ISSN 1756-7904

DEV INTERNATIONAL DEVELOPMENT University of East Anglia

Working Paper Series

Caste dominance and economic performance in rural India

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2010

UEA University of East Anglia

Working Paper 25

The School of International Development, University of East Anglia
Norwich, NR4 7TJ, United Kingdom

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First published by the School of International Development in October 2010.

This publication may be cited as:
Iversen, V., Kalwij, A., Verschoor, A., & Dubey, A., 2010, Caste dominance and economic performance in rural India, Working Paper 25, DEV Working Paper Series, The School of International Development, University of East Anglia, UK.

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ISSN 1756-7904

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Acknowledgements

For very helpful comments and suggestions, we are indebted to Farzana Afridi, Siwan Anderson, Ashwini Deshpande, Stefan Jonsson, Anirban Mitra, Rinku Murgai, Richard Palmer-Jones, Debraj Ray and Kunal Sen. A special thanks to Richard Palmer-Jones for sharing the classification of agro-ecological zones used in this paper.

Abstract

Using a unique household panel data set for rural India covering the years 1993/1994 and 2004/2005 we test a key theoretical assertion of caste and its effects, namely that marginalised social groups fare worse in terms of income levels when resident in villages dominated by upper castes. We also test whether marginalised groups perform better or worse in villages where their own group is dominant and explore the implications for income growth and for poverty incidence and persistence. After controlling for potential locational confounds, upper caste dominance confers a positive externality on other social groups equivalent to about 10 percent of mean income in both survey rounds. This externality is discounted by group specific 'oppression' effects for Scheduled Caste (SC) and Other Backward Classes (OBC) households, which in 2004/05 depressed SC and OBC mean income in upper caste dominated villages by about 14 and 12 percent, respectively, and raised the percentage in poverty by respectively 6 and 5 points. Further, we identify large, positive own dominance or 'enclave' effects that account for a quarter of mean income for SC households in SC dominated villages in the post reform years. Our results are robust to how dominance is measured. We also identify pathways through which identity-based disparities may be reduced; while education matters, land redistribution provides the key to eliminating the adverse effects of upper caste dominance. After adding factor endowment and other controls and with the notable exception of those in SC dominated villages, SCs not only perform worse than other groups but have fallen further behind during the post reform years.

I. Introduction

IA. Aim and motivation

In economics, various mechanisms are recognized that, in a stratified society, link economic welfare with signifiers of social identity such as caste, religion and ethnicity. Some such mechanisms originate in 'taste-based' (e.g. Becker 1971) or 'statistical' (e.g. Arrow 1972) discrimination by others and may be thought of as external to the affected group. Other mechanisms are internal to the group in question, and hinge on not how the group is seen and treated by others, but how its members perceive and interact among themselves.[1] The consequences for economic

[1] While competitive pressures could eliminate taste-based discrimination, affirmative action may alleviate persistent disadvantage when employers, constrained by imperfect information, use group identity as indicator of productivity (e.g.

performance of a self-image that group membership imparts (Akerlof and Kranton 2000) and of the onset of collective inertia (e.g. Peyton Young 2001) are two examples.

Several internal and external mechanisms linking social identity and economic welfare, possibly with effects in opposite directions, may operate simultaneously. Whether the net effect for any particular group will be positive or negative may be approached from a political economy angle by making the unheroic assumption that a group's relative economic or political power (which we define precisely below) bears on the mechanism that ultimately will prevail.

In this paper we explore empirically the proposition that the balance of forces linking social identity to economic welfare is influenced by the relative economic or political power of the various social groups that live and work in each other's vicinity, to be precise, reside in the same village. We undertake this empirical inquiry for rural India, whose village communities can be seen as a paradigm of social stratification (e.g. Deshpande 2001; Anderson 2005).

This endeavour is timely for at least three reasons. First and at a general level, our analysis adds a political economy dimension, new explanations and empirical insights to the literature linking identity to economic disadvantage and its persistence. While the relationship between *urban* neighbourhoods and such persistence has received much scrutiny (e.g. Durlauf and Peyton Young 2001; Katz et al 2001) the focus has mostly been on ethnic minorities in rich economies. In contrast, we operationalise and study the relationship between the balance of power in village communities and the economic performance of historically disadvantaged social groups where high status (upper caste) groups, by maintaining traditional practices associated with this status or through other means, may impede the progress of others. Existing studies linking such performance to the village level balance of power are few and Anderson (2005) is the only comprehensive effort we are aware of.

Secondly, and pertaining to India, households from social groups recognised as historically disadvantaged continue to feature disproportionately and strongly on key indicators of rural deprivation. This is in spite of radical legislative interventions and the bold principles enshrined in India's Constitution which made reservations of government jobs and seats in legislative assemblies and educational institutions the hallmark policy to advance the prospects of individuals of so-called Scheduled Caste[2]

Coate and Loury 1993). We focus on rural India where, in contrast to urban areas, worker records in low and unskilled jobs typically are easier for employers to keep track of.

[2] Caste may refer to *jati* (sub-caste) or to the more general *varna*, the latter comprising four broad occupational groups with *Brahmins* at the top, followed by *Kshatriyas* (warriors), *Vaishyas* (traders and merchants) and *Shudras* (manual workers and craftspersons) at the bottom. SCs may be portrayed as a subset of the Shudras or as a separate category. Their main distinguishing characteristic is a particularly degrading ('polluting') traditional occupation.

(former 'untouchables') and Scheduled (indigenous) Tribe backgrounds.[3] This persistence remains a puzzle that we attempt to shed decisive new light on.

Thirdly, India's so-called 'silent revolution' manifested in the rapid increase in lower caste representation in state-level legislative assemblies (Jaffrelot 2003), suggests that a key ingredient necessary for far-reaching social change already is in place. Banerjee and Somanathan's (2007) study of parliamentary constituencies and rural infrastructure provision between 1971 and 1991 lends credence to this view since social groups that politically mobilised, namely Scheduled Castes, appear to have leaped forward relative to those that during the same period did not (Scheduled Tribes and Muslims). Further, studying mandated political reservations, Pande (2003) found SC reservations to be correlated with more job quotas while ST reservations were associated with greater expenditure on ST welfare schemes.

There is therefore, we suggest, an emerging optimism about the remedial and transformative potential of the democratic process whether on its own or aided by affirmative action in the political realm.[4]

There are two reasons to be suspicious about this optimism. The first is that the data used by others are too coarse to undertake the necessary welfare and poverty comparisons on the ground: the village infrastructure variables do not account for variation in quality while the state expenditure and other variables deployed do not, in enough depth, capture benefit incidence and the order of magnitude of improvements. The second is the analytical bypass of the political economy hurdles to social change at the village level. The taxing data requirements are a key reason for this latter neglect. With the emergence of a new, rich dataset described in detail below, this hurdle to research progress can finally be overcome.

IB. Background and contribution to the literature

'March 1949: A group of Scheduled Caste members from villages around Delhi had been thrown out of their homes by Jat landowners angered that these previously bonded servants had the cheek to take part in local elections and graze their cattle on the village commons.

June 1951: A village in Himachal Pradesh. A conference of Scheduled Castes is attacked by Rajput landlords. The SCs are beaten up with sticks, their leaders tied up with ropes and confined to a cattle pound.

[3] The criteria for Scheduled Tribe classification are (i) tribal origin; (ii) primitive ways of life and habitation in remote and less accessible areas; (iii) general backwardness in all respects (Pande 2003: 1138).
[4] Pande's (2003) is a qualified optimism. She also finds ST reservations to be associated with a decline in spending on education and a rise in overall government spending.

June 1952: A village in the Madurai district of Madras State. A SC youth asks for tea in a glass at a local shop. Tradition entitles him only to a disposable coconut shell. When he persists, he is kicked and hit on the head by caste Hindus.
June 1957: A village in the Parbani district of Madhya Bharat. Newly converted Buddhists [previously "untouchable" Hindus] refuse to flay carcasses of dead cattle. They are boycotted by the Hindu landlords, denied other work and threatened with physical reprisals.' (Guha 2007: 380-81)

More than 50 years on and in spite of the erosion of the more forbidding caste barriers[5], Scheduled Caste (SC) and Scheduled Tribe (ST) households, remain strongly overrepresented among India's rural poor, illiterate and in the former case, also the landless. While rural poverty is on the decline, these two groups, which represent 16.2 (SC) and 9.2 (ST) percent of the country's population,[6] account for as much as 47.3 percent of India's poor (Gang et al. 2008a). An additional but less sharply delineated category of disadvantaged citizens mentioned by the Constitution, Other Backward Classes (OBC), also continues to have lower living standards than the mainstream population (Gang et al. 2008b).[7] The results below suggest that the same holds for Muslims, the largest religious minority.[8]

That such identity aspects of rural disadvantage persist to the extent that they do calls into question the optimism engendered by the so-called 'silent revolution' (Jaffrelot 2003), and of SC constituencies benefiting disproportionately from public goods provision (Banerjee and Somanathan 2007). The 73rd Constitutional Amendment, implemented in April 1993 and extending the leverage of village Panchayats (councils) while stretching reservation policies to the grassroots level added further impetus to expectations raised by these developments.

Even so, Shah et al.'s (2006) recent study of untouchability, covering much of rural India, shows that SCs were prevented from full participation in local markets and often from entering village shops in 30-40 percent of the villages surveyed; in 45-50 percent of the villages covered, SCs were prevented from selling milk to village dairy cooperatives.[9] Such 'bans' could be rooted in purity and pollution ideals and the ensuing and sensitive links between a person's caste and the preparation and handling of food and water (e.g. Madsen 1991, Iversen and Raghavendra 2006).

[5] Examples from the recent past include caste demarcators in how people dressed and spoke and what they were allowed to do. In 19th Century Kerala, "*when a Namboodiri Brahmin approached, a Paraiya labourer had to cry out in advance, lest the sight of him pollute his superior*" (Guha 2007; 287). Also in Kerala and during conversations with a person of higher caste, members of lowly ranked castes were expected to use debasing words to describe themselves (Menon 1994;19). Nambissan (1996) presents historical evidence of how Scheduled Caste children, while permitted to attend school, could be denied entry to the classroom.
[6] Census of India (2001).
[7] The issue was first addressed by the Other Backward Class Commission, appointed by Prime Minister Nehru, and later and more decisively by the Mandal Commission (1978-80). The latter's recommendations, extending reservation benefits to OBCs, were declared constitutionally legitimate in 1992.
[8] Muslims account for 13.4 percent of the population (Census of India 2001).
[9] The study covered 550 villages in 11 main states.

Indeed, as is well known, SC hamlets tend to be separate from the main village and often have their own drinking water source.[10]

In this paper, we use a unique household panel data set for rural India to make detailed standard of living comparisons across social groups at two points in time – before the effects of the 1991 liberalisation reforms had started to kick in and 10 years later.[11] We exploit our access to uniquely detailed information on the largest landowning and population groups in the village in which panel households reside in order to examine two possible explanations for identity-based disadvantage in rural India.

The first, the oppression hypothesis, originates in M. N. Srinivas's theory of caste dominance[12] which portrays a caste that in addition to strong numerical presence is also economically powerful (Srinivas 1955). This oppression hypothesis corresponds with the external mechanisms linking social identity and economic welfare, is discrimination oriented and advances the view that historically disadvantaged and other marginalised social groups fare worse when resident in villages dominated by upper castes.

The second, the village enclave hypothesis, corresponds with the internal mechanisms linking identity and welfare, is theoretically ambiguous and captures a situation where a marginalised group is dominant at the village level. Upwards mobility may then be inhibited, or conversely encouraged, by factors that either wholly or in part are internal to the group in question. Munshi and Rosenzweig (2006) illustrate a negative mechanism albeit in the urban context of Mumbai, where the density of *jati* based labour market networks, via the effects on educational choice, is held responsible for slow upwards mobility among low caste, young men.[13] In a village setting, a preference for traditional occupations or social inertia (e.g. Peyton Young 2001) could have similar, 'interlocking' effects.

Empirical studies of education and labour market outcomes in (mainly immigrant) enclaves infuse more optimism about enclave potential (e.g. Edin et al 2003; Cortes 2006). A less hostile village environment could prevent the psychological internalisation of self-fulfilling, negative self beliefs that might otherwise lock individuals of marginalised backgrounds into low level equilibrium traps (Akerlof

[10] In rural Karnataka, children from orthodox Brahmin households may be forced to take a bath before entering their house after interacting with peers from 'inferior' castes during the school day.

[11] Our reference here is to India's landmark economic liberalisation programme, initiated in 1991, but with its main effects kicking in only after the first panel round (see footnote 20). In principle, although we find little support for it below, economic liberalisation or the implementation of the 73rd Constitutional Amendment, could have weakened oppressive caste relations between the two survey rounds.

[12] Apart from Anderson (2005), the caste dominance concept has been applied in economic studies by, among others, Besley, Pande and Rao (2005), Dercon and Krishnan (2007), and Do and Iyer (forthcoming).

[13] In contrast and using NSS data, Das (2008) finds evidence of successful self-employment enclaves among educated Muslim men in India.

and Kranton 2000). By reducing the social distance between parties to rural transactions, own enclaves could also, as Anderson's (2005) evidence attests to, improve the operation of vital rural markets.

In a manner to be explained precisely below, we test both the oppression and the enclave hypothesis through examining the relationship between the social identity of the groups that are economically or numerically dominant at the village level and the income of households belonging to marginalised groups. In doing so, our study advances the literature in three major ways. Firstly, aggregating across markets, as we do,[14] a small number of studies test for identity-based disadvantage in India (e.g. Kijima 2006; Gang et al. 2008a), but do not test the effects of village level upper caste or own group dominance on the economic performance of different social groups.[15] In addition, little remains known about whether and in what directions, patterns, magnitudes and causes of identity-based disadvantage may be transmuting in the post reform era.

Secondly, we broaden the remit of economic-empirical research on identity aspects of economic performance. In India, empirical research on caste has focused on discrimination, mainly within the labour market (e.g. Banerjee and Knight 1985; Kingdon 1998; Iversen and Raghavendra 2006; Thorat and Attewell 2007). The evidence suggests that individuals of SC and ST background are indeed at a disadvantage – through lower wages, a higher propensity of being stuck in dead end jobs (e.g. Banerjee and Knight 1985) or inferior employment terms, such as casual employment (e.g. Madeshwaran and Attewell 2007), although discrimination itself is hard to pin down.[16, 17]

While important, the labour market is only one market where individuals from marginalised social groups may be disadvantaged. To date, much anecdotal but little systematic knowledge exists about discrimination in credit, insurance or other key markets or particular to rural areas, markets for agricultural inputs and outputs. There is also limited rigorously obtained evidence on whether a person's caste,

[14] Our data do not permit precise identification of discrimination within a particular market or in the access to a specific public service, but facilitate instead identification of upper caste oppression and of negative or positive village enclave effects on household economic welfare, measured by income.

