6-1-2021

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Journal of Comparative Economics 49 (2021) 442–466

Contents lists available at ScienceDirect

Journal of Comparative Economics

journal homepage: www.elsevier.com/locate/jce

Touch thee not: Group conflict, caste power and untouchability in rural India

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ARTICLE INFO

JEL classification:
D72
D74
J71
J78
Z13

Keywords:
Caste conflict
Social norm
Discrimination
Untouchability
India

ABSTRACT

We investigate the impact of community power on the practice of untouchability - the avoidance of physical contact – by upper and backward caste Hindus vis-à-vis 'scheduled' castes (SCs) in rural India. We hypothesize that an upper or Other Backward caste (OBC) household's propensity to practise untouchability is determined not solely by its own characteristics but, crucially, also by the inter-group distribution of resources across both caste and religious divides, via political contestation over behavioural norms. Our model predicts that greater collective resource endowment (power) of SCs, or that of Muslims and Christians, will reduce the likelihood of an upper caste or OBC household practising untouchability. A marginal redistribution of power from OBCs to upper castes may reduce it as well. Greater power of the combined upper caste and OBC bloc will increase it. Identifying a community's power with its population weighted land share, we find associations consistent with these predictions in data from the India Human Development Survey 2011–12.

1. Introduction

An extensive literature, stemming from the seminal work of Becker (1957), has sought to address the twin questions of how (a) individual cost-benefit calculus may sustain or undercut economic and social discrimination, and (b) how such discrimination may in turn affect the wellbeing of individuals. In reality, the cost-benefit structure, within whose parameters individuals take decentralized decisions about whether to indulge their 'taste' for discrimination, is itself often determined by a prior process of conscious collective political action undertaken by antagonistic groups. Competing political mobilizations and contestations around the US Civil Rights movement, which critically influenced both the content and enforcement of anti-discrimination legislation, constitute one example. Yet, economic analyses of discrimination usually abstract from these prior political processes of collective action and group conflict. This paper seeks to address this lacuna in the literature by foregrounding such processes as critical determinants of decentralized individual decision-making, within the context of a particularly extreme form of socio-economic discrimination. Specifically, we examine the role played by village-level community power in influencing the practice of untouchability amongst upper and backward caste Hindus in rural India. We theoretically model the idea that a Hindu upper or backward caste household's propensity to practise untouchability vis-à-vis Hindu 'scheduled' castes is determined not solely by its own characteristics but, crucially, also by the

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https://doi.org/10.1016/j.jce.2020.12.003
Received 28 November 2019; Received in revised form 14 December 2020; Accepted 16 December 2020
Available online 29 December 2020

inter-group distribution of resources across both caste and religious divides. We rationalize this as the consequence of village-level conflicts over collective assertions of both caste and religious identities. Our empirical analysis draws attention to the community power of 'third parties' such as Muslims and Christians, as well as social cleavages between upper and backward caste Hindus, as possible explanations for much of the incidence of untouchability.

India's caste system, a defining feature of Hinduism, is perhaps the world's longest surviving social hierarchy. Traditionally, Hindu society has been segmented into a complex ranking of various castes, based on notions of ritual purity. Brahmins were placed at the apex, followed by other 'Forward' castes and the so-called 'Other Backward' castes (OBCs), while the so-called 'Scheduled' castes (SCs) constituted the bottom of the hierarchy. Occupational specialization and endogamy have been the key characteristics of the system, with Brahmins constituting the traditional intelligentsia, Forward castes (FCs) largely engaged in administration, law enforcement and trade, OBCs constituting the primary component of the peasantry, and SCs confined to menial and low-end artisanal occupations. Norms of ritual purity and pollution, which underlie the system, include the idea that individuals belonging to other castes would be 'polluted' by coming into physical contact with those born into the SC category. This leads to the practice of 'untouchability': the avoidance of physical contact by the former with the latter. Historically, this entailed residential segregation, stringent restrictions on social interaction between SCs and other castes including a complete taboo on inter-marriage, avoidance by other castes of food handled by SCs, non-access of SCs to public spaces and communal facilities such as roads, village wells, schools, temples, and entry barriers against SCs in most professions.[1]

Discrimination against SCs in general and the practice of untouchability in particular were made illegal by the Indian Constitution immediately after Independence, and affirmative action programs were instituted for their benefit.[2] However, despite legal prohibition, the practice continues to limit access of SCs to public spaces and facilities, as well as informal social and professional networks, especially in less developed rural areas. This restricts the accumulation of social capital on their part and puts up significant structural barriers to their entry into historically upper caste occupations.[3] An understanding of the factors that determine the prevalence of untouchability thus remains of critical importance in reducing caste-based rigidities and entry barriers in India's labour market.

Extensive, and often violent, conflicts between SCs and upper castes or OBCs, as well as between Hindus and Muslims, continue to constitute arguably the most salient features of the political landscape in India.[4] Such group conflicts provide the motivating backdrop for our analysis. Our entry-point is the idea that the legitimacy of caste-exclusionary Hindu behavioural norms is *contested* at the village level. It is determined as the outcome of a prior process of group conflict and negotiation between upper castes and OBCs on the one hand, and SCs on the other. The outcomes of such caste contests are however affected by a simultaneous process of religious conflict between Hindus and Muslims (or Christians). Hence, the incidence of untouchability is impacted by village-level differences in the distribution of resources (and therefore political power) across caste and religious communities. An upper caste or OBC Hindu household's decision to practise untouchability is determined not solely by its own inherent characteristics (as in Thorat and Joshi, 2020), but, crucially, also by the inter-group distribution of collective resources, via the mediation of a process of political contestation. As such, to the best of our knowledge, ours is the first paper to examine how collective caste power may determine the decentralized and individual incidence of the practice of untouchability by upper caste and OBC Hindus, and we do so both theoretically and empirically.

We develop a model of tripartite group contestation over social norms, wherein the combined upper caste and OBC Hindu bloc engages in a contest with the SC community over the extent to which behavioural norms within the village should legitimise the

[1] 'Scheduled Caste' is the term used for these communities in the Constitution of India. The Constitution (Scheduled Castes) Order, 1950 lists 1,108 castes in its First Schedule. The scope and stringency of the restrictions faced by SCs varied across time and space, as well as according to caste divisions among the SCs themselves. The system has been studied extensively by sociologists and historians (e.g., Ambedkar, 1946; Srinivas, 1952; Dumont, 1970; Béteille, 1971; Gandhi, 1982 and Sharma, 1990). Economists' attempts to theorize the presence and persistence of caste differentiation include Akerlof (1976), Scoville (1996), Bidner and Eswaran (2015) and Munshi (2019). These contributions however focus on the much broader issue of identifying the economic functions that might rationalize the caste system. Our interest, instead, lies in the question of how economic fundamentals might affect the degree to which one specific behavioural manifestation of that system, viz., the practice of untouchability, is observed in contemporary India. Iyer (2018) provides an extensive recent overview and analysis of the literature on the economics of religion in India, with particular reference to Hinduism.

[2] Such affirmative action programs also cover the so-called Scheduled Tribes (STs). The social location of STs in relation to the traditional Hindu caste hierarchy is however somewhat different from that of SCs – STs are located largely outside that hierarchy, while SCs are located at its bottom. We leave STs out of the formal analysis in this paper partly for simplicity, partly due to their small numbers, and partly to highlight the difference in their social location (and consequent communal self-identification) vis-à-vis SCs.

