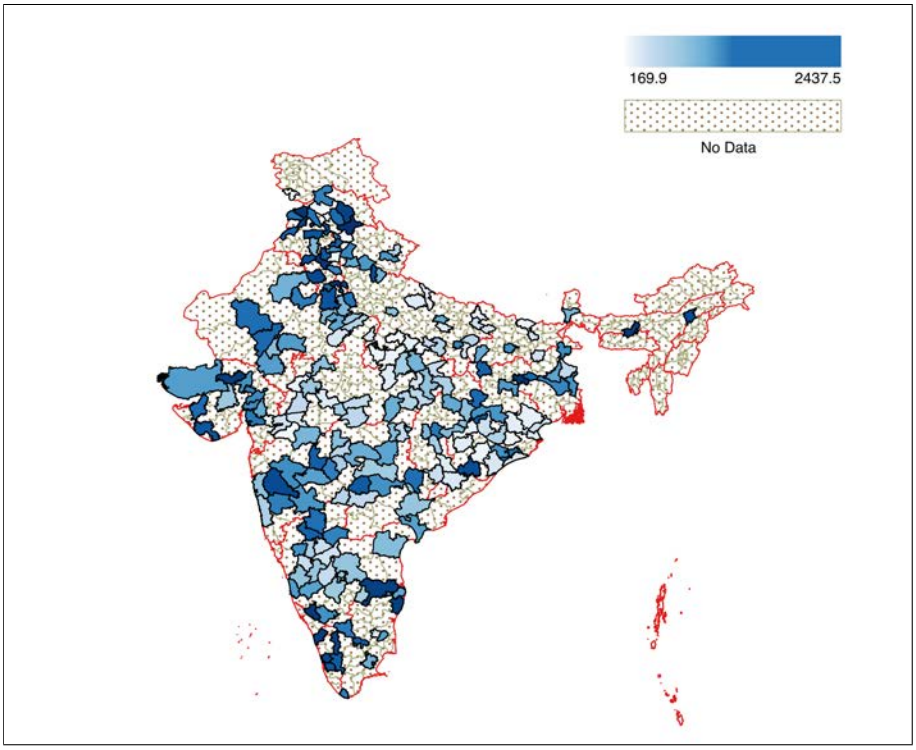


Figure IV. Heatmap of Annual Median Household Incomes per District.

the respective summary statistics for the split sample justifies our strategy to additionally run the regression on dependent variables based on gender. Indian women on average spend roughly half the time in the formal education system as compared to men. Furthermore, this gender difference is more pronounced in rural PSUs as compared to urban areas[4]. Figure V displays the district means of educational attainment for the full sample. The darker the blue, the higher is average years of schooling. One can easily observe that Indian districts exhibit considerable spatial heterogeneity in education. This holds both across and within states, which are indicated by red outlines. For the female sample, the cross-district heterogeneity is roughly 10% higher[5].

While the within-state heterogeneity with regards to educational attainment is already striking, within district heterogeneity is even more pronounced. We are unable to graphically depict this heterogeneity at the lower aggregation level due to location-censoring in the underlying survey. Table I shows that it appears to be even more pronounced within districts. Hence, in our further analysis, we will empirically assess in how far those differences in educational attainment may be driven by differences in the share of middle class households at the PSU level.

The key variable of interest is the proportion of households per sampling unit that belong to the middle class. We use it to estimate the effect of the size of the middle class on educational

education is 3.4 with a range from 0 to 13.6.

[4] In rural areas, women report about 44% of the educational attainment relative to males. In urban areas, the fraction is about 67%.

[5] Figures X and XI in the appendix display the spatial distribution of average years of schooling per district for the male and female samples.

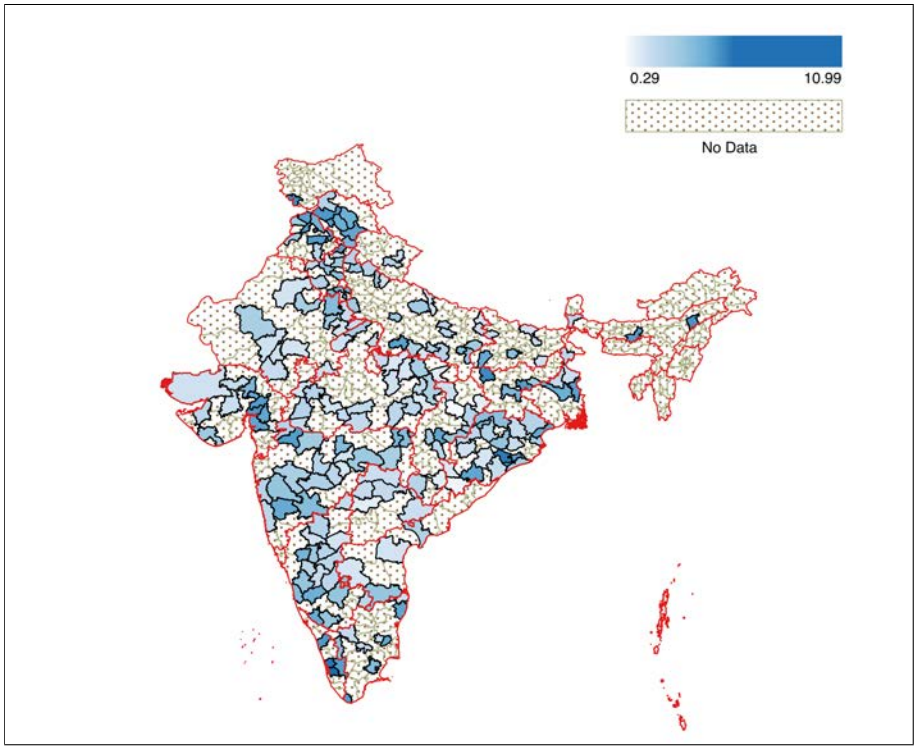


Figure V. District-Level Mean of Education in Years (Full Sample).

attainment. In so doing, we define a household as belonging to the middle class if household income lies between 75% and 250% of its respective district. We chose the district mean over the state or even country mean due to the vast cross-state and cross-district inequality in household per capita incomes[6]. As figure VI illustrates, there is vast heterogeneity in the middle class household shares at the district level. This holds – as with the two previously presented measures – for both the within-state and the cross-state perspective and is also observable comparing adjacent districts.

In Section 1 we discussed the presence of a positive unconditional correlation between the share of middle class households per PSU and our three different education measures. Still, it might be the case that this basic relationship is distorted by potentially confounding factors. In order to purge our specification from those effects, we include an array of control variables in our baseline specification. This includes measures for mean income per PSU ($Income$), the distance to the closest middle school ($Dist.\ School$), the distance to the closest bus station ($Dist.\ Bus$), and a binary indicator for urban status ($Urban$). In addition, all specifications include district-level fixed effects.

[6] Figure XII in the appendix illustrates this considerable heterogeneity at the district level.