[15] Existing studies make use of nationally representative cross-sectional data and Blinder Oaxaca or alternative decomposition techniques to quantify the disadvantage associated with Scheduled Caste, Scheduled Tribe or religious identity (e.g. Kijima 2006; Gang et al 2008a). Using All-India data, Kijima (2006) finds that contrasting returns may account for up to 50 percent of the difference in mean consumption expenditure between SC/ST households and others. Dercon and Krishnan (2007) use the ICRISAT household panel but their analysis is limited to 204 households from six villages and two states. Lower educational attainment is reported to fully account for the slower standard of living improvements of SC/STs.

[16] As Gang et al (2008a) note, present labour market disadvantage may not reflect labour market discrimination but that cross-section analysis picks up pre-market variation in the quality of education received. Recent studies of upper end labour markets tackle such hurdles to identification at the point of labour market entry. In a field experiment covering a variety of private sector enterprises across Indian cities, Thorat and Attewell (2007) find that SCs and in particular Muslims have a significantly lower probability of being called for an interview after responding to a job ad. Banerjee et al (2009) adopt a similar design, but study call centres and software firms in Delhi and find evidence of discrimination only in the call centres.

[17] In her study of Lucknow, a city where discrimination would be expected, Kingdon (1998) finds that once an indicator of quality of education is introduced, identity coefficients in her wage equations turn insignificant.

religious or tribal identity circumscribes the access to poverty-oriented public policy programmes or public services in general.[18]

We propose that the empirical study of identity-based disadvantage in hierarchical village societies in India may best be served by a hybrid theory that in addition to power expressed through numerical presence and/or land ownership accounts for status defined by caste while stretching the analytical scope beyond the labour market.

Thirdly, we provide a major push forward of the literature that makes empirical use of sociological and anthropological notions of caste dominance. As noted, Anderson (2005) is the other main contributor to this literature. For a data-set covering 120 villages in Uttar Pradesh and Bihar, she is able to shed light on the mechanisms through which caste based disparities emerge and may be sustained. Specifically, she finds that Yadav households in villages where Yadavs are the dominant land owners have higher incomes than Yadav households in villages where the dominant land owners belong to a local upper caste. She attributes this result to the market for irrigation water's failure to operate in villages with upper caste land dominance and concludes that social distance may prevent the efficient operation of vital rural markets.

Anderson used cross-sectional data from areas which are part of India's "poverty belt" and more than elsewhere riddled by inter-caste tensions and conflict (Bayly 1999: 345). In its base year 1993/1994, our panel data set is representative for rural areas of most of India's major states (see section II). We estimate the impacts of upper caste and own group dominance on household income in two rounds; distinct from Anderson (2005) we are able to explore the implications for growth and for poverty incidence and persistence for social groups for which such effects are expected to be particularly pronounced.[19] In manners to be explained shortly, we also control extensively for potential locational confounds and distinguish externalities associated with residence in upper caste dominated villages from social group specific oppression effects within the same villages. In further contrast to Anderson (2005), we explore the pathways through which these oppression and enclave effects operate and whether the latter are transmuting in the post reform era.

[18] Exceptions include Dreze and Kingdon (2001) who find that rural Scheduled Caste children have an 'intrinsic disadvantage' and a lower chance of attending school even after household wealth, parental education and motivation and school quality are controlled for.

[19] The most pertinent focus for a study of the welfare implications of (upper) caste and own group dominance in rural India would arguably be on former untouchables (SCs). The Yadavs in Anderson's study are OBCs (Other Backward Classes) while the Scheduled Castes in our panel data set include numerous former untouchable, low status *jatis* such as *Chamars* (leatherworkers) and *Balmikis* (sweepers) in the North and *Paraiyars* in the South.

IC. Empirical strategy and main findings

Exploiting the detailed information on the social identity of panel households and dominant groups in their villages which is available at the *jati* (sub-caste) level, we classify households as being Scheduled Caste, Scheduled Tribe, Other Backward Class, Muslim, Upper Caste and villages as being population-dominated and/or land-dominated by one of these groups. For reasons to be explained, the main subsequent focus is on land dominance.

We next cross-tabulate for each social group, household income, poverty, land and education variables by village regime, and observe pronounced differences across village types and over time. For example, SCs have about the same level of income in 1993/94 in villages dominated by upper castes, villages dominated by their own group and all other villages, but experienced a massive improvement in income by 2004/05 *in their own villages only*, resulting in a decrease in the incidence of their poverty in these villages, from 52.3 to 29.7 percent.

In our main regression specification and motivated below, we rely on state dummies and indicators for agroecological zones to tackle potential locational confounds and identify separately the effect on household income of belonging to a particular social group, of belonging to a particular social group *and* living in a village dominated by upper castes, ditto but now living in a village dominated by the own group, and the effect (regardless of which group one belongs to) of one's village of residence being dominated by upper castes – and thus presumably prosperous, politically well-connected, and so forth. Our panel households are followed from 1993/1994 up to 2004/2005 which enables us to explore whether key parameters have changed over time, possibly as a result of India's momentous economic liberalisation programme, initiated in 1991 but with its main effects being felt only after the first panel round.[20]

Using estimated coefficients from this main specification, we compute counterfactual income and poverty figures and find that upper caste dominance confers a positive externality on other social groups of about 10 percent of mean income in both survey rounds. This externality is discounted by group specific 'oppression' effects for Scheduled Caste (SC) and Other Backward Classes (OBC) households, which in round 2 depress SC and OBC mean income in upper caste dominated villages by about 14 and 12 percent and raise the percentage in poverty by 6 and 5 points. Stated differently, upper caste households perform far better in their own villages and while SC and OBC households perform considerably worse than upper caste households in such villages, the net effect on SC and OBC welfare of upper caste dominance is quite small because of a positive general village effect.

[20] Neither GDP growth, growth in the services sector nor private sector investment had picked up by the time the first panel round (1993/94) had been completed. For supportive evidence as well as fuller accounts of India's growth turnaround, see Sen (2007) and Panagariya (2008).

We test and confirm robustness of our main results to how dominance is measured: whether as a zero/one variable, which we prefer for parsimony and ease of interpretation, or as the share of village land held by the dominant group, or as a dominance-adjusted Herfindahl index, designed for this purpose and capturing that if land holdings among the non-dominant groups are more fragmented, the intensity of the largest group's dominance is expected to increase.

Finally, we explore the pathways through which oppression and enclave effects manifest themselves by gradually introducing sets of variables that capture village infrastructure, household education and household land. It transpires that village infrastructure has no, education a sizeable and land the largest such effect: once all three are controlled for, virtually no oppression and enclave effects remain. To live up to its promise, and a reminder to those placing faith in the democratic process, what 'the silent revolution' eventually needs to deliver to eliminate the adverse effects of upper caste dominance is an old, familiar and tough policy recipe: redistribution of land ownership.

The paper is laid out as follows. Section II describes the data set, elaborates on the theoretical background and presents the empirical model for testing our hypotheses. Section III presents descriptive statistics on income and poverty levels and change and on education and land endowments by social group and village regime. Section IV presents the main empirical results, followed by robustness tests, and a computation of counterfactual income, growth and poverty to illustrate the order of magnitude of the oppression and enclave effects we are able to identify. Section V concludes.

II.Data, theoretical background and empirical framework

IIA. The data set

The data reported on here are derived from two large-scale household surveys that cover most of the territory of India, known as the Human Development Profile of India (HDPI) surveys. The first round, HDPI-I (1993/94), was carried out by the National Council of Applied Economic Research (NCAER) on behalf of UNDP. The second round, HDPI-II (2004/05), was carried out by NCAER on behalf of the University of Maryland. The primary purpose of the surveys was to collect detailed information on a large range of human development indicators, including income, which is the variable reported on here. These surveys are the first major ones for India to measure household income in a comprehensive and refined manner, using more than fifty separate components. A full description of the variables, summary

statistics including comparison with other major India surveys[21], and an exposition of the sampling methodology can be found in Desai et al. (2009).

A unique feature of these data is that a village questionnaire was administered in the second round in 2004/2005 and enables the construction of village social composition and land ownership distribution variables by *jati* (sub-caste). Further and similarly, the sub-division of social groups in the household questionnaires allows us, in addition to the official categories of Scheduled Castes, Scheduled Tribes, Muslims, OBCs, [22] other Hindus, and Others, to precisely identify the *jati* of individual households and thus to make comparisons of the economic performance of other social groups with that of upper-caste households, who mostly are Hindus.[23] These features depart notably from official data sets with collection of information on *jati* terminated after the 1931 Census.

The first round of the survey uses a random sample of 33,230 households located in and representative of each of the rural areas in all (then sixteen) India's major states. Initially, the aim was to re-interview 13,593 randomly selected rural households in the second round. Recontact details were, for various reasons, not available in two states and in the end 10,451 households in fourteen (plus three new) states participated in both rounds.[24] A residence-based sampling rule was adopted involving only households who had stayed in the village; migration (of the entire household) and natural demise are reasons for attrition. After removing about 20 villages with missing social composition and land ownership information, we are left with a panel comprising 9,111 households spread over 679 villages.

The findings reported here are strictly speaking valid only for households who choose not to migrate (e.g. Baulch and Hoddinott 2000; Rosenzweig 2003). However, the comparison of living standards and changes therein across social groups – the focus of this paper – should not be much affected by this limitation: the variables caste, religion, education and income are not substantially different in the panel from those in a randomly selected rural refresher sample drawn to check the round 2 representativeness of the panel household sample.[25] Furthermore, we performed a

[21] There is a close correspondence between the HDPI and other major surveys on mean values of all key variables; see Desai et al. (2009), Table 2.
[22] OBC lists, which include Muslims, are state-specific, regularly updated and rapidly expanding; entries increasingly reflect political muscle rather than past discrimination. As Appendix 1 explains, manifestly political inclusions on the official list are reclassified and omitted from the OBC category used in our analysis.
[23] See Singh's (1984) account of caste among non-Hindus and Jodhka's (2004) in-depth discussion of Sikhism and caste. Among Muslims, Fuller (1996) and other contributors to the same volume contend that while caste-like arrangements are common, few admit to their existence. See also Appendix 1.
[24] They are Andhra Pradesh, Bihar (+ Jharkand in round 2), Gujarat, Haryana, Himachal Pradesh, Kerala, Madhya Pradesh (+ Chhattisgarh in round 2), Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh (+ Uttarakhand in round 2) and West Bengal. Recontact details were largely lost in Assam due to a flood and in Karnataka because of human error.
[25] See Table 1 in Appendix in Desai et al (2009) which reports the proportions of the panel household sample in round 2 and those of the refresher sample in categories of age (8 categories), gender (2), individual education (6), social group (6), place of residence (4), maximum adult education (6), and income (6). The absolute differences between the proportions of the two samples (38 comparisons in total) range from 0.04 to 5.28 percentage points, with a mean value of 1.20 and a median of 0.56 percentage points.

statistical test on whether or not inclusion in the panel of all households who participated in the first round is associated with our independent variable in the analysis, namely household income. After controlling for households' demographic composition and educational attainment, household income is not associated with selection into the panel,[26] suggesting that the panel households in our analysis, with respect to income, are a randomly selected subsample of all rural households that participated in the first round.

IIB. Upper caste and own dominance – theory and definitions

The caste dominance concept originates in the sociological and anthropological literature. In Srinivas's (1955: 18) own words:

'*A caste may be said to be 'dominant' when it preponderates numerically over the other castes and when it wields preponderant economic and political power. A large and powerful caste group can more easily be dominant if its position in the local hierarchy is not too low*.'

Upper caste dominance is perhaps best expressed as a combination of secular power and ritual status where the latter reflects the Varna hierarchical order with Brahmins topmost among four broad occupational ranks and with former untouchables (SCs) as a separate category. The dominant social group could be defined as the group (i) which represents a larger share of the village population than any other social group (n_d); (ii) owning more village land than any other social group (l_d) (e.g. Dumont 1970); or (iii) both n_d and l_d (e.g. Srinivas 1955). While not exhaustive, (i)-(iii) represent alternative measures of secular power.

Numerical strength could translate into village level political muscle especially after the 73rd Constitutional Amendment's elevation of the status and significance of village Panchayats. However, Anderson (2005) finds no effects of population dominance on economic outcomes. As we explain below, our empirical focus on land dominance partly reflects a constraint imposed by de facto village structures in rural India but also exploratory regressions supportive of Anderson's (2005) approach and Dumont's (1970) assertion that dominance is rooted in economic power captured by landownership alone.[27]

[26] The p-value corresponding to the null hypothesis that income is not associated with panel inclusion is equal to 0.937.
[27] These results are not presented or further discussed here, but will be made available from an author website for interested readers.

Conceptually, let the land of village *j*, L_j, be distributed over m groups where n_i represents the share of the village land that belongs to social group *i*. Hence,

$$L_j = \sum_{i=1}^{m} n_i = 1 \qquad (1)$$

Definitions: *A dominant social group has the largest share of the village land of any social group. For members of the dominant social group in village j, village j is described as own group dominated or an own enclave. If the dominant social group in village j is upper caste, village j is upper caste dominated. Upper caste dominance is an example of what we call a village regime.*

This forms the conceptual backbone for our main analysis. Our preferred dominance measure is sociologically anchored and easy to interpret. However, it neglects the relative size of the dominant group's landholdings, as well as fragmentation or concentration among other social groups within a village. We therefore use two alternative dominance measures as robustness checks. The first is the share of village land owned by the dominant group, the second a modified Herfindahl index.

The Herfindahl index of concentration for village j can be defined as:

$$H_j = \sum_{i=1}^{m} n_i^2 \quad \text{where} \quad H_j \in (0,1] \qquad (2)$$

Situations such as two groups with landholdings of equal size would count as considerable concentration, but should not count as dominance. In order to equip H_j *for capturing dominance*, we introduce the following modification:

$$D_j = n_d^2 - \sum_{i \neq d} n_i^2 \qquad (3)$$

where the subscript *d* refers to the land share owned by the dominant group. For a given share of the village land owned by the dominant group, the more fragmented is the land ownership of other groups, the higher is D_j. In the example above, its value will be exactly zero, as it should be.

To construct our village level dominance measures we combine village level information on social structure and land ownership with evidence on the hierarchical status of precisely identified jatis. The village questionnaire administered in round 2 identifies the jati of the numerically dominant social group in each village, the percentage of village land this social group owns along with similar information for the next 4-8 most numerous social groups. Anthropological and other evidence on the status of different jatis is then invoked to develop a more refined upper caste definition as explained in Appendix 1. Given the general inactivity of rural land markets (Anderson 2005), and that land-dominant groups tend to hold a much larger

share of village land than any other group,[28] we assume that the village regime is identical in rounds 1 and 2.