[3] See Deshpande (2011), Mosse (2018) and Munshi (2019) for extended discussions and references to the literature. Shah et al. (2006), in their study of untouchability covering 550 villages in 11 main states, found that SCs were prevented from full participation in local markets and often from entering village shops in 30%–40% of the villages surveyed. In 45%–50% of these villages, SCs were prevented from selling milk to village dairy cooperatives. Girard (2018) studies the exclusion of SCs from the use of public roads in rural India, in the policy context of electoral reservations for them.

[4] For caste conflicts between SCs and upper castes or OBCs in contemporary India, see Sharma (2015) and Teltumbde (2018). A recent article in the New York Times (Gettleman and Raj, 2018) provides useful case studies. Bros and Couttenier (2015) show that homicide rates of SC individuals at the district level are positively and significantly correlated with public access to water, but higher caste homicide rates are not so. They interpret this relationship as reflecting the upholding of untouchability rules, which are either violently enforced or serve as an excuse for caste-based violence. Varshney (2002) and Wilkinson, 2005 are notable attempts by political scientists to understand violent Hindu-Muslim conflicts in India, while Mitra and Ray (2014) offer a recent economic analysis of the same. The last contribution has some broad connections with our theoretical model, which we discuss in Section 3.3 below.

practice of untouchability, even as it seeks to impose Hindu values and rituals on religious minorities. There are four communities in our model: SCs, upper castes (Brahmins and Forward castes), OBCs and non-Hindus (Muslims and Christians). Each community is assumed to achieve perfect internal coordination, reflecting the presence of effective within-community governance structures, so that it can be modelled as an individual allocating its resource endowment between material consumption and conflict over behavioural norms, in order to best satisfy its preferences. Village social norms, determined as the equilibrium outcome of the simultaneous interplay of caste and religious contests, determine the cost to an individual from practising untouchability. Hindu upper caste and OBC individuals take this cost as given and decide to practise untouchability if their individual (idiosyncratic) benefit from such behaviour exceeds the cost.[5]

Our model predicts that any increase in the collective resource endowment ('power') of non-SC Hindus within the village, by shifting the outcome of the caste conflict against SCs, will increase the proportion of upper caste or OBC households therein which practise untouchability. The opposite holds for an increase in the power of SCs. Interestingly, any increase in the power of Muslims or Christians will reduce this proportion. This happens due to greater diversion of resources from the caste conflict to the religious conflict by non-SC Hindus in response to such an increase. Even more striking is the prediction that increases in the power of upper castes, relative to that of the OBCs, may reduce the prevalence of untouchability amongst upper castes and OBCs as well. This happens due to free-riding by upper castes on OBCs in both caste and religious conflicts, when the former are significantly resource-poor relative to the latter. In those situations, a marginal redistribution of resources from OBCs to upper castes reduces the allocation by OBCs to the caste conflict, without inducing upper castes to enter that conflict. Thus, upper castes continue to contribute nothing to it. Hence, the outcome of the caste conflict shifts in favour of SCs – more non-SC Hindus choose not to practise untouchability in consequence. A community's resource endowment serves as an empirical proxy for its political power in our model, in that, ceteris paribus, a community fares better in every conflict it engages in whenever its resource endowment increases.

Using rural household-level data from the India Human Development Survey II – 2011–12 (IHDS 2012), we seek empirical confirmation of the comparative static associations predicted by our theoretical model, with regard to the outcome of the caste conflict, i.e., the incidence of untouchability amongst upper caste and OBC Hindus. Data constraints prevent us from empirically examining either the predictions regarding the outcome of the religious conflict, or those regarding conflict intensities and participation patterns, generated by our theoretical analysis. For purposes of empirical scrutiny, we identify a community's resource endowment (or power) with its share of land weighted by its population share at the village level.[6] We find a negative and statistically significant association between the community power, so defined, of both SCs and non-Hindus (Muslims and Christians), and the likelihood of an upper caste or OBC household practising untouchability. The association between the community power of upper castes and OBCs combined and the likelihood of such a household practising untouchability is positive and significant. The estimated relationship between such likelihood and the power of upper castes relative to that of the OBCs is negative at low levels of relative upper caste power, but positive at high levels. Thus, our empirical findings regarding the association between community power and likelihood of an upper caste or OBC household practising untouchability are consistent with the predictions of our theoretical model (though they do not logically suffice to validate the causality claims/mechanisms advanced in the latter).[7] In sum, therefore, we are able to integrate the literature on caste conflict with that on Hindu-Muslim conflict at a theoretical level, apply that integrated theoretical framework to the analysis of untouchability, and generate novel findings with regard to the prevalence of that practice both theoretically and empirically. In so doing, we are also able to address the more general question of how collective political action may affect individual incentives to practise social discrimination. Our analysis thus carries broader methodological implications for investigation of social conflict and discrimination beyond India.

Anderson (2011) and Iverson et al., 2014 consider the effect of caste divisions and caste power on household income of lower castes in villages dominated by upper castes. In foregrounding the importance of village-level caste power in individual behavioural choices, our analysis bears a family resemblance to theirs. We depart from them in addressing untouchability – a dimension unexplored by them. Chauchard (2014) examines whether political quotas for SCs reduce discriminatory intentions of other castes against them,

[5] Dasgupta and Kanbur (2005, 2007), Esteban and Ray (2008, 2011), Caselli and Coleman (2013), Mitra and Ray (2014), Dasgupta (2017), Bakshi and Dasgupta (2018, 2020, 2021) and Dasgupta and Guha Neogi (2018) are examples of recent contributions to the theoretical modelling of ethnic conflict. These however restrict themselves to conflicts between two ethnic groups. Our model extends this literature to simultaneous conflicts across two dimensions involving at least three groups.

[6] Our measure of a community's resource endowment, and its interpretation in terms of that community's political power, are both closely linked to the notion of a 'dominant' caste introduced by Srinivas (1955) and discussed extensively in the sociological and anthropological literatures. Srinivas (1955) defined a 'dominant' caste as that caste which is both numerically strong and wields preponderant economic and political power within the village. Since land ownership is the principal source of economic power in rural India, and numbers matter in India's electoral democracy, numerical strength and land share constitute the key determinants of caste power in this definition. Numerical strength may impact caste power in non-electoral ways as well. Conflicts and production both require the investment of human labour, and deploying caste brethren rather than mercenaries or wage workers from other castes may serve to reduce both moral hazard and adverse selection problems, thereby increasing the caste's efficiency in production as well as contestation. The larger the pool of prospective recruits inside the caste, the greater such gains. Furthermore, ceteris paribus, the larger the size of a caste, the larger the likelihood of it having members in key positions within the state apparatus – the police, the administration and the judiciary. Having caste members in such strategic positions may help a caste consolidate both its material wealth and political strength through partisan capture of the state apparatus. Our multiplicative combination of population and land shares provides a simple way of formalizing and operationalizing the idea that wealth and numbers both matter in inter-group conflicts.

[7] However, the theoretical predictions do not hold up as well empirically if we replace the caste power measure by the unweighted land share or unweighted population share of the community, or even by their ratio.

Table 1
Incidence of untouchability (%) in Indian states.