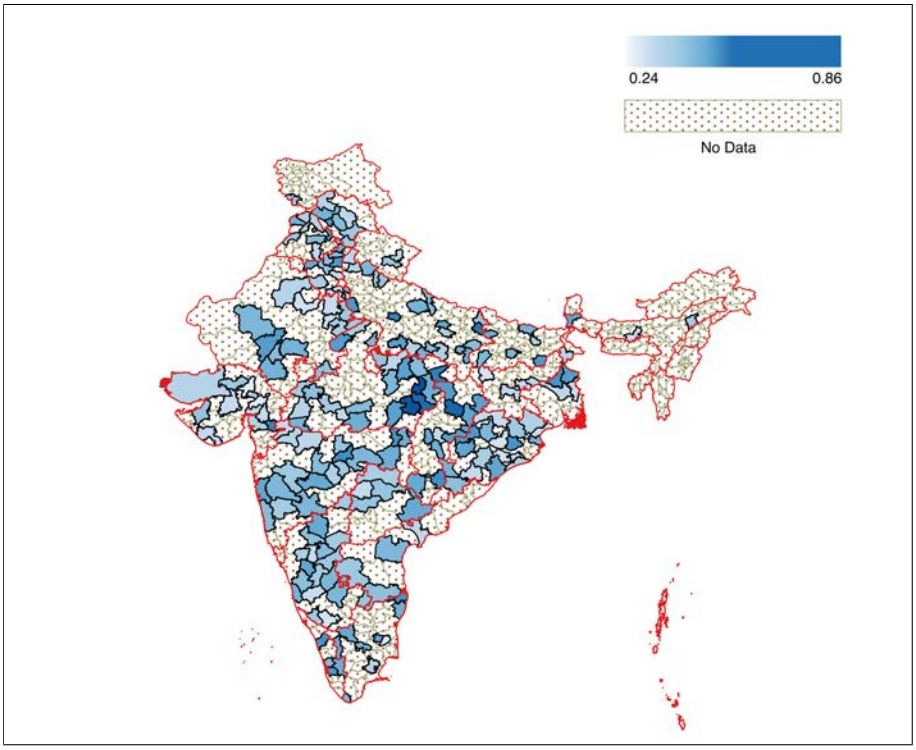


Figure VI. District-Level Mean Share of Middle Class Households.

3.3 Baseline Econometric Specification & Empirical Results

We commence our empirical investigation by a simple OLS estimation of the following equation

$$ln\left(Education_c\right) = \beta \times ln(MiddleClass_c) + Controls + \epsilon_c \tag{11}$$

where $Education_c$ is average educational attainment, c indexes villages, our independent variable of interest is the share of middle-class households in a PSU ($MiddleClass_c$), ϵ_c is the error term, and β is the parameter that we aim to estimate. We run the regression thrice, using the three different measures of educational attainment as dependent variable. We take the logarithm of all employed variables except for the urban dummy.[7] Potentially unobservable confounders are being accounted for by the inclusion of district-specific dummy variables. In all cases, we report robust standard errors. The results of this baseline OLS specification are reported in Tables II to IV.

Comparing columns (1) through (5), we observe that the magnitude of the coefficient of interest remains fairly constant after adding the logarithm of mean PSU income. This indicates that the mean income level appears to be the most important factor to correct for within district differences in PSU-level average educational attainment. All further controls, while being statistically significant and in cases of considerable magnitude, have hardly any noticeable impact

[7] Since it is the case that variables take on the value 0, we add a small number (0.001) to all non-binary variables in the regression.

Table II. Baseline Regression Results (Full Sample)

VARIABLES	(1) Education (full)	(2) Education (full)	(3) Education (full)	(4) Education (full)	(5) Education (full)
Middle Class	0.081***	0.036**	0.040**	0.039**	0.039**
	(0.020)	(0.017)	(0.017)	(0.016)	(0.016)
Income		0.405***	0.396***	0.328***	0.323***
		(0.026)	(0.026)	(0.028)	(0.028)
Dist. School			-0.021***	-0.018***	-0.016***
			(0.005)	(0.005)	(0.005)
Urban				0.357***	0.335***
				(0.038)	(0.039)
Dist. Bus					-0.010*
					(0.005)
Observations	1,937	1,937	1,937	1,937	1,937
R-squared	0.447	0.534	0.540	0.557	0.558

Note: The table reports estimates of Equation (11) with *Education (all)* as dependent variable. All specifications include district fixed effects. Robust standard errors are reported in parentheses, where *, **, and *** indicate significance at 1%, 5%, and 10% level, respectively.

on the strength of the relationship between the size of a PSUs middle class and the associated levels of education. Accordingly, a one standard deviation increase in the share of middle-class households is associated with a 4.2% increase in average years of formal education of the respective PSU's population. Absent the full set of controls, this effect is about twice as large. It is noteworthy that, while being substantially smaller than the strength of the correlation between education and income as well as between education and urbanity, the size of the middle class plays a considerably larger role than the two variables that we included to catch PSU-level differences in the indirect cost of schooling caused by higher commuting costs ($Dist.\ School$ and $Dist.\ Bus$).

Table III. Baseline Regression Results (Male Sample)

VARIABLES	(1) Education (male)	(2) Education (male)	(3) Education (male)	(4) Education (male)	(5) Education (male)
Middle Class	0.066***	0.029*	0.034**	0.033**	0.033**
	(0.018)	(0.016)	(0.016)	(0.016)	(0.016)
Income		0.329***	0.320***	0.271***	0.267***
		(0.025)	(0.025)	(0.027)	(0.028)
Dist. School			-0.020***	-0.018***	-0.016***
			(0.005)	(0.005)	(0.005)
Urban				0.260***	0.240***
				(0.035)	(0.036)
Dist. Bus					-0.009*
					(0.005)
Observations	1,937	1,937	1,937	1,937	1,937
R-squared	0.377	0.449	0.455	0.466	0.467

Note: The table reports estimates of Equation (11) with *Education (male)* as a dependent variable. All specifications include district fixed effects. Robust standard errors are reported in parentheses, where *, **, and *** indicate significance at 1%, 5%, and 10% level, respectively.

Comparing the results from the two alternative regression specifications focussing on male and female educational attainment reported in Tables III and IV yields valuable additional

insights. It appears that the magnitude of the relation between the dependent variable and the independent variables is smaller in the male sample, whereas it becomes substantially larger in the female sample. A first conclusion that we can draw from this fact is that, unsurprisingly, women fare much better education-wise in better-off and urban areas. Similarly, female education exhibits a stronger negative relationship with higher travel costs to school than male education. In addition, it is worth noting that, while the coefficients on the controls such as income or urbanity double or triple relative to the male sample, the magnitude of the relationship to the share of the middle class in the female sample is about seven times as large as compared to the male sample. This can be taken as first evidence for the share of the middle class not only being important for male and overall education but that it is especially strongly correlated with higher educational outcomes for Indian women.