IIC. Empirical model

Both the oppression and the enclave hypothesis refer to the extent to which the income level of households from different social groups is affected by the social identity of the dominant land owners of the village in which they reside. To statistically test these hypotheses, we model the relative differences in income by social group and village regime, controlling for location and household characteristics, as follows:

$$\begin{aligned}\ln(Y_h) = {} & \alpha_{0t} + \alpha_{1t} SC_h + \alpha_{2t} ST_h + \alpha_{3t} MUS_h + \alpha_{4t} OBC_h \\ & + \beta_{1t} SC_h \times DSC_h + \beta_{2t} ST_h \times DST_h \\ & + \beta_{3t} MUS_h \times DMUS_h + \beta_{4t} OBC_h \times DOBC_h \\ & + \gamma_{0t} DUC_h + \gamma_{1t} SC_h \times DUC_h + \gamma_{2t} ST_h \times DUC_h \\ & + \gamma_{3t} MUS_h \times DUC_h + \gamma_{4t} OBC_h \times DUC_h \\ & + \pi_t X_{ht} + \theta_h + \eta_{v(h)t} + \varepsilon_{ht}, \end{aligned} \quad (4)$$

Subscript *h* denotes households and *t* time (t={1993/1994,2004/2005}). The real per capita income of a household[29] is denoted by *Y* and the five social groups a household can belong to are denoted by *SC* (Scheduled Castes), *ST* (Scheduled Tribes), *MUS* (Muslims), *OBC* (Other Backward Classes) and *UC* (Upper Caste). These are all dummy variables and take the value 1 if a household belongs to this group and 0 otherwise. The village regime is modeled using the dummy variables *DSC*, *DST*, *DMUS*, *DOBC* and *DUC*, which take the value 1 if this particular social group is land dominant in the village in which the household lives and 0 otherwise.

The last three terms in the right hand side of equation (4) form the error structure of the model. The first two error terms are, respectively, a random household specific effect, θ_h, that is assumed to be independently distributed across households, and a random village specific effect, $\eta_{v(h)t}$, which is assumed to be independently distributed across villages. The third error term, ε_{ht}, is an idiosyncratic error term and is assumed to be independently distributed across households, villages and time. The assumption of a random household specific effect, as opposed to a fixed effect, is required since incorporating a household specific fixed effect would make it impossible to identify oppression and enclave effects since, as noted, the village regime is constant over time and a panel household lives in the same village in both

[28] Details are available from the authors.
[29] Throughout income is per capita per annum and in constant 1993/94 prices, converted using NSSO state-specific rural CPIs.

rounds. We estimate equation (4) by Least Squares for each of the two periods separately as all parameters are allowed to vary over time. Arbitrary correlation between households within a village is accounted for when calculating the standard errors (e.g. Cameron and Trivedi 2005).

The α-parameters refer to the relative income differences between households of different social groups with *UC* as reference group. For instance, the parameter α_{1t} (x100) corresponding to the variable *SC*, is interpreted as the percentage difference in income between *SC* and *UC* households (*ceteris paribus*). Similarly, the enclave hypothesis refers to the β-parameters and the parameter β_{1t} (x100) corresponding to the variable *SC*x*DSC*, is interpreted as the percentage difference in income for *SC* households living in a village dominated by their own social group. The oppression hypothesis refers to the γ-parameters. The parameter γ_0 corresponding to the variable *DUC* relates to the relative income effect for all households living in a village dominated by Upper Castes (*UC*) while the parameter γ_{1t} (x100) corresponding to the variable *SC*x*DUC* is interpreted as the percentage difference in income between *SC* and *UC* households living in a *UC* dominated village.

Without controlling for potential locational confounds, the enclave and oppression effects could simply pick up that upper caste dominated villages may be located in areas with a favorable resource base and greater agricultural potential.[30] Another possible locational confound relates to policies and governance in the state where a village is located and a household resides. While Anderson (2005) contends that land ownership and residential patterns in village India are historically determined and thus exogenous, land reforms which have fallen within the jurisdiction of individual states post independence, could have upset such historical patterns. As Besley and Burgess (2000) document, however, while state level legislation included introduction of land ceilings, de facto redistribution has, by and large, been evaded because of loopholes and the absence of political will (ibid. 394).[31] The most powerful effects on poverty are instead observed for reforms strengthening tenurial security (ibid.); the latter can be adequately dealt with by using state dummy variables as controls.[32]

To address these fundamental concerns, we use Palmer-Jones and Sen's (2003) agroecological zones[33] and state dummy variables to control for locational

[30] The relevance of locational disadvantage, which corresponds highly imperfectly with state boundaries, for poverty (and inequality) in rural India, has been extensively documented by Palmer-Jones and Sen (2003).
[31] Echoing Bardhan's (1970) assertion that redistributive reforms have not been implemented with sincerity.
[32] The general inactivity of land markets adds further support to Anderson's (2005) claim. Even so we do not and in general claim to identify causal relationships.
[33] Their map (Palmer-Jones and Sen (2003: 14-15) divides India into 19 agro-ecological zones where very careful classifications of land surface capture initial conditions that indicate agricultural productivity potential. The zones are classified by variation in soil types, rainfall patterns, altitude, whether coastal and other factors that affect this potential. Two examples can illustrate these zone definitions: zone 7: Deccan Plateau of Talangana and Eastern Ghats, hot semi-arid eco-region with red loamy soils – GP 90-150 d. zone 5: Central (Malwa) highlands, Gujarat plains and Kathiarwar peninsular, hot arid ecoregion with medium and deep black soils and GP 90-150 d.

confounds. Both sets of variables are included in the vector of control variables (X) in equation (4). In addition, X includes variables for household demographic composition, education and land holdings, and for village infrastructure (the full list of variables is in Appendix 2).

All parameters of equation (4) are allowed to vary with time which makes it possible to investigate changes in oppression and enclave effects between the two rounds and, subsequently, the implications for income growth and for poverty incidence and persistence. As discussed in section B, we explore the robustness of the main results to two alternative measures of dominance and for this purpose we replace the dummy dominance variables (e.g. *DUC*) with the upper caste land share (the first alternative) or the value of the dominance adjusted Herfindahl-index (the second alternative, eq. (3)).

III. Descriptive statistics

Anchored in Dumont's (1970) conception of caste dominance, as set out above, our empirical focus is on villages in which a particular social group owns the largest proportion of village land. The technical challenge posed by separate identification of land and population dominance may be gauged from the diagonal of Table I which shows that population and land dominance are strongly correlated: for each social group, if it is population dominant, in over 90 percent of cases, it is also land dominant, and vice versa. There are two exceptions to this pattern – in 44 villages SCs are population, but not land-dominant. There are also 39 villages where OBCs are population, but not land-dominant. We include separate terms to capture these two exceptions in our empirical analysis below. Table I shows that Upper Caste dominance is the most common village regime, closely followed by villages dominated by OBCs. In comparison, the number of SC and Muslim dominated villages is relatively small.

Table II reports the distribution of panel households across village regimes and illustrates the extent to which panel households are clustered in 'own' dominated villages. Such clustering, which can be read off the bold diagonal, is pronounced for STs, UCs, OBCs and Muslims while the SC population is more dispersed. Relevant to the oppression hypothesis, table II also shows the presence of panel households from each social group in UC-dominated villages. 45.9 percent of the panel households residing in such villages are UCs, 26.4 percent SCs and 21.6 percent OBCs. STs and Muslims between them account for 6.1 percent.

Table I: Number of land and population dominated villages by social group

	Largest land-holding group in village						
	SC	ST	OBC	MUS	UC	OTH	Total
Largest population group in village:							
Scheduled Castes (SC)	**24**	2	12	1	25	4	68
Scheduled Tribes (ST)	0	**65**	3	0	2	0	70
Other Backward Classes (OBC)	1	0	**196**	3	25	10	235
Muslims (MUS)	0	0	2	**35**	4	2	43
Upper Castes (UC)	0	1	1	0	**223**	6	231
Others and none (OTH)	2	0	8	0	18	**1**	9
Total	27	68	222	39	297	26	**679**

Source: HDPI panel, authors' calculations
Notes: Figures are number of panel villages in which the row social groups are the largest population group and the column social groups own the largest land share. The category "others" consists of villages in which either an unclassified group or no single group is land- or population-dominant.

Table II: Number of panel households by social group and village regime

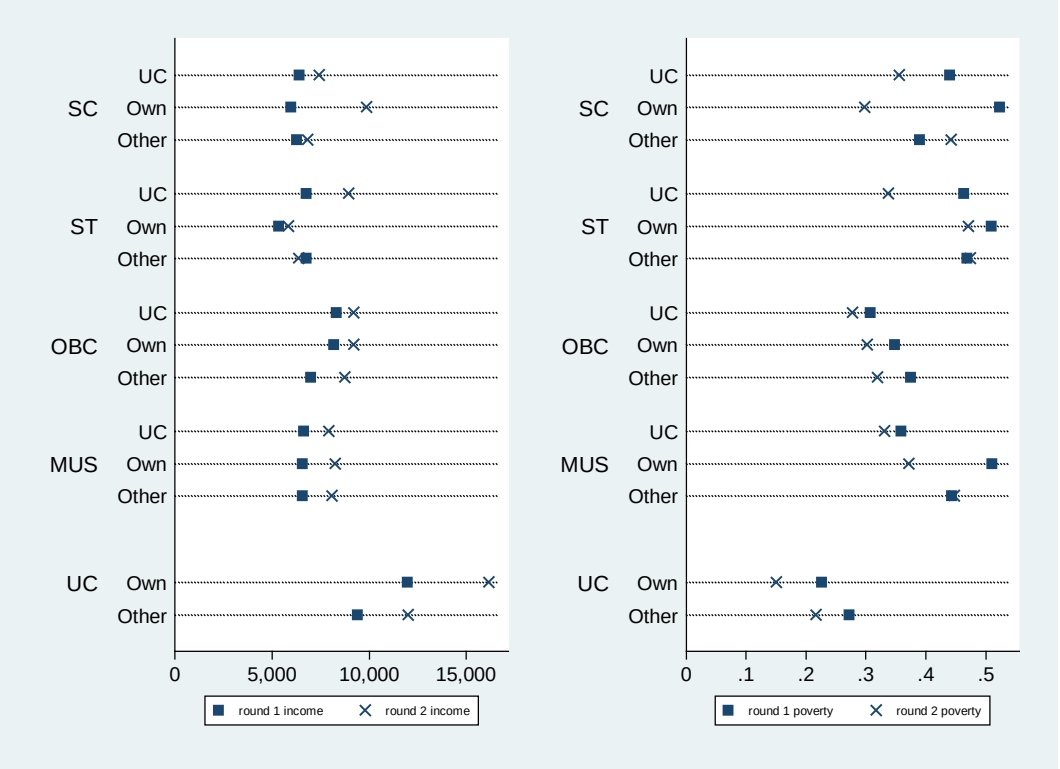
	Land dominant social group						
	SC	ST	OBC	MUS	UC	OTH	Total
Social group of panel households:							
Scheduled Castes (SC)	**222**	68	694	109	1,040	119	2,252
Scheduled Tribes (ST)	23	**552**	141	21	95	3	835
Other Backward Classes (OBC)	86	169	**1,608**	64	852	130	2,909
Muslims (MUS)	52	10	130	**337**	145	25	699
Upper Castes (UC)	44	61	381	29	**1,810**	91	2,416
Total	427	860	2,954	560	3,942	368	9,111

Source: HDPI panel, authors' calculations

We next present descriptive statistics on village regimes that are pertinent to the oppression and enclave hypotheses.[34] Figure 1 reports round 1 and round 2 mean household per capita incomes and poverty headcount by social groups for villages with (i) upper caste land dominance, (ii) own group land dominance and (iii) the remaining 'other' villages. Unsurprisingly, in the aggregate, SCs and STs are on average worse off than OBCs and Muslims, who are in turn poorer than UCs, which is true in both rounds and whether measured by income or the incidence of poverty. However, a more nuanced picture is obtained when we compare living standards by social group across village regimes.

[34] In a companion paper, we present other descriptive statistics for this panel including mean household income by state, land holdings, levels of education (of the household head), occupation and real household income per capita for different social groups and find a close correspondence between a priori expectations and summary statistics. Marginalised social groups own less land and are less educated than others. 41% of SC households and 48 % of Muslim households have their own land; the figures for STs, OBC and UCs are 70%, 63% and 81%, respectively. Apart from lower levels of education and consistent with Kijima (2006), marginalised communities also appear to receive lower returns on their human capital.

Figure 1: Mean per capita household income (in 1993/94 Rupees) and poverty headcount (proportion) by social group, round and village regime



Source: HDPI panel, authors' calculations
Notes: Poverty is the share of the indicated sub-sample with income below the NSSO state-specific rural poverty lines.

Figure 1 suggests pronounced village regime effects on income levels, growth, poverty incidence and the speed of poverty reduction (or conversely, poverty persistence). In round 1, SCs and OBCs in upper caste dominated villages have marginally higher average incomes. For STs, round 1 incomes outside own enclaves were notably higher. [35] The average upper caste household was much better off in own enclaves, while Muslim incomes were roughly equivalent across village regimes. In terms of how income by social group ranks across village regimes, the second round picture is broadly similar to that of the first round for OBCs, Muslims and UCs but strikingly different for STs and SCs: STs in round 2 appear to do much better in UC dominated villages while SCs fared much better in own enclaves.

In terms of average living standard improvements, enclaves appear to favour UCs and SCs very strongly and Muslims marginally; STs did remarkably well in UC dominated villages, but made little progress overall. Contrasting this dynamism, SCs and OBCs in upper caste dominated villages and STs and OBCs in own enclaves experienced little progress between rounds.