State	(1) Rural All	(2) Rural More Developed Villages	(3) Urban All (Metro & other urban areas)	(4) Urban Metro
Madhya Pradesh	45.5	41.6	41.1	–
Himachal Pradesh	43.8	33.40	43.5	–
Bihar	41.3	40.55	41.9	–
Rajasthan	35.7	30.92	34.6	–
Uttar Pradesh	35.5	31.36	32.9	50.3
Gujarat	34.9	34.9	29.7	–
Chhatisgarh	33.3	39.92	32.7	–
Uttarakhand	31.6	13.04	31.2	–
India (except Maharashtra, West Bengal and Kerala)	**28.4**	**23.06**	**24.1**	**13.3**
Odisha	25.5	34.02	24.6	–
India (all states)	**24.3**	**19.04**	**21.5**	**8.79**
Karnataka	19.6	16.90	17.2	15.07
Haryana	17.2	19.81	16.4	13.33
Assam	16.5	30.97	25.71	–
Tamil Nadu	15.2	17.72	12.1	5.05
Jharkhand	14.7	12.03	11.2	–
Jammu and Kashmir	12.1	7.69	10.85	–
Punjab	12.1	11.75	11.9	–
Andhra Pradesh	10.2	9.77	8.9	6.25
Maharashtra	**3.2**	**3.33**	**3.1**	**4.77**
WB	**0.9**	**1.33**	**0.9**	**1.06**
Kerala	**0.2**	**0.69**	**0.6**	**–**

Note: Total number of untouchability observations for Rural All is 26,329, of which 12,345 observations pertain to More Developed villages. Total number of observations for Urban All is 14,596, of which 3078 observations belong to Urban Metro.

while Girard (2018) studies how the exclusion of SCs from the use of public roads in rural India is affected by such quotas. Our analysis shares the same broad objective – to identify factors that might reduce discrimination against SCs – but differs in its focus on structural caste power, instead of affirmative action. Bros and Couttenier (2015) draw attention to the role of violence in the enforcement of norms of untouchability, but do not investigate how caste power might influence the extent and consequences of such violence. Sharma (2015) examines violence and property crimes against SCs as well, but without connecting them explicitly or tightly to untouchability.[8] We interpret inter-caste conflict and contestation, including but not limited to outright violence, as the process through which structural caste power affects individual choices regarding the practice of untouchability.

Section 2 offers some preliminary observations from IHDS 2012 regarding the prevalence of the practice of untouchability in rural (relative to urban/metro) areas of India across different states and caste groups. These findings serve as stylised facts for our analytical model-building exercise in Section 3. In Section 4, we report and discuss the regression results that show the results from IHDS 2012 to be consistent with the relevant predictions yielded by our theoretical model. We conclude in Section 5. Detailed proofs of propositions are presented in an appendix.

2. The structure of untouchability in rural India

We begin with a general empirical investigation into the following questions: how extensive is the practice of untouchability in rural India, and how do different communities, defined on the basis of caste and religion, vary with regard to their propensity to engage in this practice?

The India Human Development Survey-II (2011–12) is a nationally representative, multi-topic survey of rural and urban households drawn from across Indian states. It is the first nationwide survey that includes information on whether the respondent households practise untouchability. This information was not available in the India Human Development Survey-I (2004–05). Hence we are unable to exploit the panel dimension of IHDS I and II. Focusing on rural households of the IHDS 2012, we have a sample of over 26000 households drawn from about 1200 villages.[9] The household schedule of the 2011–12 IHDS posed the following question to the primary respondent of each of the enumerated survey households: "Do some members practice untouchability in your household?".

[8] There is a loose connection, in that she considers crimes against SC/ST individuals perpetrated by non-SC/ST individuals that are registered under the so-called Special and Local Laws (SLL). Many offenses included under SLL involve untouchability-related practices. However, other offenses covered under these laws need not necessarily involve untouchability per se. Thus, the category of SLL crimes considered by Sharma (2015) is too broad to imply a strict positive association with untouchability. There is a reporting-related problem as well with assuming a robust positive correlation between reported SLL crimes and the actual prevalence of untouchability-related practices. See Section 3.3 and footnote 20 for a detailed discussion.

[9] The complete IHDS II sample includes 26462 household-level observations from villages (more (12413) or less developed (14049)), metro (3078) urban areas as well as other urban (11518) areas. The numbers in parentheses indicate the household-level observations in each case.

Table 2
Community-specific incidence of practising untouchability (rural all-India).

	Community	(1) Population share (%)	(2) Land share (%)	(3) Population share practising untouchability (%)	(4) Probability of practising untouchability ($\frac{column\ 3\ value}{column\ 1\ value}$)
1	Brahmin	4	7	2.2	0.56
2	Forward Caste	14	25	4.7	0.34
	Upper/General Caste (Brahmin + Forward Caste)	**18**	**31**	**6.9**	**0.38**
3	**OBC**	**35**	**39**	**11**	**0.32**
	(Brahmin + Forward Caste + OBC)	53	70	17.9	0.34
4	ST	9	7	2.2	0.25
5	**SC**	**21**	**11**	**2.2**	**0.11**
6	Muslim	10	11	1.1	0.11
7	Other	7	8	0.6	0.09
8	**Non-Hindus (Muslim + Other)**	**17**	**19**	**1.7**	**0.10**
9	Total (1–7)	100	100	24	0.24

Note: The table shows the community specific incidence of untouchability in the rural sample. Total number of valid household-level observations is 26,329. The figures shown in the table involve rounding approximations.

The answer was recorded as a "Yes/No". We use this information as the key measure of untouchability.

Table 1 shows, for each state, the proportion of respondent households who admitted to practising untouchability, expressed as a percentage of the total number of households interviewed in that state, classified by region. The percentages in Table 1 can thus be interpreted as the likelihood of untouchability being practised, or its incidence, in the major Indian states. As shown in column (1) of Table 1, 24.3% of all rural households in the full sample admitted to practising untouchability in some form. This country-wide incidence however disguises sharp state-level differences. Kerala, West Bengal and Maharashtra appear outliers, in that, at less than 3.5%, the rural incidence of untouchability appears negligible in all these states, as compared to the above 10% incidence registered by the next best performer, Andhra Pradesh (including Telengana).[10] The country-wide incidence accordingly increases to 28.4% if we drop the three outlier states from our sample. With above 40% self-reported levels of incidence, Madhya Pradesh, Himachal Pradesh and Bihar appear the worst performers, with Rajasthan, Uttar Pradesh and Gujarat following close behind, clustered as they are tightly around 35%. Thus, despite a constitutional ban, the practice of untouchability in some form remains extensive on average in the rural areas of every large state except Maharashtra, Kerala and West Bengal. A comparison of the rural (column 1) and urban (column 3) untouchability figures indicates that urban untouchability is somewhat lower in some states though not always. If, however, we focus on the more developed villages (column (2)) or metro urban areas, i.e., urban areas with more than 2 million population (column (4)), the untouchability average goes down drastically.

Clearly, untouchability is a sensitive issue, and so it may be difficult to obtain honest responses from survey households. Our theoretical analysis in Section 3, being a comparative static exercise, will however only concern the direction of change in the incidence of untouchability, not its magnitude. Hence, the possibility of under-reporting *per se* will not create any difficulties for our empirical application of that theoretical analysis in Section 4. So long as the true incidence is a positive monotone function of the reported incidence, i.e., so long as the true untouchability *ranking* between any two situations is identical to that according to reported incidence, measuring one by the other remains innocuous for our purposes. While under-reporting across the board appears quite possible, it is intuitively difficult to see why the extent of under-reporting within rural India would vary systematically in such a way as to generate large-scale rank reversal between real and reported incidence.