Table IV. Baseline Regression Results (Female Sample)

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Education (fem)	Education (fem)	Education (fem)	Education (fem)	Education (fem)
Middle Class	0.297***	0.215***	0.223***	0.220***	0.220***
	(0.067)	(0.058)	(0.058)	(0.057)	(0.057)
Income		0.742***	0.725***	0.578***	0.571***
		(0.058)	(0.058)	(0.061)	(0.062)
Dist. School			-0.037***	-0.029**	-0.027**
			(0.014)	(0.014)	(0.013)
Urban				0.772***	0.739***
				(0.104)	(0.111)
Dist. Bus					-0.014
					(0.016)
Observations	1,937	1,937	1,937	1,937	1,937
R-squared	0.431	0.479	0.482	0.495	0.496

Note: The table reports estimates of Equation (11) with *Education (fem)* as a dependent variable. All specifications include district fixed effects. Robust standard errors are reported in parentheses, where *, **, and *** indicate significance at 1%, 5%, and 10% level, respectively.

The results from our baseline empirical examination so far suggest a sizeable positive correlation between the share of middle class households and educational attainment. The relationship is robust to the inclusion of a broad set of controls. Furthermore, the relationship is more pronounced if the sample is restricted to women. Due to the likely existence of endogeneity in the underlying relation, these insights do not yield any information on the direction of causality. To address this issue, we turn to an instrumental variable approach in the subsequent sections.

3.4 Using the Share of OBC Households as an Instrument

The Indian caste system is an ancient system of societal stratification that is unique to the Hinduistic culture of the Indian subcontinent. It provides a strictly defined hierarchical order of the society that has been in place for thousands of years and remained largely unchanged until today. This persistence makes it the ideal candidate for a historical instrument for middle class shares. In this section, we describe the historical and sociological characteristics of the Hinduistic

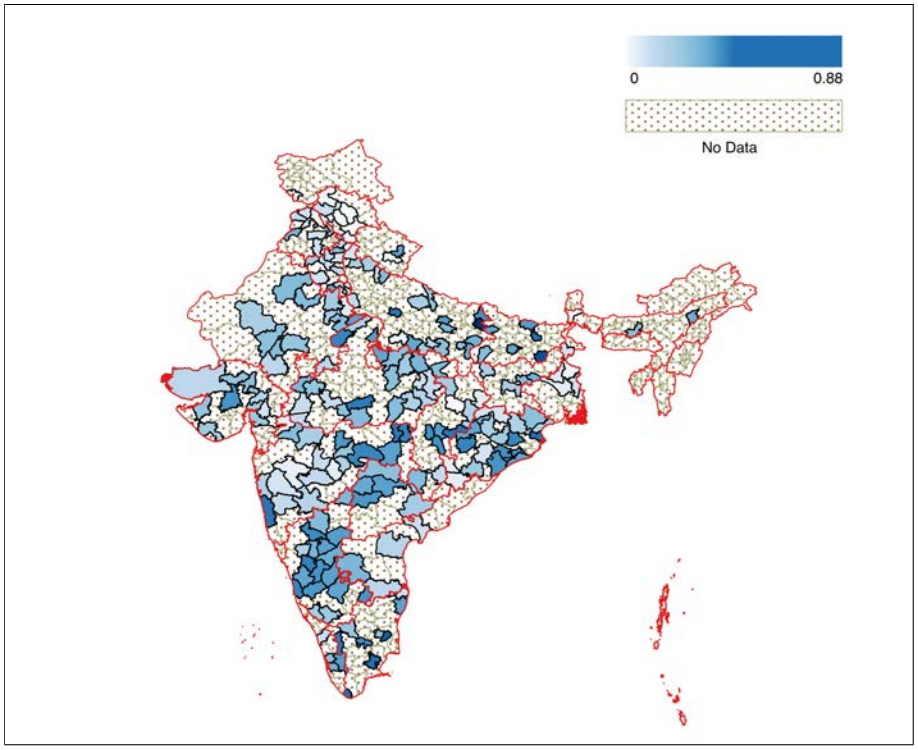


Figure VII. District-Level Mean Share of OBC Households.

caste system that enables the subsequent empirical specification. It is based on Ghurye (1932) which is – until today – one of the most influential contributions on the topic.

The oldest obtainable records about the Indian caste system can be attributed to the Indo-Aryan culture and date back as far as 1500 BCE. While the Indo-Aryan culture was stemming from and in its early times was mostly restricted to the Gangetic Plain, followers of Brahmanism diffused it across the Indian subcontinent. It was first mentioned by a non-local source around 300 BCE. The Greek explorer Megasthenes described it in the following words: "it is not permitted to contract marriage with a person of another caste, nor to change from one profession or trade to another [...]".

Ghurye (1932) lists the following basic characteristics that make the Hinduistic culture a perfect candidate for our IV strategy:

Segmentation of Society. The caste system in the Hinduistic culture was omnipresent. It consisted of five main groups, so-called *varnas*, which were again organised in different sub-groups.[8] While most of the Western cultures linked societal status mainly to wealth, caste membership was solely determined by birth. Accordingly, two soldiers (a profession open to most of the castes) could exhibit the same rank in the military and similar personal wealth, while the hierarchy defined by the *varna*-system would still determine their relative social status

[8] The *jati*-system was rather functional than hierarchical. Mainly, it indicated the occupation of its bearer and also is the basis of Indian surnames. So, basically, two different *jatis* could lie within the same *varna*.

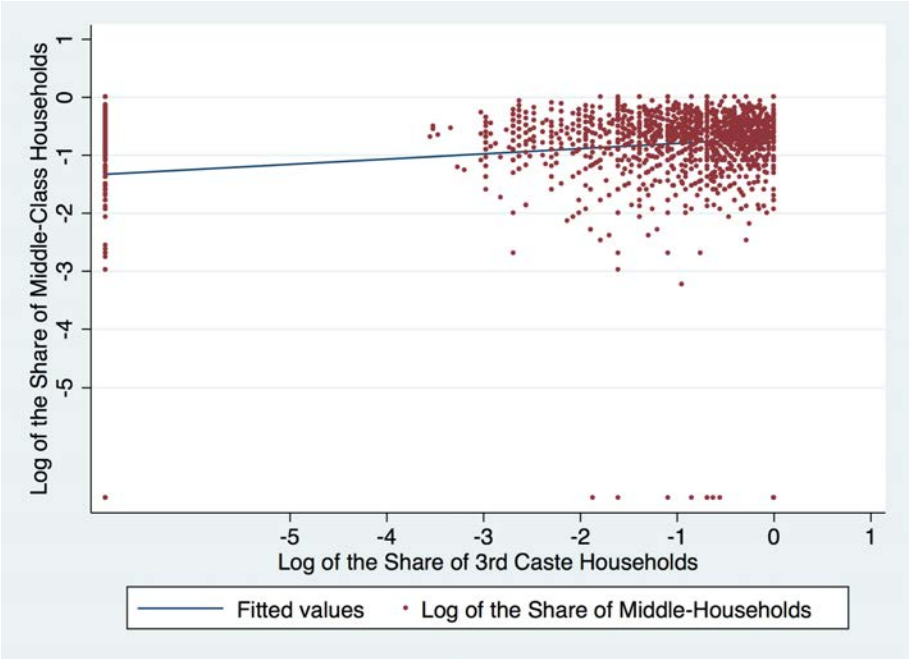


Figure VIII. Cross Sectional Plot of Share of Middle-Class Households Versus Share of OBC Caste Households.

in civil life. In contrast to classes in the Weberian sense, which do not exhibit standing councils or explicit codes of conduct, the majority of the Indian castes had standing committees. Those were ruling on far more issues than, for example, guilds or similar organisations.