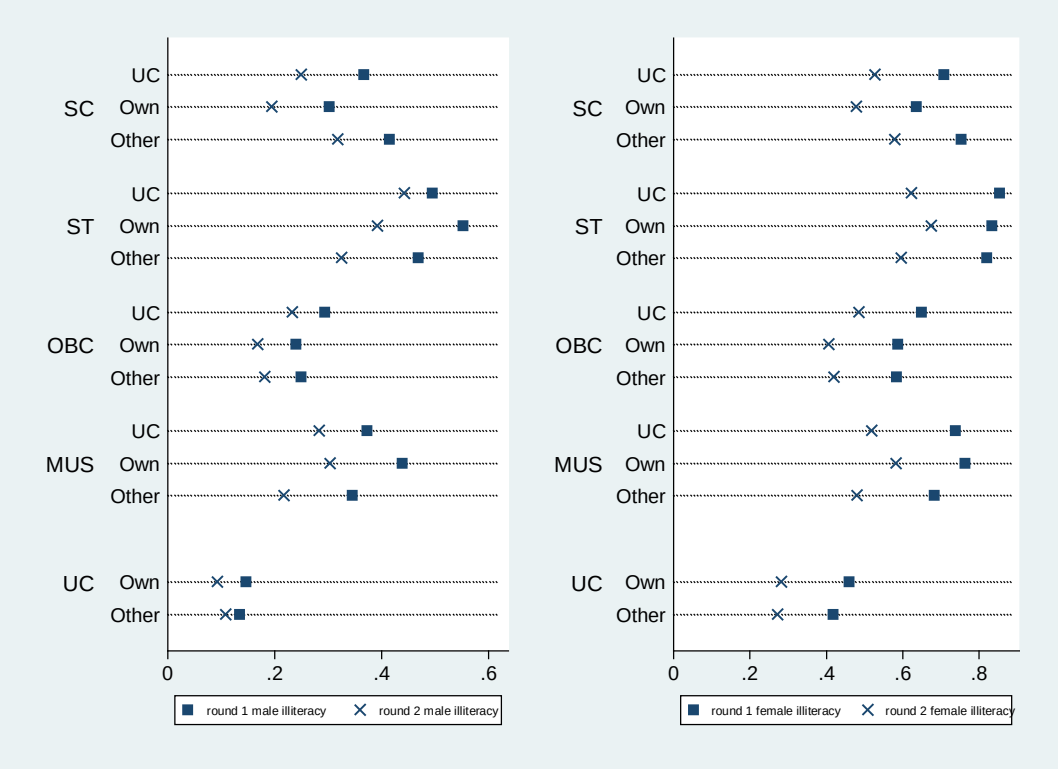
[35] Kijima (2006;370) holds unfavourable geographic location responsible for disparities between STs and other social groups. Banerjee and Somanathan (2007) observe that areas with a high ST population have less rural infrastructure, e.g. roads, health and educational facilities.

Were these average income changes confined to the better off within each social group or did they include poorer households as well? In the first round, the incidence of poverty among SCs, STs, OBCs and Muslims was lower in upper caste dominated villages than in own enclaves. Consistent with the income growth observations, the most dramatic poverty reductions appear for SCs in own enclaves and STs in upper caste dominated villages. However, in spite of modest income rises, poverty reduction among Muslims in own enclaves appears dramatic. Poorer ST households made slightly more progress than the average ST household. Consistent with the income figures, OBCs seem to have experienced limited poverty reduction between the two rounds.

In the empirical section below and after controlling for potential locational confounds and household composition, we incrementally control for household factor endowments, in order to obtain clues about the pathways through which the village regime effects on income and poverty of different social groups operate. For example, SCs living in own enclaves might do better because of larger or higher quality land holdings which directly or via more education could translate into higher incomes. If so, enclave coefficients should turn insignificant once education and household land holdings are controlled for. Figures 2 and 3 illustrate how social identity interacted with village regime relate to two important factor endowments in rural India, namely basic education measured by male and female illiteracy and household land holdings.

For both male and female literacy, SCs and OBCs do better in their own enclaves than in UC-dominated villages and Muslims worse, in both survey rounds. No such clear pattern is discernible for STs. Among groups with low initial male literacy (SCs, STs, Muslims), there appears to have been across the board improvements with Muslims and STs in own enclaves progressing more than those in UC dominated villages. SCs had higher and Muslims lower initial male literacy in their own enclaves. Although these observations on educational levels and progress correspond imperfectly with the income and growth patterns in Figure 1, they do provide hints of positive enclave level and growth effects for SCs. While STs in UC dominated villages experienced rapid income growth, male education does not appear to be responsible for this spur. Female STs experienced dramatic educational progress in general, while female SCs did better and female Muslims worse in own enclaves.

Figure 2: Male and female illiteracy by social group, round and village regime



Source: HDPI panel, authors' calculations

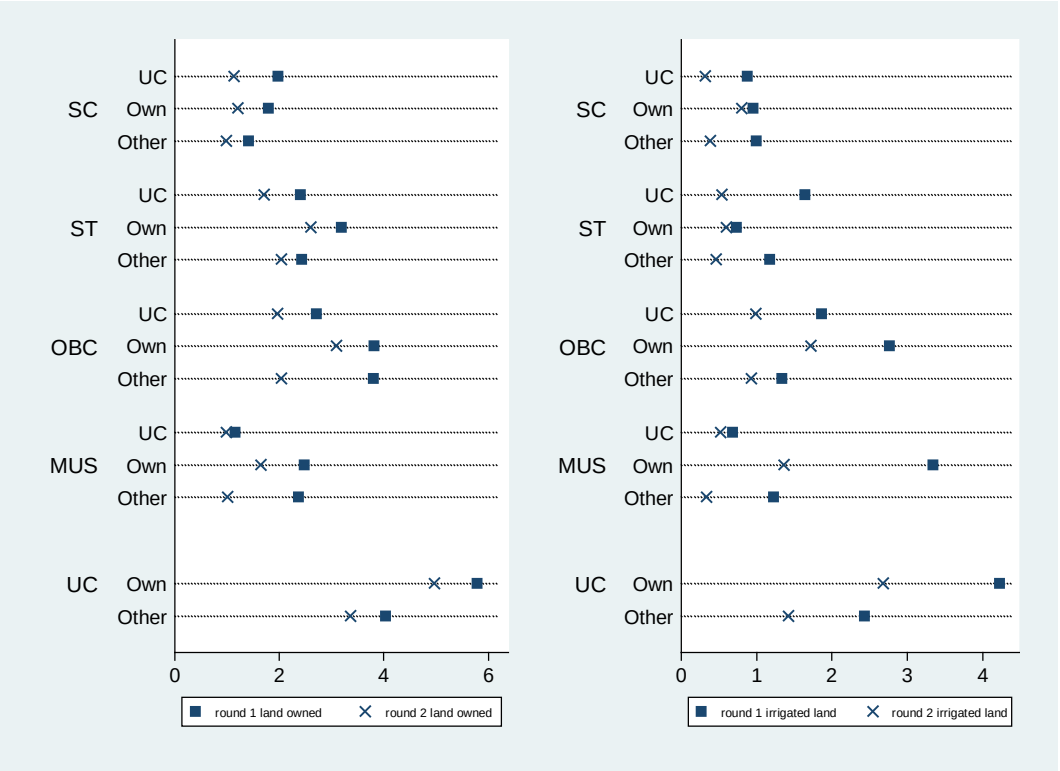
Notes:

Figures are averaged across all *households* in the sub-sample indicated, and are based on the highest level of educational achievement in the household, i.e. on households of which not a single (female or male, as appropriate) member is literate.

An a priori expectation of higher average round 1 land holdings in own dominated villages holds for UCs, STs and Muslims (marginally). The average SC household in UC dominated villages possessed more land than own enclave SC households only in round 1. OBCs in UC dominated villages owned less land than in own enclaves but more land than SCs in UC dominated villages. Consistent with expectations, the overall distribution of land holdings shows UCs as the largest landowners followed by OBCs, STs, Muslims (except in UC dominated villages) and SCs. Patterns are much the same, although with more pronounced differences, for irrigated land.[36]

[36] The consistent decline in land holdings, given that we are dealing with a panel, may look puzzling. Further disaggregation confirms this trend across states, suggesting that this is a real phenomenon. The most likely explanation is that in a sufficient number of first round households to affect mean values, elderly patriarchs resided in joint households with the oldest son (and this son's wife and offspring). In the intermediate period, some of these patriarchs died – while the oldest son's household remained intact, its land holdings was split among the oldest son and his siblings.

Figure 3: Mean land holding (in acres) by social group, round and village regime



Source: HDPI panel, authors' calculations
Notes:

1. All figures are in acres and averaged across the entire sub-sample indicated, i.e. including those who do not own/hold any land.
2. Irrigated land includes owned and hired land (we cannot distinguish the two)

To sum up, in terms of the level of income and poverty in both rounds, as well as income growth and poverty reduction, UCs and STs do on average better in UC-dominated villages than anywhere else. By contrast, whereas SCs in their own enclaves do not, on average, outperform SCs elsewhere in terms of income and poverty in round 1, they do so and very strongly in round 2. Excepting poverty reduction (but not mean income growth) of Muslims in their own enclaves, there are no striking differences across village regimes for Muslims and OBCs. Some factor endowments – most notably SC literacy rates in SC-dominated and UC mean land holding in UC-dominated villages – are consistent with these patterns, but generally speaking our observations so far are inconclusive about the effects of village regimes on household income, income growth and poverty incidence and persistence and about the pathways along which these effects come about. We next implement the empirical strategy laid out in section II.

IV. Empirical results

IVA. Estimation results

Eq. (4) is estimated for round 1 and 2 using alternative specifications where extra variables are gradually introduced. The estimation results for these specifications are reported in Tables III and IV and in full in Appendix 2. The natural logarithm of real household income per capita is the dependent variable.

The first specification is a simple benchmark which contains 'raw' social identity dummy variables (SC, ST, MUS, OBC) with upper castes as benchmark category. We proceed by adding the enclave village regime variables capturing own group land dominance (SCxDSC, STxDST, MUSxDMUS and OBCxDOBC), the two population (but not land) dominance dummy variables discussed in section III that we denote by SCxPSC and OBCxPOBC, the dummy for demarcating villages with upper caste land dominance (DUC) and, finally, the oppression variables represented by the social group interaction terms with upper caste dominance (SCxDUC,STxDUC, MUSxDUC and OBCxDUC). These latter interactions facilitate identification of how SCs, Muslims and OBCs perform within upper caste dominated villages compared to elsewhere.

Sets of related control variables are then gradually introduced: we think of agro-ecological zone indicators, state dummy variables and household composition variables as 'pure' controls which are added in the specifications reported on in Table III; village infrastructure, household education and land variables we think of as possible pathways through which enclave and oppression effects operate; these are added in the specifications reported on in Table IV. The full details are available in Appendix 2.

Table III Estimation results of the effects on income of social identity, village regime and locational and demographic controls

Model:	Social identity terms (1)		Plus village regime (2)		Plus controls (3)	
	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2
Social identity:						
HH is SC	-0.463***	-0.607***	-0.374***	-0.510***	-0.370***	-0.455***
	(-20.29)	(-24.75)	(-9.40)	(-11.91)	(-9.55)	(-11.18)
HH is ST	-0.458***	-0.601***	-0.310***	-0.462***	-0.309***	-0.374***
	(-12.80)	(-16.30)	(-4.57)	(-6.95)	(-4.92)	(-6.23)
HH is OBC	-0.267***	-0.371***	-0.291***	-0.338***	-0.216***	-0.264***
	(-11.40)	(-14.92)	(-5.87)	(-6.09)	(-4.59)	(-5.16)
HH is MUS	-0.406***	-0.530***	-0.289***	-0.446***	-0.201***	-0.324***
	(-10.81)	(-12.73)	(-4.76)	(-6.68)	(-3.35)	(-5.14)
Village regime variables:						
SC x DSC			0.032	0.268***	0.140**	0.302***
			(0.48)	(3.55)	(2.18)	(4.25)
SC x PSC			-0.031	0.062	-0.048	0.074
			(-0.59)	(1.08)	(-0.97)	(1.43)
ST x DST			-0.088	-0.056	-0.017	-0.001
			(-1.22)	(-0.78)	(-0.26)	(-0.01)
OBC x DOBC			0.170***	0.142***	0.098**	0.118***
			(3.58)	(2.73)	(2.21)	(2.56)
OBC x POBC			0.000	0.156**	-0.053	0.129**
			(0.01)	(2.30)	(-0.91)	(2.13)
MUS x DMUS			-0.023	0.160*	-0.015	0.122
			(-0.28)	(1.85)	(-0.20)	(1.58)
DUC			0.202***	0.285***	0.109***	0.107***
			(4.20)	(5.67)	(2.32)	(2.32)
SC x DUC			-0.113***	-0.149***	-0.082*	-0.135***
			(-2.30)	(-2.83)	(-1.75)	(-2.72)
ST x DUC			-0.222**	-0.030	-0.132	-0.007
			(-2.02)	(-0.27)	(-1.27)	(-0.07)
MUS x DUC			-0.187**	-0.142	-0.147*	-0.079
			(-2.11)	(-1.41)	(-1.75)	(-0.84)
OBC x DUC			-0.024	-0.127**	-0.078	-0.116*
			(-0.41)	(-1.99)	(-1.41)	(-1.95)
Controls:						
Household composition	No	No	No	No	Yes	Yes
Agro-ecological zones	No	No	No	No	Yes	Yes
State dummy variables	No	No	No	No	Yes	Yes
R squared (overall)	0.0609	0.0949	0.0663	0.1065	0.2127	0.2837
N	9111	9111	9111	9111	9111	9111

Source: HDPI-I ("round 1") and II ("round 2") surveys, panel households only; authors' calculations. Notes: Dependent variable is the natural logarithm of annual per capita household income in constant 1993/94 prices, with round 2 figures converted using NSSO state-specific rural CPIs. Random effects, with standard errors that are robust to heteroskedasticity and clustering within villages. ***, ** and * denote significance at 1, 5 and 10 percent respectively; robust t-statistics are in parentheses. Demographic controls are the sex of the household head, number of boys aged 0-5, girls 0-5, boys 6-14, males 15-19, females 15-19, males 20-24, females 20-24, males 25-49, females 25-49, males 50-59, females 50-59, males 60 and older, and females 60 and older. See table A2.1 in Appendix 2 for the full specification.

Table III is laid out to facilitate round 1 and round 2 comparisons. We first report broad patterns of identity-based disparities highlighting changes between round 1 and 2. We then briefly discuss the enclave and oppression coefficients before and after introducing locational and demographic controls. We finally focus on the latter enclave and oppression effects and the pathways through which they operate.

Column 1 presents the relative magnitude of the raw social identity coefficients for SC, ST, MUS and OBC households, which are all significant at the 1 percent level. In both rounds, SCs and STs are, on average, the relatively most disadvantaged, having incomes compared to UCs that are about 46 percent lower in round 1 and 60 percent lower in round 2. Muslims are slightly better off with, on average, a 41 percent lower income in round 1 and a 53 percent lower income in round 2 than UCs, while OBCs, on average, are well ahead of the other three groups. On average, OBCs have a 27 percent lower income in round 1 and a 37 percent lower income in round 2 than UCs. Upper caste households are, in general, and as expected, much better off than everyone else. The raw coefficients also suggest that the disparity between upper castes and each of the other social groups widened between the two rounds.