Are there important cross-community variations in the incidence of this practice? Our data-set allows us to partition the population into the following communities: (a) amongst Hindus, we have Brahmins, Forward Castes (FC), Other Backward Castes (OBC), Scheduled Tribes (ST), and of course, the victims of the practice of untouchability, viz., Scheduled Castes (SC); (b) amongst non-Hindus, we have Muslims, and Others, i.e. Christians, Sikhs, Parsees, Jains and Buddhists, with Christians forming the largest component. Table 2 presents the community-specific population shares (column 1), land shares (column 2), shares of community households practising untouchability (column 3) and the community-specific likelihoods of practising untouchability (column 4); all for rural areas. Note that the column 4 figures are obtained by dividing column 3 figures by those in column 1.

Table 2 reveals that every rural community practises untouchability to some extent. Strikingly, SCs have about 11% likelihood of

[10] Telengana was carved out of Andhra Pradesh as a separate state in 2014.

practising untouchability themselves. This reflects the continuing hold of caste hierarchies within the SC community itself and the discrimination against certain SC castes practised by other SC castes (see, for example, Kumar and Somanathan, 2017). Muslims and Others, who all profess religions with neither untouchability nor, indeed, a formal caste hierarchy, exhibit similar propensities. However, these communities are all far less likely to practise untouchability than the overall population. STs, who have traditionally been placed outside the Hindu caste hierarchy and constitute the most disadvantaged social group according to almost every social indicator, appear to be about as prone to the practice as the overall population.[11]

Brahmins, Forward castes and OBCs all exhibit much greater susceptibility to the practice than the population as a whole. About a third of the rural OBC population in our sample admitted to practising untouchability. The corresponding proportion for Forward caste households was about a third as well. Thus, rural Forward castes and rural OBCs appear quite similar in their propensity to engage in the practice. Brahmins are most likely to engage in the practice, with almost 6 out of every 10 rural Brahmin households admitting to it. However, the Brahmin population share at about 4% appears too small for them to be considered as the primary driving force behind the practice. Furthermore, the socio-hierarchical, economic and cultural distances between Brahmins and Forward castes are all generally small, compared to those between these communities and the OBCs. Brahmins and Forward castes together constitute the main component of the category officially termed 'General Castes', whose members fall outside the ambit of caste-based affirmative action programs, whereas OBC individuals qualify for such programs (subject to a generous household income ceiling). Accordingly, in our theoretical model in Section 3, we shall model Brahmins and Forward castes as constituting one unified group, while OBCs will be assumed to constitute another. The practice of untouchability will be driven by the combined efforts of these two caste blocs. Non-Hindus will play a passive role, reflecting their low propensities to practise untouchability, as reported in Table 2.

Table 2 further reveals that the caste blocs most susceptible to the practice of untouchability, viz., upper/general castes and OBCs, are also those who own most of the land in rural India. Together, these castes own about 70% of the total land in our sample, but their population share is marginally over 50%. The land share of the upper castes is almost double their population share. Conversely, SCs are the most land-poor community in relative terms – their land share is about half their population share. Since land remains the primary form of wealth in rural India, inequality in the distribution of land largely reflects wider caste-based inequalities in wealth or asset ownership in general.

3. A theoretical model of within-village group conflict over social norms

We now develop a theoretical model to highlight how the inter-community distribution of resources within a village may jointly determine the prevalence of untouchability therein.

3.1. Group conflict and equilibrium determination of village norms

Suppose the population of a village can be partitioned into four communities: Hindu general (or upper) castes (U), Hindu OBCs (B), Hindu SCs (S) and non-Hindus (M). Brahmins and Forward castes together constitute U, while Muslims and Christians are the primary constituents of M. As noted earlier in Section 1 (footnote 2), we leave out STs partly for the sake of simplicity, partly to reflect their largely outsider status in the Hindu social hierarchy, and partly due to their small numbers. We abstract from the issue of preference differences and coordination problems within each community, by assuming that each community can be modelled as an individual.[12] We shall denote by H the set of all non-S Hindu individuals, i.e., all individuals who are either upper caste or backward caste: $H = [U \cup B]$. Each community $i \in \{S, U, B, M, H\}$ is endowed with ρ_i amount of resources. Define $\theta \equiv \frac{\rho_U}{\rho_H}$. The parameter θ measures the extent of *dominance* of upper castes within the non-SC Hindu community (H) in terms of share of community resources, so that $\rho_U = \theta\rho_H$, and $\rho_B = (1-\theta)\rho_H$. Thus, the community resource endowments ρ_S, ρ_M, ρ_H and the upper caste share θ constitute the parameters of our model. We assume that $\rho_S, \rho_M, \rho_H > 0$ and $\theta \in (0,1)$.Community $i \in \{S, U, B, M\}$ can allocate its resource endowment ρ_i between material consumption and conflict with other communities over the sharing of two different extra-economic 'normative' goods. The normative goods are denoted T and R. The amount of each normative good is unity.

The normative good T is to be interpreted as the composite of social norms, rituals and conventions which govern all social interaction within the extended Hindu community, consisting of upper castes, backward castes and SCs. A larger share of this good accruing to the non-SC subgroup, H, implies that the social norms and conventions within the village reflect, to a greater extent, the values and cultural prejudices of upper and backward caste Hindus, as opposed to those of scheduled castes. As noted earlier, the practice of untouchability vis-à-vis the SCs is legitimised by, and is thus a behavioural consequence of, norms of ritual pollution

[11] Thorat and Joshi (2020, p. 40) explain this in the following manner: "The tribes have always owned land and even functioned as independent kingdoms. They would, therefore, understandably consider themselves as being superior to the lowest of the castes, who have no rights whatsoever." We agree with this view. Some groups among Buddhists and Sikhs are recognized by the Government of India as SCs. We cannot rule out the possibility that our sample of SC households contains some Buddhist and Sikh households as well – those who self-identified as SCs rather than Buddhist or Sikh. Muslim or Christian individuals however cannot claim SC status, and Buddhists and Sikhs together constitute less than 2.5% of India's population. The proportion of Buddhists and Sikhs in the SC population in our sample may even be less than their tiny population share, since it seems probable that some of them identified themselves according to their religion rather than as SCs in their survey response. Not much is therefore lost by thinking of the SC bloc as entirely Hindu.

[12] This modelling choice is made for algebraic simplicity. As discussed in Section 3.2(v), fully decentralized decision-making within each community makes no substantive difference to our conclusions.

adopted primarily by non-SC Hindus. Hence, a larger share of T accruing to the H group will be taken to mean greater tolerance or legitimacy of the practice of untouchability within the Hindu community, and consequently, greater segregation of SCs from the daily collective life of upper castes and OBCs. For brevity, we shall term T the *caste* good. The share of the normative good R accruing to M measures the relative extent to which public spaces within the village, and its collective life, accommodate collective acts of symbolic and religious assertion by non-Hindus. We shall term R the *religion* good.

Let $D \equiv \{T, R\}$. The pay-off function of community $i \in \{S, U, B, M\}$ is given by:

$$\pi_i = \sum_{j \in D} g_{ij} V_{ij} + F(n_i) \tag{3.1}$$

where V_{ij} is community i's valuation of the normative good j, g_{ij} is the share of the normative good j accruing to community i, and n_i is that community's material consumption. We shall assume that the function F is increasing, strictly concave and satisfies the standard Inada conditions, i.e., $F' > 0, F'' < 0, \lim_{n_i \to 0} F'(n_i) = \infty$ and $\lim_{n_i \to \infty} F'(n_i) = 0$. We shall also assume that the community valuations of the caste and religion goods satisfy the following restrictions.