The pronounced division of society as a consequence of this system resulted in millennia-old patterns of caste-wise endogamy as well as a clear separation of them within villages.

Hierarchical Structure of Society. In addition to the clear separation, there was also a strict hierarchical order with the *Brahmans* on top. In the hinduistic context, *dharma* describes the notion that each individual has a certain role to play or a function to fill to ensure the upholding of spiritual and social order. The *brahmans* being born into the highest caste exercise priestly and religious tasks. The *kshatriyas* formed the second class which was tasked with administrative and military duties. The third class, the *vaishyas* can be seen as a caste of commoners. Their tasks included agriculture and trading. The lowest of the four *varnas* are the *shudras*. Their duty is to work in all trades that serve the three superior castes which are considered to be twice-born. They would work as farmhands, be shop-owners, etc. The lowest-status group in the hinduistic society are the *dalits*, often also referred to as *untouchables*. While opinions vary whether they can actually be seen as part of the varnas, they undoubtedly are the absolutely lowest group tasked with everything that is considered as unclean such as tanning or cleaning latrines.

The hierarchical system as a whole is strongly related with the notion that spiritual pollution

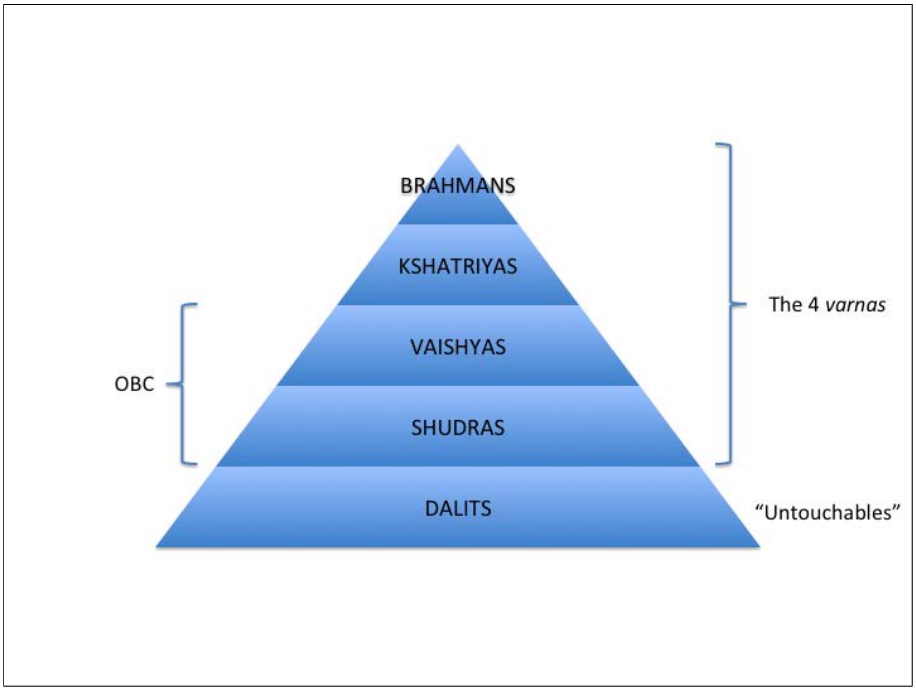


Figure IX. Hierarchical Order of the *varnas* (own depiction based on Ghurye, 1932).

is transmitted from lower towards upper castes. In theory, physical contact between members of a superior and an inferior caste soils the body of the member of the relatively high caste. In some regions of modern India this goes so far that even the shadow of a *dalit* overlapping with the body of a member of a higher caste results in the defiling of the superiors body. This further aggravated the lack of social intercourse between members of different castes and with it also the strong caste-endogamous mating patterns, keeping the caste-principle alive and highly present until today.

The IHDS reports caste membership in the following categories: *Brahmin*, *High Caste*, *Other Backward Caste (OBC)*, *Dalit*. Furthermore, there are four other categories comprising the non-hindu members of the modern Indian society.[9] The OBC definition in the IHDS is very closely linked to the castes of *Vaishyas* and *Shudras*. As the historical functions of those castes most closely resembles the modern image of a middle-class household, we suggest the proportion of OBC households per village as an instrument for middle class shares at the village level in the subsequent instrumental variable analysis. Figure VIII clearly indicates that there exists a positive relationship between the shares of middle-class households and the share of OBC households at the village level.

[9] Those categories are: *Adivasi* (mostly animistic tribes), *Muslim*, *Sikh/Jain* and *Christian*. As we exclude all these categories from the empirical analysis because the focus is on hinduistic India, we do not go further into the details at this point.

3.5 Instrumental Variable Specification and Empirical Results

In this section, we present the instrumental variable specification and the results from running the cross-section model presented in Subsection 3.3. In particular, we modify Equation (11) such that we use the share of *OBC*-households per village as an instrument for the share of middle-class households. The set of employed control variables and fixed effects remains the same.

Table V presents the results from the IV regression. Panel A indicates a positive and significant coefficient for the share of OBC households. The magnitude of the coefficient is slightly diminishing with the inclusion of additional controls moving from column (1) to (5). In presence of the full set of control variables displayed in column (5), a one standard deviation increase in the share of OBC households is associated with a 27,7% increase in the share of middle-class households in the respective PSU. This estimate is significant at the 1%-level. As indicated by the Kleibergen-Paap statistic and the F-statistic across panels B through D, our specification is not affected by weak identification issues.[10]

Panel B in Table V reports the second-stage results for average PSU education as dependent variable. The IV coefficient on the share of middle-class households as reported in column (5) is 0.358 and it is significant at the 1%-level. This implies that a one percent increase in the share of the middle class induces an 0.358% increase in average years of schooling. Accordingly, the results obtained from the IV specification support the findings of the above OLS specification. Moreover, in the IV specification it appears that the obtained coefficients on the share of middle-class households are far less sensitive to the inclusion of additional controls as compared to the baseline OLS results.

Turning to panels C and D, we now discuss the insights obtained from the sample split into men and women. As with the overall education measure as dependent variable, there is no indication of weak instrument bias in any of the specifications. While the coefficient on the middle-class share is slightly smaller for the male sample as compared to the overall sample, with a magnitude of 0.855 in column (5), the impact of an increase in the share of middle-class households is more than twice as high in the female sample. This suggests that the effect of a larger middle class on female education is far higher as compared to the effect on male education. One potential explanation is that middle class households not only put a special emphasis on education in general but on female education specifically.