In columns (2) and (3) the village regime variables interacted with households' social group are introduced, first without and then with control variables added. Prior to adding agroecological, state and household demographic controls, it appears that residing in an upper caste dominated village not only benefits upper caste households but bestows sizeable positive externalities on other social groups. The coefficient corresponding to DUC, which is statistically significant at the 1 percent level, leaps notably in size between the two rounds, but only before controls are added. We also observe negative and statistically significant round 1 interaction terms ('oppression coefficients') for SCs, STs and Muslims; the oppression effect disappears for STs and Muslims and becomes significant for OBCs in round 2.

For SCs we find a large and strongly significant positive enclave effect in round 2. The round 2 enclave effect for Muslims is weaker. In addition, significant enclave coefficients for OBCs appear in both rounds. [37]

As noted above, the ways in which social identity appears to interact with village regime, and the variations in welfare levels and changes by social group that this results in, may not reflect oppression and enclave effects but instead be locationally confounded. UC dominated villages could be clustered in areas with greater agricultural potential and SC dominated villages in states with more progressive policies towards Scheduled Castes or in states that experienced more (or less) income growth and poverty reduction after the 1991 reforms; the locational disadvantage of ST dominated villages was remarked upon above.

[37] The responses of the 'raw' identity and village regime coefficients to the step-wise introduction of each of the three sets of 'pure' controls may be gauged in full in table A2.1 in Appendix 2.

Introducing Palmer-Jones and Sen's (2003) agroecological zone indicators shows that the positive externality associated with residing in an upper caste dominated village does have a locational dimension. While remaining strongly significant, coefficient sizes are sharply reduced. Adding state dummy variables further reduces size and eliminates the gap between round 1 and 2: a positive upper caste dominated village effect on mean income of about 10 per cent, independent of the household's social group, remains. This could reflect a superior quality of schools, health care and sanitation in UC dominated villages;[38] alternatively, lower castes may emulate upper caste behaviour which could strengthen educational aspirations and improve farming practices; having rich neighbours can make it less risky to adopt high yielding seed varieties since one can absorb the good and bad experiences of wealthy early adopters (e.g. Foster and Rosenzweig 1995).

Such positive externalities could exist alongside oppression effects manifested in limitations in the access to resources or markets, a hostile school environment, exclusion from membership in the local dairy cooperative or restrictions in the access to local credit or microcredit schemes that facilitate taking advantage of new post reform opportunities. Indeed, and with one notable exception (the coefficient for STs in UC dominated villages drops out), both the size and statistical significance of the oppression effects remain intact after household composition, agro-ecology and state are controlled for. At the same time, it is evident that the main enclave coefficients are not locationally confounded. OBCs do better in their own enclaves in both rounds, while SCs do far better in their own enclaves in both rounds but especially in round 2. However, the weaker round 2 enclave effect for Muslims turns insignificant.

The precise implications of the positive externality and of the oppression and enclave effects for income levels, growth, poverty incidence and poverty persistence are illustrated in the computations and discussions of counterfactual income, growth and poverty in subsection C below.

These, our main results, may be qualitatively summarised as follows. UCs earn higher incomes than others in both rounds. In addition, UCs in own dominated villages perform better than other UCs. There is, moreover, a general and strong positive externality associated with residence in upper caste dominated villages. The coefficient on DUC is significant at the 1 percent level and of similar size in round 1 and 2. Turning to the oppression coefficients, we observe that while Muslims and SCs fared worse in UC dominated villages in round 1, SC disadvantage intensified while Muslims progressed within such villages in round 2. OBCs in UC dominated villages were also at a disadvantage in round 2, but less so than SCs. Further, OBCs and, in particular, SCs do far better in own dominated villages in both rounds, but with the enclave effect in SC-dominated villages leaping dramatically in the post

[38] Banerjee and Somanathan (2007) find that parliamentary constituencies with a concentration of Brahmins had better access to schools and piped water in 1971.

reform era. Overall, our results suggest more pronounced disadvantage for SCs and OBCs in upper caste dominated villages and stronger enclave effects for SCs in round 2. One possible explanation is that it is in enclaves, where discrimination by powerful groups is less likely, that marginalised groups faced fewer obstacles in the access to markets and other opportunities and that such access gained in importance in the post reform era.

We next consider the pathways through which oppression and enclave effects operate and possible change between the rounds. We gradually control for village infrastructure, for household education and household land holdings with results reported in full in table IV.

Table IV Estimation results of the effects on income of social identity, village regime and additional controls: village infrastructure, household education and land

Controls added:	Village infrastructure		Plus education (hh)		Plus land (hh)	
	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2
Social identity:						
HH is SC	-0.369***	-0.452***	-0.245***	-0.321***	-0.154***	-0.252***
	(-9.56)	(-11.07)	(-6.58)	(-8.23)	(-4.49)	(-6.81)
HH is ST	-0.311***	-0.374***	-0.172***	-0.234***	-0.152***	-0.203***
	(-4.95)	(-6.17)	(-2.81)	(-4.09)	(-2.72)	(-3.64)
HH is OBC	-0.21***	-0.259***	-0.141***	-0.181***	-0.129***	-0.148***
	(-4.45)	(-5.05)	(-3.08)	(-3.70)	(-3.12)	(-3.25)
HH is MUS	-0.208***	-0.324***	-0.113**	-0.217***	-0.065	-0.140***
	(-3.48)	(-5.12)	(-1.98)	(-3.59)	(1.23)	(-2.38)
Village regime:						
SC x DSC	0.131**	0.289***	0.123**	0.253***	0.06	0.205***
	(2.05)	(4.03)	(2.01)	(3.64)	(1.05)	(3.16)
SC x PSC	-0.035	0.076	-0.053	0.07	-0.062	0.059
	(-0.72)	(1.44)	(1.08)	(1.39)	(1.34)	(1.23)
ST x DST	0.008	0.019	-0.006	0.005	0.012	-0.012
	(0.12)	(0.31)	(0.10)	(0.08)	(0.22)	(0.22)
OBC x DOBC	0.095**	0.115***	0.094**	0.097**	0.067*	0.05
	(2.15)	(2.49)	(2.16)	(2.19)	(1.73)	(1.21)
OBC x POBC	-0.059	0.134**	-0.044	0.118*	-0.012	0.106**
	(-1.00)	(2.20)	(-0.77)	(1.98)	(-0.23)	(1.98)
MUS x DMUS	0.003	0.147*	0.006	0.15**	-0.048	0.087
	(0.04)	(1.88)	(0.08)	(2.01)	(-0.73)	(1.21)
DUC	0.116***	0.107**	0.124***	0.105***	0.035	0.024
	(2.48)	(2.30)	(2.76)	(2.36)	(0.89)	(0.57)
SC x DUC	-0.09*	-0.14***	-0.107***	-0.15***	0.01	-0.045
	(-1.92)	(-2.81)	(-2.39)	(-3.17)	(0.24)	(-1.01)
ST x DUC	-0.14	-0.01	-0.129	0.017	-0.032	0.112
	(-1.35)	(-0.10)	(-1.27)	(0.18)	(-0.36)	(1.26)
MUS x DUC	-0.15*	-0.094	-0.129	-0.054	0.026	0.003
	(-1.79)	(-0.99)	(-1.58)	(-0.58)	(0.34)	(0.03)
OBC x DUC	-0.091	-0.123**	-0.085	-0.113**	0.076	0.001
	(-1.64)	(-2.07)	(-1.59)	(-1.99)	(1.59)	(0.01)
Controls:						
Household composition	Yes	Yes	Yes	Yes	Yes	Yes
Agro-ecological zones	Yes	Yes	Yes	Yes	Yes	Yes
State dummies	Yes	Yes	Yes	Yes	Yes	Yes
Village infrastructure	Yes	Yes	Yes	Yes	Yes	Yes
Household education	No	No	Yes	Yes	Yes	Yes
Household land	No	No	No	No	Yes	Yes
R squared (overall)	0.2252	0.2877	0.2700	0.3413	0.4258	0.4181
N	9111	9111	9111	9111	9111	9111

Source and Notes: as for Table III.

Additional notes: Education variables are dummy variables used as controls for the highest level of male and female education in the household. Land refers to controls for the logarithm of owned household land measured in acres, and the logarithm of irrigated household land measured in acres. Village size is captured by village population (logarithm). The village infrastructure controls are the presence within the village of a busstop (1), or within its vicinity of a railway station (2), medical clinic (3), schools, and if so, at which level of education (4), or a market/mandi (5), as well as the type of road (footpath only, kutcha road, pucca road) that leads to the village (6). The full specification is reported in table A2.2 in Appendix 2.

Adding the village infrastructure controls detailed in the note to table IV has a proximate negligible effect both on the raw identity and village regime coefficients. On the face of it and contrary to received wisdom (e.g Binstrup Andersen and Shimokawa 2006), the scope for reducing identity based disadvantage by improving village infrastructure appears more limited than expected. It is, however, possible that upper caste land dominance is correlated with better quality village infrastructure and that one reason for why village infrastructure variables perform so badly elsewhere reflects this quality difference.

Following Kijima (2006) we introduce dummies for the maximum female and male education within a household where the educational categories are up to primary, middle, matriculation, higher secondary and graduate plus. A hypothesis resonating with Dercon and Krishnan's (2007) findings would be that social identity disparities – by caste, religion or tribe – should evaporate once educational attainments are controlled for. For both rounds, we observe a marked reduction in the raw identity coefficients and thus in the relative disadvantage of SCs, STs, Muslims and OBCs from adding educational controls. For STs, the raw coefficient drops from -0.31 to -0.17 or by around 45 per cent. For SCs, in comparison, education nets out about 33 percent of the remaining disadvantage vis-à-vis upper caste households. Our results concur with Dercon and Krishnan (2007) in suggesting that education is crucial: it is also evident that education is only part of the solution.

Turning to the oppression and enclave effects, these are either not affected or marginally reinforced by controlling for household education, with the exception of turning a weak round 1 oppression coefficient for Muslims insignificant, and in sharp contrast with the reduction in size of the raw identity coefficients. This contrast suggests a more limited 'empowering' potential of education in upper caste dominated villages compared to elsewhere.

We next consider land holdings as potential oppression buffer and asset that may bolster enclave advantage. In contrast to Dercon and Krishnan (2007), land appears to hold the key to eliminating oppression associated with upper caste dominance. Once household land is controlled for, the positive village externality and all identity specific oppression effects are wiped out in both rounds; the positive externality from residing in upper caste villages thus accrues to landholding households. Further, what one may think of as the 'traditional' and *additional* burden imposed on SC and OBC households from residing in upper caste dominated villages could, both past and post reform, be eliminated through land redistribution. Land reform would thus wipe out the *separate* effect on income of upper caste oppression, leaving no residual effect of such oppression in any market. This does not imply that all identity based rural disadvantage will vanish, since the raw coefficients, excepting Muslims in round 1, remain stubborn and statistically significant. Hence, even after location, demography, village infrastructure and key factor endowments are carefully

controlled for, the raw coefficients suggest that SCs with the same resource base and attributes as others not only remain the worst off but fell further behind STs and OBCs in the post reform years. The main exception is SCs residing in own enclaves; the SC enclave coefficient remains large and strongly significant even after land holdings and all other controls are added and is large enough to eliminate 80 percent of the remaining disadvantage vis-à-vis UC households. Notice that Muslims have also experienced a relative post-reform setback since the raw coefficient reappears as (strongly) significant in round 2.

IV.B Robustness tests

As discussed in section II, we conduct two robustness tests on our main results by replacing the dummy variables for upper caste and own group land dominance firstly with the share of village land owned by the dominant group and secondly with the fragmentation adjusted dominance measure defined by equation (3). Table V reports the sign and the level of significance on the oppression and enclave parameters in the specification with 'pure' control variables only (AEZs, state dummy variables and household demographic controls). [39]

The round 1 results for these alternative specifications are in the top half and the round 2 results in the bottom half of Table V. 17 out of the 22 coefficients (11 per round) on the village regime variables when using the land dominance dummy are robust in terms of retaining sign and statistical significance (or insignificance, as the case may be) regardless of the dominance measure used.[40] It is also noteworthy that significance of coefficients is generally stronger for the more refined dominance measures, especially for those capturing oppression.

Exploiting the panel dimension of our dataset, we also investigated whether changes in coefficients on village regime variables between rounds were statistically significant, for each of the specifications reported in Tables III and IV and Appendix 2, and then each time for each of our three dominance measures, in regressions of the change in the natural logarithm of real per capita income on these variables and the appropriate set of controls. The intensifying enclave effect for SCs is statistically significant, for each dominance measure, and that for OBCs and Muslims only when we use the more refined measures. Changes in oppression coefficients are generally not significant which is consistent with our main results for STs in UC dominated villages and SCs in UC dominated villages. For the latter, non-significance in the

[39] We also ran regressions using alternative dominance measures for each specification reported on in Tables III and IV and Appendix 2, and obtained very similar results in terms of broad comparability with specifications using our main dominance measure to those reported here. These additional results are all available on request.

[40] The five coefficients that do not retain either (in)significance or their sign are ST x DST in round 2, OBC x DOBC in round 1, MUS x DMUS in round 2, ST x DUC in round 1 and OBC x DUC in round 1.

growth regression is the equivalent of no change in the level oppression coefficient between the two rounds.

Table V: Qualitative summary of robustness tests

Main dominance measure:	Main dominance measure results	Land percentage of largest land holding group in village	Dominance-adjusted Herfindahl index (eq. 3)
Round 1			
SC x DSC	++	+++	++
SC x PSC	Ns	Ns	Ns
ST x DST	Ns	Ns	Ns
OBC x DOBC	++	Ns	Ns
OBC x POBC	Ns	Ns	Ns
MUS x DMUS	Ns	Ns	Ns
DUC	+++	+++	+++
SC x DUC	-	---	---
ST x DUC	Ns	-	-
MUS x DUC	-	---	--
OBC x DUC	Ns	---	---
Round 2			
SC x DSC	+++	+++	+++
SC x PSC	Ns	Ns	Ns
ST x DST	Ns	Ns	--
OBC x DOBC	+++	+++	+++
OBC x POBC	++	++	+
MUS x DMUS	Ns	+	+
DUC	+++	+++	+++
SC x DUC	---	---	---
ST x DUC	Ns	Ns	Ns
MUS x DUC	Ns	Ns	Ns
OBC x DUC	--	-	---

Notes: +++, ++, + indicates positive coefficient significant at 1, 5 and 10% respectively, ---, --, - indicates negative coefficient significant at 1, 5 and 10% respectively, Ns indicates not significant, all in the specification with social group, village regime, agro-ecological zones, state dummies and household demographic composition variables.

IV.C Magnitude of enclave and oppression effects

We next explore the order of magnitude of the enclave and oppression effects in terms of income, income growth, and the incidence and persistence of poverty. We do so by computing counterfactual income as if the significant coefficients on the social identity times village regime variables were equal to zero and use the coefficients from our model that includes AEZ, state dummies and household demographic controls, i.e. the model with pure controls only.