Assumption 1. (i) $V_{MT} = 0 < V_{MR}$; (ii) $V_{SR} = 0 < V_{ST}$; (iii) $V_{UT},\ V_{UR} > 0$; (iv) $V_{BT}, V_{BR} > 0$ and (v) $V_{UT} = V_{BT}, V_{UR} = V_{BR}$.

As noted in Section 2 (Table 2), upper castes and OBCs are most prone to practising untouchability, and Muslims/Others the least. Furthermore, the propensity to discriminate for OBCs is about the same as that exhibited by Forward castes. Assumption 1 builds into the model these broad stylized facts. By Assumption 1, M derives no benefit from T. Hence M does not participate in the contest over T. This incorporates the idea that non-Hindus are neutral towards conflicts within the Hindu community. Similarly, S derives no benefit from R, and therefore does not participate in the contest over its division. This builds in the idea that SCs, being confined to the margins of Hindu society, do not identify much with the dominant belief systems of the latter, which legitimize their own marginalization. Consequently, SCs do not share the antagonism towards non-Hindus that a strong and exclusive personal identification with Hindu society typically entails.[13] Both U and B, however, have positive and identical valuations of the two normative goods.[14] They may both, therefore, potentially engage in a contest over the division of T with S and another over the division of R with M.

The division of the caste good, T, between H and S is determined according to the standard Tullock (1980) contest success function:

$$\begin{aligned} g_{ST} &= \frac{x_{ST}}{x_{ST} + x_{HT}} \text{ if } (x_{ST} + x_{HT}) > 0 \\ &= \frac{1}{2} \text{ otherwise;} \end{aligned} \tag{3.2}$$

where x_{ST} and x_{HT} are the amounts allocated by S and H, respectively, to the contest over T; $x_{HT} \equiv x_{UT} + x_{BT}$. We shall denote the total resource allocation to the caste conflict (i.e., $(x_{ST} + x_{HT} + x_{MT})$) by X_T. Similarly, the division of the religious good, R, between H and M is given by:

$$\begin{aligned} g_{MR} &= \frac{x_{MR}}{x_{MR} + x_{HR}} \text{ if } (x_{MR} + x_{HR}) > 0 \\ &= \frac{1}{2} \text{ otherwise;} \end{aligned} \tag{3.3}$$

where x_{MR} and x_{HR} are the amounts allocated by M and H, respectively, to the contest over R; $x_{HR} \equiv x_{UR} + x_{BR}$. We shall denote the total resource allocation to the religious conflict (i.e., $(x_{MR} + x_{HR} + x_{SR})$) by X_R. Furthermore, we shall assume that:

$$g_{UT} = g_{BT} = (1 - g_{ST}); g_{UR} = g_{BR} = (1 - g_{MR}). \tag{3.4}$$

By (3.4), both T and R involve non-rival and non-excludable consumption within the H group (U and B): these are both pure public goods for non-SC Hindus taken as a whole. However, neither U nor B can internalize the benefits accruing from T and R to the other. The two constituents of the non-SC Hindu bloc cannot therefore coordinate their conflict participation with one another. This feature of our model is meant to capture the consequences of deep social cleavages between upper castes and OBCs – social cleavages that both cause and are in turn perpetuated by low levels of inter-marriage.[15] All communities $i \in \{S, U, B, M\}$ simultaneously choose the allocation of their respective resources ρ_i between material consumption and contest expenditures, so as to maximize the pay-off function in (3.1), subject to Assumption 1, the contest success functions (3.2)-(3.4), and the budget constraints:

[13] As we discuss in detail in Section 3.2., both assumptions may be relaxed without substantively altering our conclusions.

[14] The assumption that $[V_{UT} = V_{BT}$, and $V_{UR} = V_{BR}]$ is algebraically convenient but not essential.

[15] These cleavages can and often lead to endemic political conflict between upper castes and OBCs. Our point is not that there is an absence of conflict between upper castes and OBCs, but that such conflict is typically confined to issues separate from untouchability, which constitutes our focus. We discuss in Section 3.2(iv) how explicitly incorporating contests between upper castes and OBCs over issues other than untouchability does not change our conclusions. Similarly, there is a great deal of socio-economic heterogeneity within the OBC bloc, as well as a large element of political conflict among different OBC castes. These qualifications are however tangential to our central concern, namely untouchability, and are therefore abstracted from in our modelling exercise.

$$n_i = \rho_i - x_{iT} - x_{iR}. \tag{3.5}$$

The model outlined above bears a family resemblance to those studied in the literature on conflict in multiple battlefields.[16] As in that literature, one set of combatants (viz., *U* and *B*) maximizes an aggregation of the pay-offs from the different battlefields. However, unlike the standard practice in that literature, the same agents do not confront one another in multiple battlefields in our model – *U* and *B* confront *S* in the conflict over enforcement of norms of ritual pollution and caste hierarchy, whereas they confront *M* over the privileging of Hindu symbols, values and practices over those of other religions. Notice that this departure would obtain even if we permitted SCs to participate in the religious contest alongside non-SC Hindus and non-Hindus to participate in the caste contest against SCs alongside non-SC Hindus. The tripartite structure of our model implies that *S, H* and *M* would all face different enemies on different battlefields, even if all three groups were to participate in both conflicts. This tripartite structure differentiates our model from most of the standard literature on conflicts in multiple battlefields. Furthermore, our model builds in coordination failures within one particular combatant bloc – a feature not usually present in that literature. If we assume that SCs do experience antagonism towards non-Hindus, i.e., $V_{SR} > 0$, then our problem can alternatively be modelled as a variant of those analysing simultaneous between and within group contests (e.g., Hausken, 2005; Münster, 2007; Dasgupta, 2009 and Choi et al., 2016). Our substantive comparative static conclusions will remain unchanged under this alternative formulation, so long as SCs are sufficiently resource-poor relative to non-SC Hindus. We shall discuss these possible variants of our benchmark model in detail in Section 3.2 below.

It is easy to check that the game specified above must have at least one Nash equilibrium. Recalling that $F'' < 0$, $\lim_{n_i \to 0} F'(n_i) = \infty$, $\theta \equiv \frac{\rho_U}{\rho_H}$ and $\rho_H \equiv \rho_U + \rho_B$, (3.1)-(3.5) immediately yield the following observation.

Lemma 1. *Let Assumption 1 hold. Given any* $\rho_H, \rho_S, \rho_M > 0$, *there exist* $\overline{\theta}, \underline{\theta} \in (0,1), \underline{\theta} < \frac{1}{2} < \overline{\theta}$, *such that in any Nash equilibrium: (i)* $[x_{BR}, x_{BT}, x_{MR}, x_{ST} > 0$ *and* $x_{UR}, x_{UT}, x_{SR}, x_{MT} = 0]$ *if* $\theta \in \left[0, \underline{\theta}\right]$, *(ii)* $[(x_{BR} + x_{BT}), (x_{UR} + x_{UT}),\ x_{MR}, x_{ST} > 0$ *and* $x_{SR}, x_{MT} = 0]$ *if* $\theta \in \left(\underline{\theta}, \overline{\theta}\right)$, *and (iii)* $[x_{BR}, x_{BT}, x_{SR}, x_{MT} = 0$ *and* $x_{UR}, x_{UT}, x_{MR}, x_{ST} > 0]$ *if* $\theta \in (\overline{\theta}, 1]$.