Keeping in mind the paternalistic structure of the Indian society, another potentially important channel comes to mind: assortative mating, a well-researched regularity found throughout most of the western developed countries. The basic finding of this strand of the literature is that individuals are likely to marry spouses who carry similar characteristics across a wide variety

[10] The critical values of the test provided by Stock and Yogo (2005) are 16.38, 8.96, 6.66, and 5.53 for a 10%, 15%, 20%, and 25% bias of the obtained estimator, respectively. Accordingly, the null hypothesis of the underlying estimators being biased due to weak instrumentation are rejected in all cases.

Table V. Instrumental Variables Results: Different Dependent Variables

	(1)	(2)	(3)	(4)	(5)
Panel A: First Stage - Share of MC Households on Share of OBC Households					
OBC Share	0.132***	0.125***	0.119***	0.119***	0.122***
	(0.021)	(0.020)	(0.021)	(0.022)	(0.022)
Panel B: Second Stage - Education (full)					
Middle Class	0.411***	0.370***	0.360***	0.363***	0.358***
	(0.102)	(0.102)	(0.099)	(0.098)	(0.098)
Kleibergen-Papp F Stat.	30.32	30.41	30.94	30.94	30.70
ARW F Stat.	20.87	17.13	17.10	17.68	17.38
Observations	1,937	1,937	1,937	1,937	1,937
Panel C: Second Stage - Education (male)					
Middle Class	0.374***	0.342***	0.333***	0.335***	0.330***
	(0.098)	(0.100)	(0.097)	(0.096)	(0.096)
Kleibergen-Papp F Stat.	29.89	29.98	30.50	30.50	30.26
ARW F Stat.	17.67	14.23	14.18	14.51	14.30
Observations	1,965	1,965	1,965	1,965	1,965
Panel D: Second Stage - Education (female)					
Middle Class	0.947***	0.874***	0.857***	0.863***	0.855***
	(0.229)	(0.227)	(0.222)	(0.222)	(0.222)
Kleibergen-Papp F Stat.	29.89	29.98	30.50	30.50	30.26
ARW F Stat.	19.48	18.19	17.98	18.30	17.94
Observations	1,965	1,965	1,965	1,965	1,965
Controls					
District FE	YES	YES	YES	YES	YES
Income	NO	YES	YES	YES	YES
Dist. School	NO	NO	YES	YES	YES
Urban	NO	NO	NO	YES	YES
Dist. Bus	NO	NO	NO	NO	YES

Note: The table reports IV estimates of Equation (11) with alternating education variables as a dependent variable. Robust standard errors are reported in parentheses, where *, **, and *** indicate significance at 1%, 5%, and 10% level, respectively.

of aspects (Lefgren and McIntyre, 2006). With regards to labour market characteristics and educational attainment, Hout (1982) finds a strong association between husbands' and wifes' occupational statuses. In addition, Cancian et al. (1993) and Juhn and Murphy (1997) find that women with promising labour market characteristics are more likely to marry men with high wages, while Pencavel (1999) shows that those trends appear to have intensified over the second half of the last century in the developed world. This notion is supported with updated data for the time span from 1962 to 2003 in a more recent contribution by Schwartz and Mare (2005).

While the assortative mating channel is of large importance in the western world, the evidence regarding the Indian sub-continent remains relatively scarce. In a case study focussing on the Tamil Brahman subcaste of the "Eighteen Village Vattimas", Fuller and Narasimhan (2008) find that education and employment have become the crucial criteria for the arrangement of marriages in recent decades. They claim that for men who usually marry in their late twenties to early thirties, education and current or prospective labour market outcomes are by far the most crucial factors determining the assortative mating potential. With regards to women they find that the factors impacting the prestige ranking are basically the same. The main differences the authors report are that this is less a question of potentially higher expected incomes than rather focussed on matching the spouse's education. Namely, women with higher educational attainment are seen as "more congenial partners for educated men" (Fuller and Narasimhan, 2008). Also, the authors conclude that women may actively participate in the labour market until they give birth to children and thereby at least temporarily contribute to household (market) income. In addition, more educated women are seen as better qualified to assist in their children's education. To sum up, Fuller and Narasimhan (2008) conclude the every Vattima interviewee inevitably discusses individual education and career perspectives when discussing grown-up children and their marriage prospects. Pache-Huber (2004) describes similar findings for the middle-class Maheshwaris in Rajasthan. Our results support all these findings.

Table VI. Instrumental Variables Results: Rural Sample

	(1)	(2)	(3)
Dep. Var.:	Education (full)	Education (male)	Education (female)
Panel A: First Stage - Share of MC Households on Share of OBC Households			
OBC Share	0.105***	0.154***	0.154***
	(0.023)	(0.056)	(0.056)
Panel B: Second Stage - Education			
Middle Class	0.517***	0.486***	1.171***
	(0.169)	(0.167)	(0.369)
Kleibergen-Papp F Stat.	19.97	19.97	19.97
ARW F Stat.	13.05	11.06	12.34
Observations	1,320	1,320	1,320
Controls			
District FE	YES	YES	YES
Income	YES	YES	YES
Dist. School	YES	YES	YES
Dist. Bus	YES	YES	YES

Note: The table reports IV estimates of Equation (11) with alternating education variables as a dependent variable. Urban districts are excluded. Robust standard errors are reported in parentheses, Robust standard errors are reported in parentheses, where *, **, and *** indicate significance at 1%, 5%, and 10% level, respectively.

In order to provide some insights on how our results might differ once we compare rural to urban India, we present the results obtained from running the IV regression of Equation (11) on rural and urban sub-samples in Tables VI and VII, respectively.

Table VII. Instrumental Variables Results: Urban Sample

	(1)	(2)	(3)
Dep. Var.:	Education (full)	Education (male)	Education (female)
First Stage - Share of MC Households on Share of OBC Households			
OBC Share	0.154***	0.154***	0.154***
	(0.056)	(0.056)	(0.056)
Middle Class	0.137**	0.124**	0.194*
	(0.059)	(0.051)	(0.102)
Kleibergen-Papp F Stat.	7.645	7.645	7.645
ARW F Stat.	3.917	4.271	2.842
Observations	645	645	645
Controls			
District FE	YES	YES	YES
Income	YES	YES	YES
Dist. School	YES	YES	YES
Dist. Bus	YES	YES	YES

Note: The table reports IV estimates of Equation (11) with alternating education variables as a dependent variable. Rural districts are excluded. Robust standard errors are reported in parentheses, where *, **, and *** indicate significance at 1%, 5%, and 10% level, respectively.

The first-stage results for the rural sample reported in Panel A of Table VI indicate that the impact of the share of OBC households on the share of middle-class households is of similar magnitude as compared to the full sample. As before, it appears that there is no weak instrument bias in this specification as both the Kleibergen-Paap statistic as well as the F-statistic are above the critical values.