Table VI: Actual and counterfactual income, growth and poverty without village regime effects by social group

	Scheduled Castes		**Scheduled Tribes**		**Other Backward Classes**		**Muslims**	
	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2
Upper-caste dominated villages								
Mean income per capita								
Actual	6,395	7,391	6,760	8,905	8,309	9,200	6,626	7,915
Counterfactual – without general village regime effect	5,735	6,641	6,062	8,002	7,451	8,266	5,942	7,112
Counterfactual – without oppression effect	6,941	8,460	6,760	8,905	8,309	10,331	7,675	7,915
Counterfactual – without general village regime and oppression effects	6,225	7,601	6,062	8,002	7,451	9,283	6,883	7,112
Growth in mean income per capita (% per year between 1994 and 2005)								
Actual	-	1.3	-	2.5	-	0.9	-	1.6
Counterfactual – without general village regime effect	-	1.3	-	2.6	-	0.9	-	1.6
Counterfactual – without oppression effect	-	1.8	-	2.5	-	2.0	-	0.3
Counterfactual – without general village regime and oppression effects	-	1.8	-	2.6	-	2.0	-	0.3
Poverty headcount (%)								
Actual	43.9	35.4	46.3	33.7	30.8	27.7	35.9	33.1
Counterfactual – without general village regime effect	49.9	42.0	51.6	41.1	35.8	32.4	44.8	40.0
Counterfactual – without oppression effect	38.7	29.9	46.3	33.7	30.8	22.9	29.0	33.1
Counterfactual – without general village regime and oppression effects	45.7	34.3	51.6	41.1	35.8	27.5	33.1	40.0
Own-group dominated villages								
Mean income per capita								
Actual	5,954	9,842	5,331	5,805	8,158	9,187	6,553	8,231
Counterfactual – without enclave effect	5,176	7,276	5,331	5,805	7,397	8,164	6,553	8,231
Growth in mean income per capita (% per year between 1994 and 2005)								
Actual	-	4.7	-	0.8	-	1.1	-	2.1
Counterfactual – without enclave effect	-	3.1	-	0.8	-	0.9	-	2.1
Poverty headcount (%)								
Actual	52.3	29.7	50.9	47.1	34.8	30.2	51.0	37.1
Counterfactual – without enclave effect	59.9	47.7	50.9	47.1	39.9	37.7	51.0	37.1

Notes: counterfactual figures are all based on counterfactual income computed for each household in villages land dominated by indicated group, using significant coefficients from the round 1 and round 2 regressions of the natural logarithm of income on village regime and social identity variables, controlling for agro-ecological zones, state dummies, and household demographic characteristics, as reported in the last column of Table 3 and in full in Appendix 2.

For round 1 and 2 income per capita and poverty, and annual income growth between the two rounds, Table VI reports, by marginalised group, actual and counterfactual figures, separately for upper-caste dominated villages and for own-group dominated villages. For the last-mentioned villages, counterfactual figures are based on what these variables would have been without the estimated enclave effect. For the first-mentioned villages, three sets of counterfactual figures are reported. First, income, growth and poverty are computed as if there is no general village regime effect (the coefficient on DUC); next as if there is no group specific oppression effect (e.g. the coefficient on SC x DUC); and finally as if there is neither effect. So, for

example, mean income per capita in round 1 for SCs living in UC-dominated villages is equal to 6,359 Rupees. Had they not benefited from the general village regime effect, it would have been 5,735 Rupees; had they not suffered from oppression, it would have been 6,941 Rupees; and if neither effect had been at work, it would have been 6,225 Rupees. The last figure is lower than their actual mean income, which shows that, in this case, the positive village regime effect is larger (in absolute terms) than the negative oppression effect.
The general village regime effect on income of marginalised groups living in UC-dominated villages is always about 10 percent, both in round 1 and in round 2: mean income would thus have been some 10 percent lower were it not for this effect. Since the effect on income is approximately the same size in both rounds, the effect on growth is negligible. The effect on the headcount percentage of poverty, on the other hand, depends on the group specific distribution of income in the vicinity of the poverty line. Muslims in round 1 benefited most and OBCs in round 2 least: poverty would have been 8.9 percentage points higher for the former and 4.7 percentage points higher for the latter, were it not for the general village regime effect.

The group specific oppression effect on income of living in UC-dominated villages, when statistically significant, tends to be larger than the general village regime effect, with one exception (SCs in round 1). Income in such villages would have been 14.4 percent higher for SCs in round 2, 12.3 percent higher for OBCs in round 2, and 15.8 percent higher for Muslims in round 1. The effect on growth is pronounced, too. SCs would have experienced 1.8 instead of 1.3 percent annual growth (22 percent over the entire period instead of 15 percent) and OBCs 2.0 instead of 0.9 percent (24 instead of 10 percent), were it not for oppression. Although the oppression effect dominates the general village regime effect for income, this is not always the case for poverty, which must be related to peculiarities of the PDF of income. It is worth noting, though, that poverty reduction would have been about 8 instead of 3 percentage points for OBCs, were it not for oppression – SCs would have experienced about the same amount of poverty reduction as they experienced actually, because the level effect in both rounds was of the same order of magnitude.

Enclave effects in the specification used are significant only for SCs and OBCs, in both rounds. For OBCs they are of the same order of magnitude (but positive) as the oppression effects remarked on above for this group. For SCs they are much larger. Income per capita would have been 13.1 percent lower in round 1, and 26.1 percent lower in round 2, annual growth 1.6 percentage points lower (20 percent less growth over the period), and poverty 7.6 and 18 percentage points lower in round 1 and round 2, were it not for the enclave effect. Poverty would have been far more persistent for SCs in own-dominated villages in the absence of this effect.

In summary, we find sizeable general village regime effects that benefit those residing in UC-dominated villages for income and poverty (but not for growth and

poverty reduction), and for SCs in both rounds, for OBCs in round 2 and for Muslims in round 1 an offsetting oppression effect of the same order of magnitude, although typically larger in absolute terms than the general village regime effect in the case of income and slightly smaller in the case of poverty. Growth for SCs and OBCs is substantially negatively affected by oppression. Enclave effects are large and positive for OBCs and especially SCs in terms of income and the absence of poverty, and for SCs in terms of growth, too.

V. Concluding remarks

Using a unique panel data set for rural India covering the years 1993/94 and 2004/05, we tested the hypotheses that Scheduled Castes, Scheduled Tribes, Muslims and OBCs fare worse in terms of income levels when residing in villages dominated by upper castes and whether the same groups fare better or worse in villages dominated by their own group. Our results provide strong support for the 'oppression' hypothesis and for the *positive* enclave hypothesis. In addition, and for all social groups, a considerable positive externality from residing in upper caste dominated villages was uncovered.

The quantitative effects on income levels, growth, poverty incidence and poverty persistence were discerned. The income levels of SCs living in upper caste dominated villages would have been 8.5 percent higher in round 1 and 14.4 percent higher in round 2 in the absence of oppression effects, while annual income growth would have been 0.5 percentage points higher, 1.8 instead of 1.3 percent. Further, the poverty incidence would have been more than 5 percentage points lower.

The negative 'enclave' hypothesis advances the view that the slow progress of marginalised communities may be driven by factors internal to the community itself. Consistent with Anderson's (2005) findings for Yadavs in Bihar and Uttar Pradesh, but in our case extending to marginalised groups below the pollution barrier, Scheduled Caste households in own dominated villages experienced far more rapid poverty reduction between the two rounds. In round 2, their income is 26.1 percent higher than it would have been without the enclave effect, and their incidence of poverty 18 percentage points lower, 29.7 instead of 47.7 percent.

While our enclave results, in particular for SCs in round 2, contrast with Munshi and Rosenzweig's (2006) findings from Dadar, Mumbai where dense labour market networks inhibit upwards mobility among lower caste young men, the magnitude of our raw social identity coefficients highlight the persistence of identity based disparities in rural India; whereas upper caste 'oppression' has contributed to prolong poverty and to low income among SC and OBC households there are, at the

same time, significant positive externalities associated with living in upper caste dominated villages.

We also shed new light on the pathways through which welfare disparities between different social groups within and outside villages dominated by upper castes may be closed. Educational attainment matters but mainly outside UC dominated villages. Overall, however, the old recipe of land redistribution holds the key to neutralising disparities attributable to upper caste dominance. This is in contrast to Dercon and Krishnan's (2007) findings based on the ICRISAT-panel which indicated that caste based disparities essentially have educational roots.

We also find that once all factor endowments are controlled for, the round 1 gap between SCs, STs and OBCs dramatically narrows. However, even after location, demography, village infrastructure and factor endowments are controlled for, the raw coefficients suggest that SC households with a similar resource base and attributes as others not only remained the worst off but fell further behind STs and OBCs in the post reform years. This is a timely empirical corrective to accounts suggesting sustained SC progress relative to other groups[41] and an important reminder to those who, inspired by India's 'silent revolution', place great hope in the transformative promise of the democratic process. The main exception is SCs residing in own enclaves; the SC enclave coefficient remains large and strongly significant after land holdings and all other controls are added.

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[41] Banerjee and Somanathan's (2007;308) findings on public good provision in 1991.

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Appendix I:
Construction of variables to capture upper caste dominance.

The village and household questionnaires contain data on three classifications of social groups, firstly and most disaggregated by *jati* [and name of tribe] (C1) (for Hindus, Muslims, Sikhs and STs), secondly by five broad categories (C2), namely Brahmin, OBC (Other backward classes), SC (Scheduled Caste), ST (Scheduled Tribe) and Other and finally by eight religious categories (C3), Hindu, Muslim, Christian, Sikh, Buddhist, Jain, Tribal and Other. The village questionnaire also contains information on the most (upto eight) numerous *jatis*, the percentage of the village population each of these *jatis* represent, and the percent of village land owned by each of these same *jatis*.

The oppression hypothesis is founded on the notion of (upper) caste dominance. If restricted to ritual rank, a simple and narrow definition would be to limit the upper caste label to *Brahmins*. Notions of upper caste advantage (and dominance) do, however, stretch beyond this top layer of the varna hierarchy.[42,43] A pragmatic alternative would be to add the "Other" category from the household questionnaire; the combination *Brahmin* (C2) plus "Other (C2)" and Hindu (C3) would then represent a broad definition of upper or forward caste *Hindus*.

There are, however, important problems associated with the latter option; Firstly, the exclusive focus on Hindus would miss out on social groups who may be in a position to wield considerable power and influence but who belong to a different faith. To illustrate, some of the numerically important *jatis* in our panel transcend religious boundaries; in Punjab there are significant numbers of Sikh and Hindu *Jat* households and Sikh and Hindu Dalit households with inter-caste violence involving *Jat* and Dalit Sikhs.[44] For Muslims and noted in footnote 23 in the main text, Fuller (1996) and others in the same volume contend that while caste-like arrangements are common, few within the Muslim community admit to their existence.[45] In spite of social ranks among Muslims, the less accurate reporting of the social groups that Muslim panel households belong to, left us with no other option but to define Muslim households by their religion alone. A similar strategy was adopted for Scheduled Tribes. Although the tribe a household belongs to is accurately reported,

[42] In addition, the prevalence of *Brahmin* households varies across regions.

[43] Even among *Brahmins* there are, of course, more fine-tuned internal rankings – *Gouda Saraswath* or *Konkani* Brahmins, who are fish eating residents of Karnataka's Coastal belt, have lower social status locally than the strictly vegetarian *Madhwa* or *Udupi Brahmins*.

[44] See http://hinduonnet.com/fline/fl2013/stories/20030704002703900.htm. Punjab is also the state with the highest percentage of Scheduled Castes in its population (28.9 % according to Census of India 2001). See Jodhka's (2004) discussion on Sikhism and caste.

[45] Jeffrey et al (2007: 43) note how 'during the pre-colonial era there were marked divisions between a very small, upper caste Muslim elite and other Muslims castes, such as weavers, carpenters and barbers'.

ethnographic evidence is not supportive of local hierarchies; STs thus features as a single social category in our analysis.

Secondly, the process of "de-Sanskritisation", whereby social groups lobby to downgrade their official status in order to avail of reservation benefits implies that the definitions of forward castes that anthropologists and sociologists, informed by careful field observations, subscribe to, are increasingly out of tune with official and survey data social group categories. The implementation of the Mandal Commission's (1978-80) recommendations added fresh impetus to reservations as political battleground and in the present political climate, it is not unusual to interpret the absence of 'backward' status as evidence of a social group's lack of political clout. Important groups that have acquired OBC status, include the 'clean-caste' *Vokkaligas*, the dominant peasant caste in Central and Southern Karnataka (e.g. Srinivas 1978; Epstein et al. 1998), the ritually superior *Lingayats* in the same state (Bayly 1999; 294) and more recently the *Jats* in Uttar Pradesh (e. g. Jeffrey 2001) and Rajasthan; official status is therefore, in key instances and increasingly, a reflection of political opportunism aimed at placating important vote banks with the unfortunate side effect of weakening the reliability of official status as indicator of ritual status.[46]

Other variations in caste status are found at the lower end: *Nuniyas* and *Dhanuks*, who are OBCs in Uttar Pradesh, have Scheduled Caste status in West-Bengal. *Dhobis* (washermen), have SC status in some states but not in others. For *jatis* traditionally concentrated in the most degrading occupations, like leatherworkers (e.g. *Chamars*) and sweepers (e.g. *Balmikis*), SC status is less variant to state boundaries.

Further, social groups that are not OBC, SC or ST should necessarily be treated as upper or forward castes for analytical purposes. There are intermediate social groups in many regions for whom a more fine tuned distinction is desirable. *Rods*, an important agricultural caste in Haryana, is classified as 'other' and thus forward officially as well as in the household questionnaire; this does not square with anthropological field observations (Prem Chowdhry, pers comm.). Further, and in tune with the Mandal commission's view and report, important agricultural castes such as the *Kurmis* of North and *Kunbis* of Central India do not enjoy the same local stature as *Jats* and *Marathas*, respectively (Singh 1992; 41 and Report of the Backward Class Commission, p.56 as cited in Jaffrelot 2003; 323). For the former two, the OBC classification is therefore appropriate.