Lemma 1 implies that, when upper castes control a relatively small share of non-SC Hindu resources, so that OBCs form the dominant bloc within this group (*H*), the former will free ride on the latter in both religious conflict and caste conflict. The *U* community will allocate its entire resource to its own material consumption. *B* will however allocate positive amounts of resource to both caste and religious contestations. These roles will be reversed when the upper castes are sufficiently more resourceful relative to the backward castes. In the intermediate zone, where the two communities are not too unequal in terms of resource endowment, both will contribute positive amounts to conflict. In these cases, multiple Nash equilibria will exist. The total amount of resources contributed by any community to conflict will be positive and uniquely determinate. However, the division of that deployment between religious conflict and caste conflict will be indeterminate for both *U* and *B*. Obviously, *M* and *S* will always participate in, i.e., contribute positive amounts to, religious and caste conflict, respectively.

In light of the discussion above, Lemma 1 yields the following proposition.

Proposition 1. *Let Assumption 1 hold. Then, given any* $\rho_H, \rho_S, \rho_M > 0$, *there exist* $\overline{\theta}, \underline{\theta} \in (0,1), \underline{\theta} < \frac{1}{2} < \overline{\theta}$, *such that a Nash equilibrium is characterized by the following set of conditions:*

$$\left(\frac{x_{ST}}{{X_T}^2}\right) V_{BT} = \left(\frac{x_{MR}}{{X_R}^2}\right) V_{BR} = min\{F'((1-\theta)\rho_H - x_{BT} - x_{BR}), F'(\theta\rho_H - x_{UT} - x_{UR})\}; \tag{3.6}$$

$$\left(\frac{x_{HR}}{{X_R}^2}\right) V_{MR} = F'(\rho_M - x_{MR}); \tag{3.7}$$

$$\left(\frac{x_{HT}}{{X_T}^2}\right) V_{ST} = F'(\rho_S - x_{ST}) \tag{3.8}$$

and

$$[F'((1-\theta)\rho_H - x_{BT} - x_{BR}) < F'(\theta\rho_H)]\ \textit{if}\ \theta \in \left(0, \underline{\theta}\right),$$

$$[F'((1-\theta)\rho_H - x_{BT} - x_{BR}) = F'(\theta\rho_H - x_{UT} - x_{UR})]\ \textit{if}\ \theta \in \left[\underline{\theta}, \overline{\theta}\right],$$

and

$$[F'((1-\theta)\rho_H) > F'(\theta\rho_H - x_{UT} - x_{UR})]\ \textit{if}\ \theta \in (\overline{\theta}, 1) \tag{3.9}$$

Conditions (3.6)-(3.8) are statements of the first order conditions of *U* and *B, M* and *S*, respectively. Together, (3.6) and (3.9) imply that the marginal utility from expenditure on material consumption must be greater than that on conflict of any kind for *U* in

[16] See Kovenock and Roberson (2012) for a survey.

equilibrium if that community is significantly poorer than B in terms of its resource endowment. Consequently, it will allocate its entire resource to material consumption, free riding on B for access to the two normative goods. B must equate the marginal utility of expenditure on material consumption with those of contributions to both religious and caste conflicts. The opposite will hold when U is sufficiently better endowed than B. When the two communities have broadly similar resource endowments, marginal utilities will be equated across all three items for both B and U. U and B will have identical material consumption in this case. It can be shown that (3.6)-(3.9) imply uniqueness of the equilibrium when either $\theta \in \left(0, \underline{\theta}\right]$ or $\theta \in [\overline{\theta}, 1)$. The equilibrium values of normative good shares g_{ST} and g_{MR} must always be uniquely defined, as well as those of material consumption for all four communities, given the parameters of the model ρ_S, ρ_M, ρ_H and θ. However, when we have $\theta \in \left(\underline{\theta}, \overline{\theta}\right)$, x_{UT}, x_{UR}, x_{BT} and x_{BR} must all be individually indeterminate, leading to multiple Nash equilibria, though $(x_{UT}+x_{UR}), (x_{BT}+x_{BR})$ and $(x_{UT}+x_{BT})$ will all be determinate.

How do changes in communal resource endowments, by impacting the simultaneous group contestations over caste and religion, affect equilibrium acceptability of untouchability, modelled as the equilibrium share of the normative caste good accruing to the SC community (g_{ST})?

Proposition 2 Let Assumption 1 hold, and let ${g_{ST}}^*, {g_{MR}}^*$ be the values of g_{ST} and g_{MR}, respectively, in a Nash equilibrium corresponding to some initial configuration of ρ_H, ρ_S, ρ_M and θ. Suppose further that ${g_{ST}}^*, {g_{MR}}^* < \frac{1}{2}$. Then, ceteris paribus:

(i) *any fall in either ρ_M or ρ_S must reduce the equilibrium value of g_{ST};*
(ii) *any rise in ρ_H must reduce the equilibrium value of g_{ST};*

and

(iii) *there exist $\overline{\theta}, \underline{\theta} \in (0,1), \underline{\theta} < \frac{1}{2} < \overline{\theta}$, such that any rise in θ over $\left(0, \underline{\theta}\right)$ must increase the equilibrium value of g_{ST}, any rise in θ over $\left[\underline{\theta}, \overline{\theta}\right]$ must keep it invariant, while any rise in θ over $(\overline{\theta}, 1)$ must reduce it.*

Proof. See Appendix A.

Proposition 2 refers to an initial equilibrium situation where upper and backward caste Hindus collectively dominate both SCs and religious minorities, in the minimal sense of receiving the larger share of both normative goods. Thus, in the initial situation, the collective social norms governing social interaction within the overall Hindu community in the village embody more caste Hindu beliefs regarding ritual pollution than their negation. Analogously, the collective life of the village is organised more according to the symbols, rituals and practices of non-SC Hindus than those identified with religious minorities. It is easy to see that this must necessarily be the case if the total resource endowment of upper and backward castes is sufficiently greater than those of both SCs and non-Hindus in the village (i.e., if ρ_H is sufficiently greater than $\max\{\rho_S, \rho_M\}$). Then, by Proposition 2(i), any fall in the resource endowment of either non-Hindus or SCs must reduce g_{ST}, i.e., increase the extent to which the practice of untouchability is considered normatively legitimate or acceptable within the village. Any rise in the resource endowment of non-SC Hindus (ρ_H) will have the same effect (Proposition 2(ii)). Perhaps most interestingly, an increase in the share of upper castes in the total resource endowment of non-SC Hindus has a non-monotone impact on village norms legitimizing the practice of untouchability (Proposition 2(iii)). When backward castes are significantly better endowed than upper castes, marginal increases in the resource share of the latter vis-à-vis those of the former makes untouchability less legitimate. Thus, given the total resource endowment of the non-SC Hindu community, a reduction of the dominance of backward castes vis-à-vis upper castes has the effect of making villages norms less tolerant of untouchability. However, when upper castes dominate backward castes in terms of resource endowment, further improvements in their relative resource position causes greater dominance of upper caste ideas of ritual purity, which legitimize the practice of untouchability.