Comparing the second-stage results as reported in columns (1) through (3) to their counterparts in Table V, we observe that the causal effect of increasing the size of the middle class by 1% is to increase average years of formal schooling in rural India by 0.517%. This implies that the effect of middle-class shares in a rural setting is about 44% larger as compared to the full sample. Comparing the coefficients on middle class size obtained from running the rural regression taking the male and female education as dependent variable as reported in columns (2) and (3), we observe a similar pattern as on the full sample. While the coefficient obtained when focussing on male education is slightly smaller than in the average education case, the coefficient in the female education scenario is more than twice as large in magnitude as the coefficient obtained from the male sample. We take those findings as evidence that the motives that drive the differences between men and women are stronger in rural parts of India. This is hardly surprising taking the realistic assumption that urban areas are characterised by a less traditional

and a more egalitarian society relative to their rural counterparts.

Summing up our findings from the different instrumental variable estimations, we find that the share of middle-class households in Indian villages has a sizeable and robust positive effect on educational outcomes. This effect is especially pronounced when focussing on female educational attainment. In addition, we find that the size of the middle class appears to have a stronger impact on educational outcomes in rural India.

4 Conclusion

We present a stylised household consumption model in which heterogeneous individuals can chose between three different categories of goods: subsistence consumption needs, education of children, and luxury goods. We show that the poor spend most of their income on subsistence consumption needs and the rich spend a positive (and potentially large) part of their budget on luxury goods such that the middle class has the highest expenditure share on education. Depending on class-specific differences, this provides a plausible pathway by which a rise in the relative size of the middle class raises the share of spending on education to the extent that educational outcomes depend positively on the share of the middle class. To test this hypothesis empirically, we use detailed survey data on Indian household incomes, educational attainment, and important control variables drawn from the household survey and village surveys.

In order to test the causal effect of the share of middle-class households on average educational attainment per village, we use detailed information on the shares of different castes according to the *Varna*-system. We use those shares in a – to our knowledge – novel instrumental variable specification. Our empirical analysis shows that larger shares of middle-class households in Indian villages indeed have a sizeable positive effect on average educational outcomes. Our results suggest that this effect is more pronounced in rural settings as compared to urban areas and for women as compared to men.

Altogether our results emphasize the importance of a sizeable middle class for education, and, via this pathway, potentially on other socioeconomic outcomes such as income growth and democratization. Therefore, it appears to be a warning sign if the share of the middle class shrinks and a larger part of the population belongs to the poor or to the rich.

Appendix

A The first-order conditions

The Lagrangian for the optimization problem is

$$\mathcal{L} = \omega_s \log(c_{s,t} - \bar{c}_s) + \omega_h \log(h_t) + \omega_l \log(c_{l,t} + \bar{c}_l) + \lambda_t (w_t - c_{s,t} - h_t - p_{l,t} c_{l,t}).$$

The associated necessary first-order conditions for an interior optimum are given by

$$\frac{\partial \mathcal{L}}{\partial c_{s,t}} = \frac{\omega_s}{c_{s,t} - \bar{c}_s} - \lambda_t \stackrel{!}{=} 0, \tag{A.1}$$

$$\frac{\partial \mathcal{L}}{\partial h_t} = \frac{\omega_e}{h_t} - \lambda_t \stackrel{!}{=} 0, \tag{A.2}$$

$$\frac{\partial \mathcal{L}}{\partial c_{l,t}} = \frac{\omega_l}{c_{l,t} - \bar{c}_l} - \lambda_t p_{l,t} \stackrel{!}{=} 0 \tag{A.3}$$

and the budget constraint $w_t = c_{s,t} + h_t + p_{l,t} c_{l,t}$. In this case, we have four equations to solve for the four unknowns $c_{s,t}$, h_t, $c_{l,t}$, and λ_t. Solving the corresponding system of equations for $c_{s,t}$, h_t, and $c_{l,t}$ yields

$$c_{s,t} = \frac{\omega_s (w_t + p_{l,t} \bar{c}_l) + (\omega_h + \omega_l) \bar{c}_s}{\omega_s + \omega_h + \omega_l}, \tag{A.4}$$

$$h_t = \frac{\omega_h (w_t + p_{l,t} \bar{c}_l - \bar{c}_s)}{\omega_s + \omega_h + \omega_l}, \tag{A.5}$$

$$c_{l,t} = \frac{\omega_l (w_t - \bar{c}_s) - p_{l,t} (\omega_h + \omega_s) \bar{c}_l}{p_{l,t} (\omega_s + \omega_h + \omega_l)}. \tag{A.6}$$

These results hold for an income level w_t for which the numerator of Equation (A.6) is positive which is the case as long as $w_t > p_{l,t}(\omega_h + \omega_s)\bar{c}_l/\omega_l + \bar{c}_s$. In the following, we denote the income level for which this expression is fulfilled with equality by $\hat{w}_t$. In case of a lower income level than $\hat{w}_t$, households do not consume luxury goods and face the following Lagrangian:

$$\mathcal{L} = \omega_s \log(c_{s,t} - \bar{c}_s) + \omega_h \log(h_t) + \lambda_t (w_t - c_{s,t} - h_t).$$

The necessary first-order conditions for this optimization problem are given by

$$\frac{\partial \mathcal{L}}{\partial c_{s,t}} = \frac{\omega_s}{c_{s,t} - \bar{c}_s} - \lambda_t \stackrel{!}{=} 0, \tag{A.7}$$

$$\frac{\partial \mathcal{L}}{\partial h_t} = \frac{\omega_e}{h_t} - \lambda_t \stackrel{!}{=} 0 \tag{A.8}$$

and the modified budget constraint $w_t = c_{s,t} + h_t$. In this case, we have three equations to solve for the three unknowns $c_{s,t}$, h_t, and λ_t. Solving the corresponding system of equations for $c_{s,t}$

and h_t yields

$$c_{s,t} = \frac{\omega_s w_t + \omega_h \bar{c}_s}{\omega_s + \omega_h}, \tag{A.9}$$

$$h_t = \frac{\omega_h (w_t - \bar{c}_s)}{\omega_s + \omega_h}. \tag{A.10}$$

We assume that incomes are sufficiently high so as to fulfil the basic subsistence consumption needs, i.e., it holds that $w_t > \bar{c}_s$. Altogether, we can therefore summarize our findings by means of the following system of demand functions

$$c_{s,t} = \begin{cases} \frac{\omega_s w_t + \omega_h \bar{c}_s}{\omega_s + \omega_h} & \text{for } \bar{c}_s < w_t < \hat{w}_t, \\ \frac{\omega_s (w_t + p_{l,t} \bar{c}_l) + (\omega_h + \omega_l) \bar{c}_s}{\omega_s + \omega_h + \omega_l} & \text{for } \hat{w}_t < w_t, \end{cases}$$

$$h_t = \begin{cases} \frac{\omega_h (w_t - \bar{c}_s)}{\omega_s + \omega_h} & \text{for } \bar{c}_s < w_t < \hat{w}_t, \\ \frac{\omega_h (w_t + p_{l,t} \bar{c}_l - \bar{c}_s)}{\omega_s + \omega_h + \omega_l} & \text{for } \hat{w}_t < w_t, \end{cases}$$

$$c_{l,t} = \begin{cases} 0 & \text{for } \bar{c}_s < w_t < \hat{w}_t, \\ \frac{\omega_l (w_t - \bar{c}_s) - p_{l,t} (\omega_h + \omega_s) \bar{c}_l}{p_{l,t} (\omega_s + \omega_h + \omega_l)} & \text{for } \hat{w}_t < w_t. \end{cases}$$

Since the Lagrangian is strictly concave because the utility function is strictly concave in all three arguments and the budget constraint is linear, the first-order conditions are not only necessary but also sufficient. Thus, they identify the global unique optimal choice.