In our interpretation of upper caste which is informed by anthropological observations, we adhere to ritual rank as far as the top and bottom layer is

[46] While de-Sanskritisation so far has tended to involve attempts to gain OBC-status, recent agitations by the *Gujjar*-community based on comparisons with the *Meena* community in Rajasthan aimed to downgrade their official status from OBC to ST. Similarly, in an article on UP politics, the Deccan Herald (4 March 2008), listed a number of groups whose official status were proposed 'downgraded' from OBC to SC.

concerned, but disconnect, whenever appropriate and for reasons mentioned above, from *official* categories for the more fluid middle layer. While this imposes an additional work burden, it is important to distinguish our small-scale endeavour from past efforts to develop comprehensive caste rankings for rural India. British colonial administrators have subsequently been caricatured for believing in the possibility of such a task which at the time paved the way for an obsession with caste and jati among late Victorian data collectors (Bayly 1999, chapter 3). For North-India, our classification of the most important and by far the most numerous groups (and households in our panel) is consistent with the Mandal Commission's views and according to which the following broad groups should be treated as forward or upper castes; *Brahmins* (including Bhumihars) *Rajputs*, *Kayasthas*, *Jats*, *Marathas*, *Vaishyas*/*Banias* (Jaffrelot 2003; 323).

An informed reader will notice the inclusion of cultivating castes like North-Indian *Jats* along with the conspicuous absence of similar castes in the South on the Mandal commission's list. There is also a distinction between the caste 'taxonomy' in Jaffrelot's (2003) classifications of Indian politicians and the Mandal commission list with the former denoting the top layer among cultivating castes as 'intermediate'. Jaffrelot's 'intermediate group' includes among others the aforementioned *Jats*, plus *Reddy* and *Kamma* in Andhra Pradesh and *Vokkaligas* and *Lingayats* in Karnataka. Apart from our preferring 'upper' or 'forward' to 'intermediate' our classification is also for the main and most numerous groups (e.g *Khandayats* in Orissa, *Patidars* in Gujarat) consistent with Jaffrelot (2003).[47]

[47] The state-wise official lists of STs, SCs and OBCs provide a rich source of information and were extensively consulted to cross check the SC and ST classifications in the raw data.

	Upper castes
ALL INDIA	Brahmin, Bhumihar, Rajput (general, Thakur), Kayastha, Kshatriya, Khatri, Maratha, Jat (Sikh and Hindu), Marwari, Bania (e.g. Agarwal, Gupta) (plus equivalents in the South: *Vysya* in Andhra Pradesh, *Chettiar* in Tamil Nadu)
ADDITIONAL BY STATE	
Himachal Pradesh	Rajput (Suniar), Choudhary
Punjab	Rajput (Suniar), Kamboj (Sikh), Choudhary, Mahant (Sikh), Arora, Ahluwalia, Mahajan, Sood, Visnoi
Uttaranchal	Rana
Haryana	Rajput (Chauhan, Bishnoi), Jat (Jhangi), Kamboj (Sikh)
Rajasthan	Choudhary, Mahajan
Gujarat	Patel (general, Patidar, Leva, Kadava), Rajput (Jadeja [Chandravanshi], Parmar, Solanki), Darbar
Uttar Pradesh	Rajput (Chauhan, Negi [Gharwali]), Srivastava, Choudhary
West Bengal	Pokhrel, Dahal, Chettri, Mahishya, Sadgop, Roy
Orissa	Patnaik (general, Karan), Pradhan, Khandayat, Odia, Kalandi
Madhya Pradesh	Jat (Tomar), Choudhary, Maharaj
Andhra Pradesh	Reddy, Kapu [Balija, Telaga], Kamma [Naidu], Velama, Chowdary, Rajulu
Karnataka	Lingayat, Vokkaliga
Tamil Nadu	Mudaliar, Vellalar, Nayar, Reddy, Naidu, Kamma Naidu
Kerala	Nayar (Nair)

Table A1 provides a listing of upper castes based on our definition and begins with all India upper caste *jatis*; these are classified as upper castes in all states. The state listing provides additional upper caste *jatis*, which are either sub-groups of the main jatis (*Jats* or *Rajputs*, say) or belong to a different upper caste social group (e.g *Mahajan*; *Leva Patel*). Note that the following list is based exclusively on *jatis* that feature in the panel data set/village level social composition data. If a state is not specifically listed (e.g. Maharashtra), all upper caste groups in that state are included in the ALL INDIA row. Notice also that the *jatis* in the ALL India row are by far the most numerous in the North. A careful reader may also notice that while Andhra castes and Kerala *Nayars* are included in Tamil Nadu, this is not the case the other way around. This is by co-incidence – there are no upper caste households from Tamil Nadu amongst our Andhra Pradesh panel households.

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Appendix 2

Table A2.1 Estimation results of the effects on income of social identity, village regime and demographic and locational controls

Model:	Social identity terms				Plus village regime				Plus agro-ecological zones				Plus state dummies				Plus demographic controls			
	Round 1		Round 2		Round 1		Round 2		Round 1		Round 2		Round 1		Round 2		Round 1		Round 2	
	b	t	b	t	B	t	b	t	b	t	b	t	b	t	b	t	b	t	b	t
Social identity:																				
SC	-0.463	-20.29	-0.607	-24.75	-0.374	-9.4	-0.51	-11.91	-0.381	-9.55	-0.517	-12.13	-0.384	-9.61	-0.519	-12.21	-0.37	-9.55	-0.455	-11.18
ST	-0.458	-12.8	-0.601	-16.3	-0.31	-4.57	-0.462	-6.95	-0.296	-4.44	-0.423	-6.41	-0.295	-4.42	-0.442	-6.77	-0.309	-4.92	-0.374	-6.23
OBC	-0.267	-11.4	-0.371	-14.92	-0.291	-5.87	-0.338	-6.09	-0.263	-5.38	-0.319	-5.81	-0.256	-5.23	-0.312	-5.79	-0.216	-4.59	-0.264	-5.16
MUS	-0.406	-10.81	-0.53	-12.73	-0.289	-4.76	-0.446	-6.68	-0.269	-4.4	-0.439	-6.58	-0.276	-4.49	-0.466	-7.12	-0.201	-3.35	-0.324	-5.14
Village regime:																				
SC X DSC					0.032	0.48	0.268	3.55	0.099	1.46	0.259	3.46	0.111	1.66	0.282	3.83	0.14	2.18	0.302	4.25
SC X PSC					-0.031	-0.59	0.062	1.08	-0.032	-0.6	0.059	1.06	-0.052	-0.99	0.048	0.87	-0.048	-0.97	0.074	1.43
ST X DST					-0.088	-1.22	-0.056	-0.78	-0.055	-0.79	-0.023	-0.33	-0.049	-0.69	-0.002	-0.04	-0.017	-0.26	-0.001	-0.01
OBC X DOBC					0.17	3.58	0.142	2.73	0.133	2.87	0.124	2.46	0.122	2.65	0.121	2.45	0.098	2.21	0.118	2.56
OBC X POBC					0	0.01	0.156	2.3	-0.042	-0.68	0.123	1.84	-0.058	-0.94	0.128	1.98	-0.053	-0.91	0.129	2.13
MUS X DMUS					-0.023	-0.28	0.16	1.85	-0.063	-0.79	0.084	0.98	-0.052	-0.65	0.101	1.23	-0.015	-0.2	0.122	1.58
DUC					0.202	4.2	0.285	5.67	0.128	2.63	0.176	3.47	0.116	2.39	0.112	2.3	0.109	2.32	0.107	2.32
SC X DUC					-0.113	-2.3	-0.149	-2.83	-0.108	-2.21	-0.137	-2.62	-0.103	-2.09	-0.135	-2.59	-0.082	-1.75	-0.135	-2.72
ST X DUC					-0.222	-2.02	-0.03	-0.27	-0.234	-2.2	-0.047	-0.43	-0.211	-1.97	-0.014	-0.13	-0.132	-1.27	-0.007	-0.07
MUS X DUC					-0.187	-2.11	-0.142	-1.41	-0.214	-2.43	-0.145	-1.44	-0.184	-2.08	-0.071	-0.71	-0.147	-1.75	-0.079	-0.84
OBC X DUC					-0.024	-0.41	-0.127	-1.99	-0.045	-0.78	-0.125	-1.96	-0.048	-0.84	-0.124	-1.98	-0.078	-1.41	-0.116	-1.95
Agro-ecological zones:																				
aez2									0.273	2.96	0.271	2.91	0.637	1.46	0.458	1.16	0.452	1.09	0.52	1.45
aez3									0.601	3.83	-0.217	-1.29	0.602	1.45	-0.127	-0.35	0.441	1.12	-0.173	-0.52
aez4									0.114	1.71	0.114	1.58	0.383	0.89	0.322	0.82	0.173	0.42	0.372	1.05
aez5									0.077	0.93	-0.204	-2.35	0.388	0.91	0.156	0.4	0.165	0.41	0.16	0.45
aez6									0.316	4.15	-0.05	-0.64	0.601	1.47	0.275	0.77	0.462	1.2	0.233	0.72
aez7									0.49	3.5	-0.024	-0.19	0.319	0.73	-0.208	-0.56	0.202	0.49	-0.188	-0.55
aez8									0.21	2.17	0.046	0.48	0.114	0.28	0.284	0.8	-0.071	-0.18	0.187	0.57
aez9									0.281	3.43	0.125	1.45	0.506	1.15	0.4	1	0.273	0.66	0.389	1.07

Model:	Social identity terms				Plus village regime				Plus agro-ecological zones				Plus state dummies				Plus demographic controls			
	Round 1		Round 2		Round 1		Round 2		Round 1		Round 2		Round 1		Round 2		Round 1		Round 2	
	b	t	b	t	B	t	b	t	b	t	b	t	b	t	b	t	b	t	b	t
aez10									-0.02	-0.26	-0.296	-3.67	0.21	0.5	0.291	0.77	0.017	0.04	0.278	0.81
aez11									0.034	0.43	-0.116	-1.37	0.261	0.69	0.546	1.62	0.139	0.39	0.524	1.73
aez12									-0.288	-3.68	-0.379	-4.62	-0.046	-0.13	0.193	0.64	-0.169	-0.51	0.151	0.55
aez13									-0.115	-1.21	-0.275	-2.65	0.049	0.1	0.259	0.61	-0.114	-0.26	0.272	0.71
aez14									-0.082	-1.04	0.23	2.82	0.34	0.75	0.274	0.66	0.068	0.16	0.255	0.68
aez16									-0.63	-3.37	-0.266	-1.18	-0.611	-3.35	-0.212	-1.01	-0.683	-3.76	-0.175	-0.94
aez17									-0.195	-1.31	0.365	1.94	-0.224	-0.54	0.429	1.15				
aez18									-0.247	-1.47	-0.61	-4.03	0.041	0.1	0.115	0.34	-0.015	-0.04	0.054	0.17
aez19									0.251	1.99	0.178	1.25	0.222	0.52	0.167	0.45	0.011	0.03	0.085	0.25
State dummy variables:																				
Bihar													-0.188	-0.68	-0.467	-1.79	-0.035	-0.13	-0.318	-1.29
Gujarat													-0.344	-1.55	-0.122	-0.55	-0.248	-1.2	-0.114	-0.56
Haryana													-0.088	-0.39	0.058	0.26	0.103	0.49	0.101	0.48
Himachal Pradesh													-0.494	-1.84	0.043	0.16	-0.285	-1.13	0.077	0.31
Karnataka													-0.546	-1.84	-0.27	-1.32	-0.409	-1.35	-0.111	-0.55
Kerala													0.144	0.55	0.595	2.17	0.228	0.92	0.559	2.13
Madhya Pradesh													-0.253	-1.27	-0.528	-2.66	-0.1	-0.55	-0.457	-2.49
Maharashtra													-0.321	-2.21	-0.262	-1.81	-0.26	-1.96	-0.205	-1.5
Orissa													-0.366	-2.03	-0.67	-4.49	-0.352	-2.09	-0.584	-4.2
Punjab													-0.258	-1.09	0.153	0.66	-0.102	-0.46	0.181	0.84
Rajasthan													-0.513	-2.3	-0.225	-1.02	-0.328	-1.58	-0.143	-0.7
Tamil Nadu													0.067	0.47	-0.223	-1.65	0.099	0.73	-0.16	-1.22
Uttar Pradesh													-0.39	-1.67	-0.426	-1.87	-0.206	-0.95	-0.312	-1.48
West Bengal													-0.046	-0.13	0.025	0.08	-0.122	-0.35	0.029	0.1
Uttaranchal													-0.448	-1.68	-0.214	-0.78	-0.235	-0.94	-0.114	-0.45
Chattisgarh													-0.27	-1.33	-0.627	-3.28	-0.23	-1.22	-0.564	-3.28
Jharkhand													-0.033	-0.17	-0.146	-0.84	0.042	0.22	-0.128	-0.8
Tripura																	-0.352	-0.9	0.403	1.19

Model:	Social identity terms				Plus village regime				Plus agro-ecological zones				Plus state dummies				Plus demographic controls			
	Round 1		Round 2		Round 1		Round 2		Round 1		Round 2		Round 1		Round 2		Round 1		Round 2	
	b	t	b	t	B	t	b	t	b	t	b	t	b	t	b	t	b	t	b	t
Demographic controls																				
Sex of hh head (male = 1)																	0.031	1.51	-0.012	-0.51
# males aged 0-5																	-0.146	-13.58	-0.179	-14.14
# males aged 6-14																	-0.112	-12.92	-0.142	-15.32
# males aged 15-19																	-0.005	-0.41	-0.036	-2.74
# males, aged 20-24																	0.072	4.79	0.059	3.78
# males, aged 25-49																	0.104	5.74	0.108	7.04
# males, aged 50-59																	0.178	8.03	0.135	5.92
# males, aged 60 +																	0.075	3.57	0.055	2.7
# females, aged 0-5																	-0.131	-13.21	-0.154	-11.97
# females, aged 6-14																	-0.117	-13.76	-0.134	-15.08
# females, aged 15-19																	-0.066	-4.46	-0.089	-6.89
# females, aged 20-24																	-0.016	-0.79	-0.016	-0.88
# females, aged 25-49																	0.07	3.34	0.09	4.62
# females, aged 50-59																	0	0	0.098	3.81
# females, aged 60 +																	0.014	0.59	-0.031	-1.36
# of couples in household																	-0.021	-1.24	0.05	2.92
Constant	8.958	389.79	9.192	385.09	8.83	234.67	9.008	224.26	8.787	139.06	9.092	127.22	8.82	22.53	9.043	26.69	8.946	24.04	8.944	28.69
R squared	0.061		0.095		0.066		0.107		0.115		0.161		0.137		0.200		0.213		0.284	
N	9111		9111		9111		9111		9111		9111		9111		9111		9111		9111	

Source: HDPI-I ("round 1") and II ("round 2") surveys, panel households only; authors' calculations.
Notes: Dependent variable is the natural logarithm of annual per capita household income in constant 1993/94 prices, with round 2 figures converted using NSSO state-specific rural CPIs. Random effects, with standard errors that are robust to heteroskedasticity and clustering within villages; robust t-statistics are reported.