The mechanisms generating the relationships highlighted by Proposition 2 are the following. Any decrease in the resource endowment of non-Hindus permits non-SC Hindus to reallocate some resource from religious conflict to caste conflict. This shifts the outcome of the caste conflict further against SCs. Any decrease in the endowment of the SC community reduces its allocation to the caste contest, thereby reducing the opposition to notions of ritual purity and increasing the legitimacy of untouchability. Any increase in the endowment of the non-SC Hindu community increases its allocation to the caste contest and thereby increases the legitimacy of untouchability. As already noted in Lemma 1 and Proposition 1, when backward castes dominate upper castes sufficiently in terms of resource endowment, the latter withdraw from all conflict, choosing instead to free-ride on the backward castes for access to the normative goods. In such a situation, a marginal redistribution of resources from B to U reduces the ability of OBCs to defend norms of ritual purity against SCs, but does not induce upper castes to enter the caste conflict. Thus, OBCs reduce their allocation to the caste conflict, but upper castes continue to contribute nothing to it. The outcome therefore shifts in favour of SCs - the legitimacy of untouchability declines in consequence. The opposite effect obtains when upper castes dominate backward castes enough to make the latter free-ride on the former. In the intermediate zone, both B and U contribute to conflict. A marginal resource redistribution from, say, B to U, then has no impact on equilibrium consumption bundles: the loser community B reduces its total conflict contribution by

the amount lost, while the gainer community U increases its total conflict contribution by the exact same amount, so that the equilibrium shares and material consumption levels in any post-redistribution equilibrium remain exactly the same as those in any pre-redistribution equilibrium.[17]

Remark 1. An interesting outcome obtains when $g_{MR}^{*} > \frac{1}{2}$ in the initial equilibrium, i.e., non-Hindus dominate non-SC Hindus. Then, as can be easily checked, an increase in the resource endowment of the non-Hindu bloc (ρ_M) induces non-SC Hindus to transfer resources from the religious conflict to the caste conflict. The equilibrium value of g_{ST} falls in consequence – the outcome of the caste conflict shifts against the SCs. This suggests that, in villages dominated by Muslims or Christians, greater resource acquisition by them may increase the extent to which the practice of untouchability is considered normatively acceptableamongst the Hindu population of the village, even if Muslims/Christians themselves remain neutral in the caste conflict. Since very few villages in our sample can be said to be dominated by non-Hindu communities, either numerically or in terms of land shares, we shall ignore this possibility in our empirical analysis presented in Section 4 below. Notice that, by an exactly analogous reasoning, in villages where SCs dominate both upper castes and OBCs ($g_{ST}^{*} > \frac{1}{2}$), greater resource acquisition by SCs may increase the extent to which Hindus dominate non-Hindus, even if SCs themselves do not participate in the religious contestation against non-Hindus.

Remark 2. Given Assumption 1, the equilibrium value of g_{ST} is increasing in ρ_S and decreasing in ρ_H. Analogously, the equilibrium value of g_{MR} is increasing in ρ_M but decreasing in ρ_H. This clarifies the exact sense in which a community's resource endowment can be identified with its political power in our model – other parameters remaining constant, a community fares better in every conflict it engages in whenever its resource endowment increases.

3.2. Variants of the model

(i) We have assumed that SCs derive no benefit from the religious good, i.e., $V_{SR} = 0$ (Assumption 1). This assumption ensures that SCs do not participate in religious conflict, but is not necessary to do so. To see this, suppose instead that $V_{SR} \leq V_{BR}$, and $g_{UR} = g_{BR} = g_{SR}$. Suppose also that $V_{ST} \geq V_{BT}$, with the other restrictions in Assumption 1 remaining unchanged. Given these parametric extensions of our benchmark model, assume S participates in the religious conflict. Then, noting (3.6), we must have:

$$\left(\frac{x_{HT}}{{X_T}^2}\right)V_{ST} = \left(\frac{x_{MR}}{{X_R}^2}\right)V_{SR} = F^{'}(\rho_S - x_{ST} - x_{SR})$$

$$\left(\frac{x_{ST}}{{X_T}^2}\right)V_{BT} = \min\{F^{'}((1-\theta)\rho_H - x_{BT} - x_{BR}), F^{'}(\theta\rho_H - x_{UT} - x_{UR})\} \geq \left(\frac{x_{MR}}{{X_R}^2}\right)V_{BR}.$$

We must therefore have:

$$\left(\frac{x_{ST}}{x_{HT}}\right)\left(\frac{V_{BT}}{V_{ST}}\right) = \frac{\min\{F^{'}((1-\theta)\rho_H - x_{BT} - x_{BR}), F^{'}(\theta\rho_H - x_{UT} - x_{UR})\}}{F^{'}(\rho_S - x_{ST} - x_{SR})} \geq \frac{V_{BR}}{V_{SR}} \geq 1.$$

This yields: (a) $\frac{\min\{F^{'}((1-\theta)\rho_H - x_{BT} - x_{BR}), F^{'}(\theta\rho_H - x_{UT} - x_{UR})\}}{F^{'}(\rho_S - x_{ST} - x_{SR})} \geq 1$, and (since $\left(\frac{V_{BT}}{V_{ST}}\right) \leq 1$) (b) $\left(\frac{x_{ST}}{x_{HT}}\right) \geq 1$. Since $F'' < 0$, (a) implies $(\rho_S - x_{ST} - x_{SR}) \geq max\{(\rho_B - x_{BT} - x_{BR}), (\rho_U - x_{UT} - x_{UR})\}$; i.e., neither upper castes nor OBCs can have higher group material consumption than SCs; (b) implies SCs are not socially dominated by non-SC Hindus ($g_{ST}^{*} \geq \frac{1}{2}$). Thus, SCs can participate in religious conflict only in villages where they are neither socially nor materially dominated by upper castes or OBCs. This is a requirement intuitively difficult to square with an overwhelming majority of India's villages, and one would expect untouchability to be low anyway in the small sub-set of villages where SCs dominate non-SC Hindus both socially and materially. Since the precondition $g_{ST}^{*} < \frac{1}{2}$ is specified in the statement of Proposition 2, the results collated there would remain entirely unaltered even under the more general parametric restrictions discussed in this section. We have therefore simplified the algebra by assuming $V_{SR} = 0$ in our benchmark model – since this does not affect the statement of Proposition 2, nothing of empirical importance is lost thereby. As $\lim_{n_i \to 0} F^{'}(n_i) = \infty$, it is obvious that, given ρ_M, ρ_H and θ, S must withdraw from the religious conflict when ρ_S is below some threshold (though it is tedious to characterize that threshold formally).

(ii) Suppose now that we replace the assumption that non-Hindus derive no benefit from the caste good ($V_{MT} = 0$ in Assumption 1 (i)) by the weaker assumption that $V_{MT} \leq V_{BT}$, and assume that $g_{UT} = g_{BT} = g_{MT}$. Intuitively, this corresponds to a situation where non-Hindus share upper caste and OBC bias against SCs. Suppose further that $V_{MR} \geq V_{BR}$. Then, by an argument exactly analogous to that developed in Section 3.2(i) above, it follows that non-Hindus will participate in the caste conflict only in

[17] This follows immediately from the well-known neutrality property of Cournot games of voluntary contributions to pure public goods, first highlighted in a seminal paper by Bergstrom et al. (1986). See Dasgupta and Kanbur (2007, 2011) for detailed discussions of this property.

villages where they are not dominated by Hindus in the religious conflict ($g_{MR}{}^{*} \geq \frac{1}{2}$). Hence, Proposition 2 remains unchanged. In villages where non-Hindus dominate Hindus in the religious conflict, any increase in the resource endowment of non-Hindus will increase social acceptance of untouchability in our augmented model, but this happens in our benchmark model as well (Remark 1). Thus, no additional predictive power with regard to untouchability is generated by permitting non-Hindus to derive positive psychic benefits from practising untouchability vis-à-vis Hindu SCs.