B Data Appendix

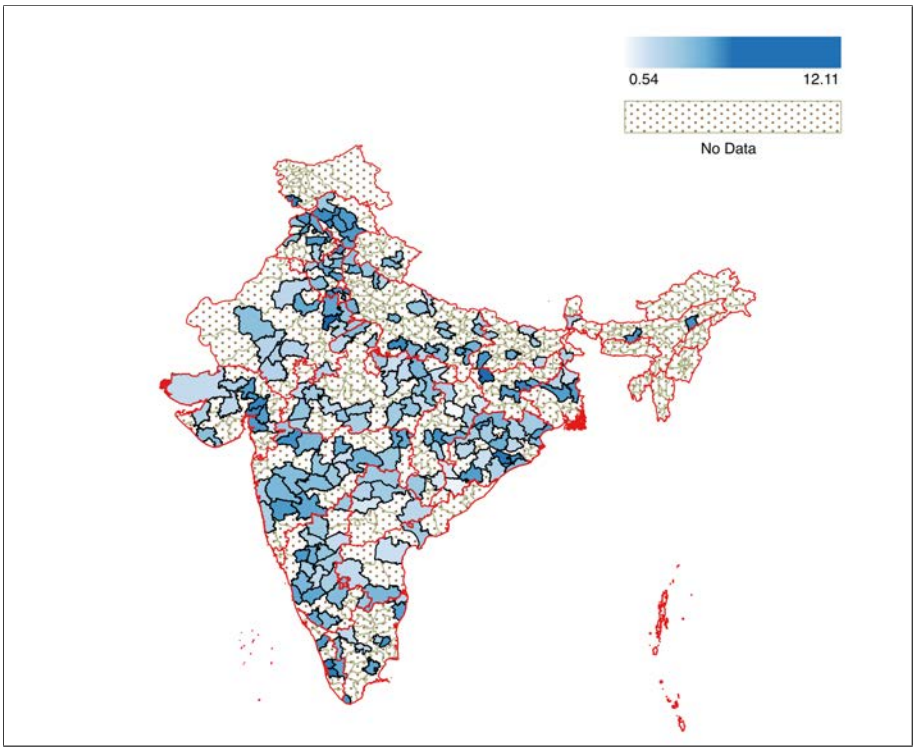


Figure X. District-Level Mean of Education in Years (Male Sample).

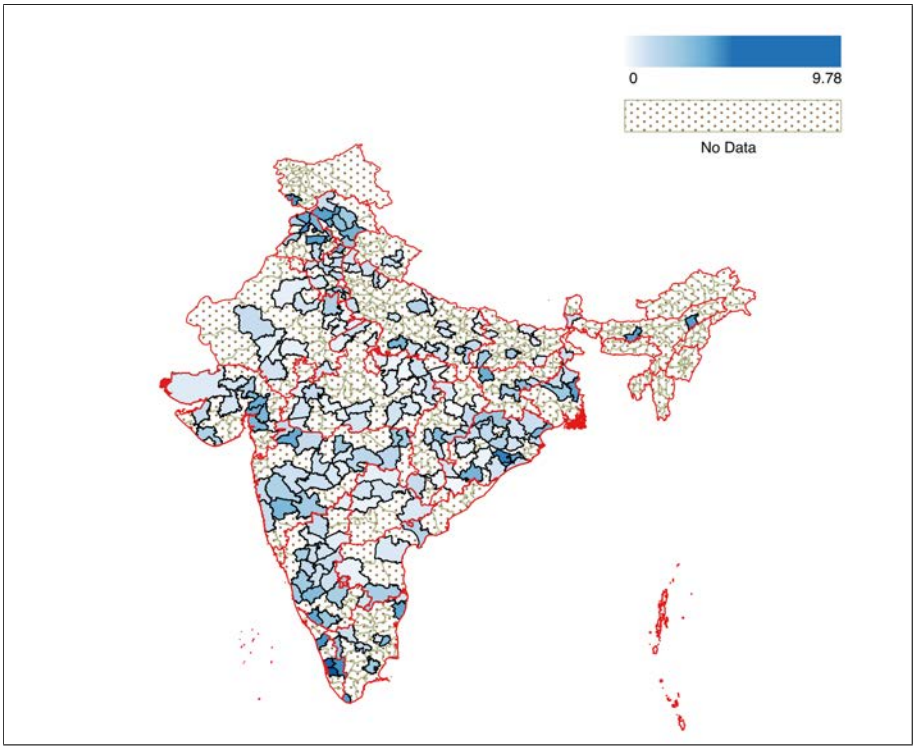


Figure XI. District-Level Mean of Education in Years (Female Sample).

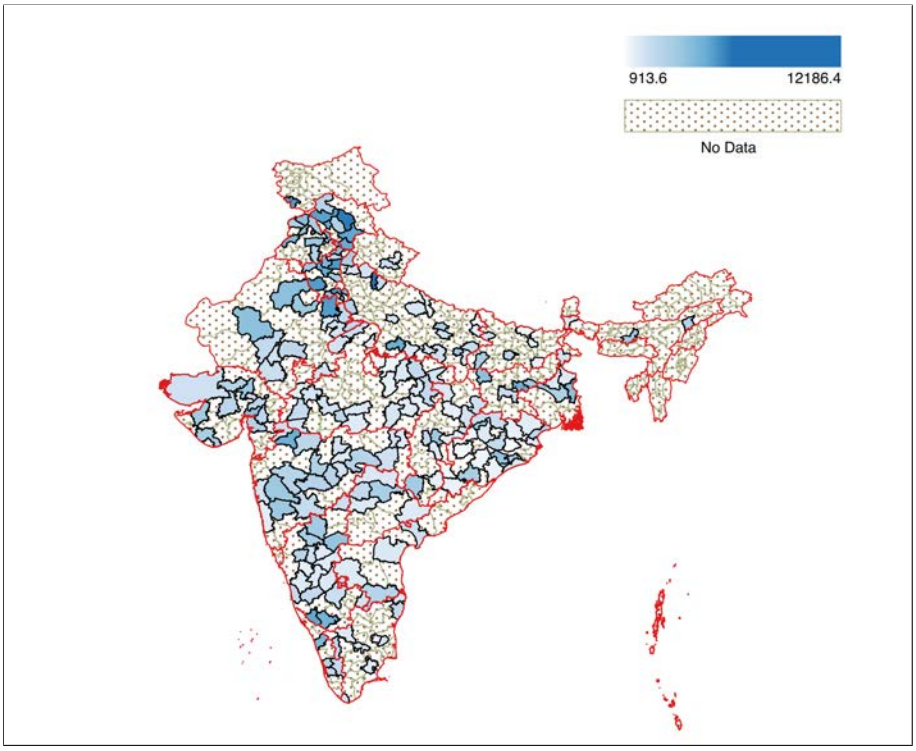


Figure XII. District-Level Mean of Household Income per capita (in INR).