Table A2.2 Estimation results of the effects on income of social identity, village regime and additional controls: village infrastructure, household education and land

Controls added:	Village infrastructure				Plus education				Plus land			
	Round 1		Round 2		Round 1		Round 2		Round 1		Round 2	
	b	t	B	t	b	t	b	t	b	t	b	t
Social identity:												
SC	-0.369	-9.56	-0.452	-11.07	-0.245	-6.58	-0.321	-8.23	-0.154	-4.49	-0.252	-6.81
ST	-0.311	-4.95	-0.374	-6.17	-0.172	-2.81	-0.234	-4.09	-0.152	-2.72	-0.203	-3.64
OBC	-0.21	-4.45	-0.259	-5.05	-0.141	-3.08	-0.181	-3.7	-0.129	-3.12	-0.148	-3.25
MUS	-0.208	-3.48	-0.324	-5.12	-0.113	-1.98	-0.217	-3.59	-0.065	-1.23	-0.14	-2.38
Village regime:												
SC X DSC	0.131	2.05	0.289	4.03	0.123	2.01	0.253	3.64	0.06	1.05	0.205	3.16
SC X PSC	-0.035	-0.72	0.076	1.44	-0.053	-1.08	0.07	1.39	-0.062	-1.34	0.059	1.23
ST X DST	0.008	0.12	0.019	0.31	-0.006	-0.1	0.005	0.08	0.012	0.22	-0.012	-0.22
OBC X DOBC	0.095	2.15	0.115	2.49	0.094	2.16	0.097	2.19	0.067	1.73	0.05	1.21
OBC X POBC	-0.059	-1.0	0.134	2.2	-0.044	-0.77	0.118	1.98	-0.012	-0.23	0.106	1.98
MUS X DMUS	0.003	0.04	0.147	1.88	0.006	0.08	0.15	2.01	-0.048	-0.73	0.087	1.21
DUC	0.116	2.48	0.107	2.3	0.124	2.76	0.105	2.36	0.035	0.89	0.024	0.57
SC X DUC	-0.09	-1.92	-0.14	-2.81	-0.107	-2.39	-0.15	-3.17	0.01	0.24	-0.045	-1.01
ST X DUC	-0.14	-1.35	-0.01	-0.1	-0.129	-1.27	0.017	0.18	-0.032	-0.36	0.112	1.26
MUS X DUC	-0.15	-1.79	-0.094	-0.99	-0.129	-1.58	-0.054	-0.58	0.026	0.34	0.003	0.03
OBC X DUC	-0.091	-1.64	-0.123	-2.07	-0.085	-1.59	-0.113	-1.99	0.076	1.59	0.001	0.01
Agro-ecological zones:												
aez2	0.175	0.42	0.341	0.88	0.18	0.44	0.296	0.81	-0.026	-0.07	0.223	0.64
aez3	0.42	1.06	-0.316	-0.86	0.358	0.93	-0.33	-0.95	0.133	0.38	-0.348	-1.05
aez4	-0.096	-0.23	0.173	0.45	-0.137	-0.34	0.092	0.25	-0.195	-0.52	0.125	0.37
aez5	-0.07	-0.17	-0.009	-0.02	-0.056	-0.14	-0.066	-0.18	-0.177	-0.48	-0.058	-0.17
aez6	0.324	0.84	0.111	0.31	0.348	0.91	0.079	0.24	0.233	0.67	0.042	0.13
aez7	0.149	0.36	-0.342	-0.92	0.22	0.54	-0.294	-0.83	0.028	0.08	-0.319	-0.95
aez8	-0.046	-0.12	0.07	0.19	0.006	0.02	0.093	0.27	-0.141	-0.4	0.087	0.27
aez9	0.038	0.09	0.191	0.49	0.001	0	0.072	0.2	-0.043	-0.11	0.139	0.4

Controls added:	Village infrastructure				Plus education				Plus land			
	Round 1		Round 2		Round 1		Round 2		Round 1		Round 2	
	b	t	B	t	b	t	b	t	b	t	b	t
aez10	-0.15	-0.38	0.118	0.32	-0.211	-0.54	-0.006	-0.02	-0.265	-0.73	0.02	0.06
aez11	0.046	0.13	0.283	0.85	0.029	0.08	0.244	0.79	-0.12	-0.36	0.194	0.65
aez12	-0.125	-0.38	0	0	-0.078	-0.24	0.039	0.14	-0.184	-0.61	0.006	0.02
aez13	-0.374	-0.84	0.074	0.18	-0.303	-0.69	-0.036	-0.09	-0.159	-0.41	0.087	0.24
aez14	-0.132	-0.3	0.064	0.16	-0.287	-0.67	-0.114	-0.3	-0.178	-0.46	0.028	0.08
aez16	-0.547	-3.11	-0.129	-0.68	-0.516	-3.06	-0.146	-0.82	-0.413	-2.48	-0.102	-0.59
aez17	-0.305	-0.78	0.223	0.6	-0.268	-0.69	0.231	0.66	-0.318	-0.89	0.171	0.52
aez18	-0.016	-0.04	-0.074	-0.22	0.037	0.1	-0.031	-0.1	-0.068	-0.2	-0.005	-0.02
aez19	-0.03	-0.07	-0.049	-0.13	-0.081	-0.2	-0.116	-0.33	-0.093	-0.25	-0.049	-0.15
State dummy variables:												
Bihar	0.166	0.63	-0.253	-1.01	0.159	0.6	-0.15	-0.62	-0.15	-0.69	-0.244	-1.09
Gujarat	-0.051	-0.24	-0.068	-0.33	0.016	0.08	0.031	0.16	0.002	0.01	-0.051	-0.28
Haryana	0.307	1.41	0.136	0.64	0.395	1.81	0.234	1.14	0.224	1.15	0.184	0.98
Himachal Pradesh	-0.042	-0.17	0.136	0.55	0.116	0.46	0.259	1.08	0.011	0.05	0.225	1.01
Karnataka	-0.344	-1.15	-0.102	-0.5	-0.286	-0.93	-0.086	-0.44	-0.344	-1.28	-0.101	-0.55
Kerala	0.241	0.97	0.491	1.83	0.251	1.05	0.427	1.63	0.255	1.15	0.433	1.71
Madhya Pradesh	0.179	0.92	-0.398	-2.12	0.288	1.48	-0.255	-1.41	0.097	0.55	-0.353	-2.11
Maharashtra	-0.17	-1.23	-0.213	-1.53	-0.145	-1.05	-0.21	-1.6	-0.184	-1.49	-0.221	-1.83
Orissa	-0.302	-1.77	-0.581	-4.07	-0.275	-1.64	-0.576	-4.19	-0.271	-1.81	-0.536	-4.15
Punjab	0.076	0.34	0.222	1.02	0.174	0.78	0.312	1.48	-0.065	-0.33	0.233	1.21
Rajasthan	-0.095	-0.44	-0.08	-0.38	0.014	0.07	0.038	0.19	-0.099	-0.51	-0.041	-0.22
Tamil Nadu	0.043	0.32	-0.183	-1.35	0.014	0.1	-0.222	-1.63	0.037	0.3	-0.228	-1.78
Uttar Pradesh	0.017	0.08	-0.256	-1.18	0.115	0.51	-0.152	-0.73	-0.02	-0.1	-0.215	-1.11
West Bengal	-0.15	-0.43	-0.117	-0.37	-0.09	-0.26	-0.071	-0.24	-0.209	-0.67	-0.063	-0.22
Uttaranchal	0.012	0.05	-0.049	-0.19	0.183	0.73	0.131	0.52	-0.038	-0.17	0.018	0.08
Chattisgarh	-0.115	-0.6	-0.453	-2.5	-0.037	-0.2	-0.387	-2.25	-0.013	-0.07	-0.369	-2.29
Jharkhand	0.04	0.22	-0.079	-0.48	0.054	0.3	-0.082	-0.52	0.077	0.46	-0.002	-0.01
Tripura												

Controls added:	Village infrastructure				Plus education				Plus land			
	Round 1		Round 2		Round 1		Round 2		Round 1		Round 2	
	b	t	B	t	b	t	b	t	b	t	b	t
Demographic controls:												
Sex of hh head (male = 1)	0.031	1.51	-0.013	-0.55	0.039	1.93	-0.015	-0.66	0.039	2.16	-0.02	-0.92
# males aged 0-5	-0.146	-13.51	-0.178	-14.03	-0.139	-13.27	-0.16	-13.14	-0.149	-16.14	-0.149	-12.72
# males aged 6-14	-0.112	-12.88	-0.141	-15.2	-0.102	-12.22	-0.114	-12.73	-0.125	-16.59	-0.125	-14.64
# males aged 15-19	-0.006	-0.44	-0.035	-2.72	-0.046	-3.62	-0.073	-5.47	-0.077	-6.86	-0.094	-7.63
# males, aged 20-24	0.072	4.75	0.06	3.81	0.011	0.73	-0.015	-0.93	-0.011	-0.82	-0.032	-2.18
# males, aged 25-49	0.103	5.72	0.108	7.01	0.041	2.38	0.01	0.66	0.013	0.84	-0.01	-0.72
# males, aged 50-59	0.179	8.1	0.134	5.9	0.116	5.47	0.065	2.93	0.058	3.1	0.031	1.49
# males, aged 60 +	0.075	3.6	0.055	2.7	0.028	1.4	0.002	0.12	-0.03	-1.73	-0.038	-2.06
# females, aged 0-5	-0.131	-13.24	-0.153	-11.9	-0.124	-12.84	-0.135	-11.02	-0.132	-15.45	-0.138	-11.85
# females, aged 6-14	-0.117	-13.72	-0.135	-15.14	-0.112	-13.6	-0.117	-13.68	-0.129	-17.12	-0.131	-16.25
# females, aged 15-19	-0.067	-4.52	-0.09	-6.89	-0.131	-8.34	-0.136	-9.74	-0.135	-9.73	-0.145	-10.88
# females, aged 20-24	-0.017	-0.86	-0.018	-0.97	-0.092	-4.43	-0.103	-5.48	-0.102	-5.38	-0.112	-6.41
# females, aged 25-49	0.068	3.24	0.088	4.51	-0.005	-0.23	-0.007	-0.36	-0.036	-1.88	-0.045	-2.38
# females, aged 50-59	-0.002	-0.11	0.096	3.74	-0.055	-2.48	0.006	0.26	-0.075	-3.8	-0.021	-0.91
# females, aged 60 +	0.011	0.47	-0.034	-1.47	-0.043	-1.84	-0.104	-4.66	-0.077	-3.69	-0.131	-6.31
# of couples in household	-0.019	-1.12	0.052	3.01	0.026	1.62	0.106	6.29	0.007	0.49	0.067	4.25
Village infrastructure:												
Ln(village population)	0.017	0.88	-0.006	-0.38	0.006	0.33	-0.011	-0.78	0.011	0.64	-0.009	-0.61
School access:												
Primary	0.006	0.06	0.365	1.89	-0.017	-0.18	0.276	1.51	-0.012	-0.14	0.306	1.79
Middle	-0.194	-3.21	-0.128	-1.89	-0.184	-3.13	-0.051	-0.77	-0.126	-2.47	-0.066	-1.05
Lower secondary	0.044	0.65	-0.096	-1.57	0.058	0.86	-0.034	-0.57	0.062	1.04	-0.078	-1.41
Higher secondary	-0.012	-0.28	-0.075	-1.34	-0.006	-0.13	-0.044	-0.81	-0.023	-0.61	-0.058	-1.12
Graduate	-0.018	-0.44	-0.068	-1.27	-0.021	-0.51	-0.036	-0.69	-0.021	-0.57	-0.048	-0.97
Vocational	-0.016	-0.34	-0.028	-0.41	-0.043	-0.91	-0.013	-0.2	-0.003	-0.07	-0.019	-0.31
Medical access:												
Doctor	0	-0.2	-0.003	-1.85	0	-0.02	-0.002	-1.55	-0.001	-0.76	-0.002	-1.65

Controls added:	Village infrastructure				Plus education				Plus land			
	Round 1		Round 2		Round 1		Round 2		Round 1		Round 2	
	b	t	B	t	b	t	b	t	b	t	b	t
Clinic	-0.017	-0.49	-0.033	-1.08	-0.036	-1.09	-0.035	-1.18	-0.027	-0.91	-0.016	-0.56
Road access:												
Feeder	0.069	1.31	-0.012	-0.21	0.064	1.23	-0.018	-0.33	0.039	0.83	-0.017	-0.34
Tarmac	0.115	2.0	0.008	0.13	0.099	1.76	-0.004	-0.08	0.078	1.54	-0.008	-0.16
Bus stop	0.016	0.42	0.004	0.14	0.015	0.4	0.011	0.38	0.01	0.32	0.014	0.51
Railway station	0.1	1.96	0.105	2.09	0.063	1.29	0.068	1.43	0.068	1.54	0.057	1.28
Post office	0.11	3.04	0.029	0.95	0.106	2.99	0.015	0.52	0.109	3.4	0.017	0.63
Bank/credit market	-0.048	-1.3	-0.013	-0.39	-0.055	-1.51	-0.048	-1.52	-0.028	-0.87	-0.023	-0.75
Market/mandi	-0.066	-1.81	0.001	0.05	-0.074	-2.09	0.004	0.15	-0.062	-1.94	0.013	0.48
Max. educational achievement in the household (of those 15+):												
Up to primary					0.082	4.36	0.034	1.51	0.067	4.06	0.041	1.94
Middle					0.177	7.94	0.128	5.98	0.143	7.31	0.129	6.38
Matriculation					0.273	10.01	0.308	10.64	0.208	8.55	0.285	10.45
Higher secondary					0.342	10.07	0.363	11.71	0.28	9.05	0.31	10.54
Graduate and above					0.584	15.23	0.606	16.5	0.457	12.75	0.512	14.33
Up to primary					0.083	4.05	0.087	4.01	0.061	3.4	0.071	3.51
Middle					0.19	6.64	0.116	5.2	0.138	5.46	0.088	4.2
Matriculation					0.247	6.96	0.149	4.6	0.163	5.13	0.14	4.54
Higher secondary					0.193	3.15	0.33	8.34	0.214	3.66	0.263	7.02
Graduate and above					0.263	2.98	0.336	6.25	0.288	3.63	0.287	5.57
Household land:												
Land owned in acres									0.022	5.56	0.029	7.48
Land gross irrigated in acres									0.047	12.5	0.036	4.99
Constant	8.747	21.21	9.207	23.96	8.659	21.33	9.076	25.09	8.822	23.79	9.157	26.48
R squared	0.225		0.288		0.270		0.341		0.426		0.418	
N	9111		9111		9111		9111		9111		9111	

Source and Notes: as for Table A2.1