References

Alesina, A. and Perotti, R. (1996). Income distribution, political instability, and investment. *European Economic Review*, 40(6):1203–1228.

Andreoni, J. (1989). Giving with Impure Altruism: Applications to Charity and Ricardian Equivalence. *Journal of Political Economy*, 97(6):1447–1458.

Banerjee, A. V. and Duflo, E. (2008). What is Middle Class about the Middle Classes around the World? *Journal of Economic Perspectives*, 22(2):3–28.

Barro, R. J. (1999). Determinants of democracy. *Journal of Political Economy*, Vol. 107(No. 6):S158–S183.

Birdsall, N., Graham, C., and Pettinato, S. (2000). Stuck In The Tunnel: Is Globalization Muddling The Middle Class?

Bloom, D. E., Kuhn, M., and Prettner, K. (2017). Invest in Women and Prosper. *Finance & Development*, Vol. 54:50–55.

Cancian, M., Danziger, S., and Gottschalk, P. (1993). Working Wives and Family Income Inequality Among Married Couples. In *Uneven Tides*, Rising Inequality in America, pages 195–222. Russell Sage Foundation.

Cass, D. (1965). Optimum Growth in an Aggregative Model of Capital Accumulation: A Turnpike Theorem. *The Review of Economic Studies*, 32(3):233–240.

Castelló-Climent, A., Chaudhary, L., and Mukhopadhyay, A. (2017). Higher Education and Prosperity: From Catholic Missionaries to Luminosity in India. *The Economic Journal*.

Chauvel, L. (2013). Welfare Regimes, Chorts, and the Middle Class. In Gornick, J. C. and Jäntti, M., editors, *Income Inequality - Economic Disparitites and the Middle Class in Affluent Countries*, pages 115 – 144. Stanford University Press, Stanford, 1st edition.

Collier, P. (2004). Greed and Grievance in Civil War. *Oxford Economic Papers*, 56(4):563–595.

Diamond, P. A. (1965). National Debt in a Neoclassical Growth Model. *The American Economic Review*, 55(5):1126–1150.

Diebolt, C. and Perrin, F. (2013). From Stagnation to Sustained Growth: The Role of Female Empowerment. *American Economic Review*, 103(3):545–549.

Doepke, M. and Zilibotti, F. (2008). Occupational Choice and the Spirit of Capitalism. *Quarterly Journal of Economics*, 123(2):747–793.

Fuller, C. and Narasimhan, H. (2008). Companionate marriage in India: the changing marriage system in a middle-class Brahman subcaste. *Journal of the Royal Anthropological Institute*, 14(4):736–754.

Galor, O. (2005). From Stagnation to Growth: Unified Growth Theory. In *Handbook of Economic Growth*, volume 1, Part A, pages 171–293. Elsevier.

Galor, O. (2011). *Unified Growth Theory*. Princeton University Press.

Galor, O., Moav, O., and Vollrath, D. (2009). {I}nequality in {L}andownership, the {E}mergence of {H}uman-{C}apital {P}romoting {I}nstitutions, and the {G}reat {D}ivergence. *The Review of Economic Studies*, Vol. 76:143–179.

Galor, O. and Weil, D. N. (2000). Population, Technology, and Growth: From Malthusian Stagnation to the Demographic Transition and Beyond. *American Economic Review*, 90(4):806–828.

Ghurye, G. (1932). *Caste and Race in India*. Kegan Paul, Trench, Trübner, London.

Glaeser, E. L., La Porta, R., Lopez-de Silanes, F., and Shleifer, A. (2004). {D}o {I}nstitutions {C}ause {G}rowth? *Journal of Economic Growth*, Vol. 9:271–303.

Hout, M. (1982). The Association between Husbands' and Wives' Occupations in Two-Earner Families. *American Journal of Sociology*, 88(2):397–409.

Juhn, C. and Murphy, K. M. (1997). Wage Inequality and Family Labor Supply. *Journal of Labor Economics*, 15(1, Part 1):72–97.

Koopmans, T. (1965). On the concept of optimal economic growth. In *The Econometric Approach to Development Planning*. North Holland, Amsterdam.

Lefgren, L. and McIntyre, F. (2006). The Relationship between Women's Education and Marriage Outcomes. *Journal of Labor Economics*, 24(4):787–830.

Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22(1):3–42.

Milanovic, B. and Yitzhaki, S. (2002). DECOMPOSING WORLD INCOME DISTRIBUTION: DOES THE WORLD HAVE A MIDDLE CLASS? *Review of Income and Wealth Series*, 48(2).

Ostby, G. and Urdal, H. (2011). Education and Civil Conflict: A Review of the Quantitative, Empirical Literature.

Pache-Huber, V. (2004). *Le mariage de l'amour et de la raison: stratégies matrimoniales de la classe moyenne en Inde*. LIT Verlag, Münster.

Pencavel, J. (1999). Assortative Mating by Schooling and the Timing of Marriage.

Prettner, K. and Strulik, H. (2017). Gender equity and the escape from poverty. *Oxford Economic Papers*, 69(1):55–74.

Ravallion, M. (2010). The Developing World's Bulging (but Vulnerable) Middle Class. *World Development*, 38(4):445–454.

Romer, P. M. (1990). Endogenous Technological Change. *Journal of Political Economy*, 98(5):S71–S102.

Schwartz, C. R. and Mare, R. D. (2005). Trends in Educational Assortative Marriage From 1940 to 2003. *Demography*, 42(4):621–646.

Solow, R. (1956). A Contribution to the Theory of Economic Growth. *Quarterley Journal of Economics*, 70(1):65–94.

Stock, J. and Yogo, M. (2005). *Testing for Weak Instruments in Linear IV Regression*, pages 80–108. Cambridge University Press, New York.

Strulik, H., Prettner, K., and Prskawetz, A. (2013). The past and future of knowledge-based growth. *Journal of Economic Growth*, 18(4):411–437.

Tadjoeddin, M. Z. and Murshed, S. M. (2007). Socio-Economic Determinants of Everyday Violence in Indonesia: An Empirical Investigation of Javanese Districts, 1994—2003. *Journal of Peace Research*, 44(6):689–709.

Thorow, L. C. (1987). A Surge in Inequality. *Scientific American*, 256(5):30 – 37.

Vannemann, R. and Dubey, A. (2013). Horizontal and Vertical Inequalities in India. In Gornick, J. C. and Jäntii, M., editors, *Income Inequality - Economic Disparitites and the Middle Class in Affluent Countries*, chapter 16, pages 439 – 458. Stanford University Press, Stanford, 1st edition.

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