(iii) Yet another way to model intra-village conflicts might be in terms of a standard model of simultaneous internal vs. external conflict, wherein all Hindu groups contest non-Hindus for a larger share of the religious good, even as the SCs contest non-SC Hindus over the intra-Hindu division. In this formulation, the caste and religious public goods merge into a single composite public good, with valuations $V_i, i \in \{S,M,U,B\}$. Then, if SCs participate in the conflict with non-Hindus, the first order conditions for S yield:

$$\left(\frac{x_{HT}}{X_T{}^2}\right)V_S\left(\frac{X_R - x_{MR}}{X_R}\right) = F'(\rho_S - x_{ST} - x_{SR}) = \left(\frac{x_{ST}}{X_T}\right)\left(\frac{x_{MR}}{X_R{}^2}\right)V_S,$$

with the subscript T now standing for intra-Hindu conflict between SC and non-SC Hindus, and the subscript R standing for conflict between Hindus and non-Hindus, as in our benchmark model. Assuming, as before, that $V_B = V_U$, the first order conditions for the non-SC Hindu groups yield:

$$\left(\frac{x_{ST}}{X_T{}^2}\right)V_B\left(\frac{X_R - x_{MR}}{X_R}\right) = \min\{F'((1-\theta)\rho_H - x_{BT} - x_{BR}), F'(\theta\rho_H - x_{UT} - x_{UR})\} \geq \left(\frac{x_{HT}}{X_T}\right)\left(\frac{x_{MR}}{X_R{}^2}\right)V_B.$$

Combining, we get: $\left[\left(\frac{x_{ST}}{x_{HT}}\right) \geq \left(\frac{x_{HT}}{x_{ST}}\right)\right]$. Thus, SCs will participate in the external conflict with non-Hindus only if they are not dominated in the internal conflict with non-SC Hindus. Hence, the condition under which SCs will participate in the religious, or external, conflict, remains the same as that in the first variant of the benchmark model discussed above (Section 3.2(i)), and therefore similarly unlikely in practice. This offers yet another theoretical justification for viewing the assumption $V_{SR} = 0$ in our benchmark model as not especially limiting in its empirical implications.[18]

Notice that the multiple battlefields structure, adopted both in our benchmark model and its extension in Section 3.2(i), differs fundamentally from the internal vs. external conflict alternative outlined above. In the first, the prize in either battlefield is independent of that in the other, but their valuations are inter-dependant in the second. The intuitive interpretations vary accordingly. In the first, the caste good refers to norms of *individual* intra-Hindu interaction between SCs and non-SCs. The sites of this contestation are fundamentally different from, and independent of, the sites of religious contestation. For example, whether an SC individual is normatively expected to maintain physical distance from upper caste Hindus or is permitted to eat alongside the latter at a wedding banquet is an issue fundamentally independent of questions such as what proportion of communal village land should be set aside for Muslim burials rather than Hindu festivals. The multiple-battlefields structure of our model, with its prizes valued independently of one another, permits us to focus on norms governing individual intra-Hindu interactions, occurring at sites (such as the household or small-scale social gatherings) which are separate from sites of religious conflict. The internal vs. external conflict structure, on the other hand, applies naturally to cases of *group* access, where the sites of conflict are the same, or at least strongly inter-connected. The benefit derived by SC individuals from having a larger proportion of village commons set aside for Hindu festivals can be expected to vary positively with the extent to which they are actually allowed to participate in such festivals. Thus, the different model structures imply differences in intuitive interpretation of the sites or nature of contestations over untouchability. It seems to us that the survey question regarding individual practice of untouchability in our data-set is more likely to capture constraints on inter-personal interaction rather than group access. We have accordingly chosen the multiple-battlefields structure for our model, rather than an internal

[18] Some commentators (e.g., Shani, 2007) have emphasized the part played by "Hindutvaised" SCs in urban areas during the 2002 anti-Muslim violence in Gujarat. However, in their large-scale statistical analysis, Dhattiwala and Biggs (2012) find that violence was actually higher where SCs constituted a smaller proportion of the population. This is consistent with the predictions of our model. They further note that, out of Hindus convicted of killing Muslims in 2002, an overwhelming majority are upper-caste Patidars. Analyzing data from a country-wide electoral survey in 2019, Chibber and Verma (2019, Table 4) find their measures of religious practice, Hindu nationalism and ethno-political majoritarianism all to be the lowest among the group they define as being of 'very low socioeconomic status'. Since SCs are overwhelmingly likely to belong to this category, it seems reasonable to construe this as offering indirect support for the view that SCs, in general, may be less ideologically antagonistic towards Muslims or Christians than upper castes or OBCs. A related issue is the motivation for participation. Our model predicts only that SCs will not allocate resources to conflict with non-Hindus for normative/ideological, i.e., *non-pecuniary*, reasons. It is quite compatible with SCs acting as mercenaries, i.e., selling their labor to upper castes or OBCs, in exchange for monetary/material payment, to be used by the latter in conflicts with non-Hindus. Though we abstract from such market purchases of 'activist labor', analyzed by Esteban and Ray (2011), they can be built into our analysis, at the cost of a major increase in algebraic complexity. They qualify our comparative static conclusions regarding changes in community endowments, by bringing in both income and substitution effects of consequent changes in the price of mercenary labor, but do not necessarily negate them. Similar considerations apply to SCs engaging in direct conflict with non-Hindus over expropriation of pecuniary resources from the latter. Such expropriation is better analyzed via the theoretical model developed by Mitra and Ray (2014) in the context of Hindu-Muslim conflict, which we discuss in detail in Section 3.3 below.

vs. external conflict framework. However, as already discussed, the two modelling strategies yield identical implications in terms of empirically testable comparative static hypotheses.

(iv) One can add another layer to the model by including contestation between upper castes and OBCs over norms, resources, or both. While this greatly increases the algebraic complexity of the exposition, it adds nothing substantive to comparative static insights. When upper castes are resource-weak relative to OBCs, they would free-ride on the OBCs in the contestation against the SCs, as in our benchmark model. A marginal redistribution of resources from the OBCs to the upper castes would then force the OBCs to shift resources from the contestation over untouchability to the contest against the upper castes, even as the upper castes continue to free-ride on the OBCs against the SCs. The equilibrium SC share of the caste good would rise in consequence. The opposite would happen when the upper castes resource-dominate the OBCs. Thus, we would get the same inverted U-shaped relationship between upper caste resource endowment relative to that of the OBCs and the equilibrium SC share of the caste good that our benchmark model yields without any explicit upper caste – OBC conflict (Proposition 2(iii)). The other comparative static implications stated in Proposition 2 would continue to hold as well.

(v) We have abstracted from the issue of internal coordination within communities by modelling them as individuals. Nothing of substance depends on this. One can alternatively specify a fully decentralized version of the model, where community $i \in \{S, U, B, M\}$ consists of L_i individuals, each endowed with $\overline{\rho}_i$ amount of resources. In this version, all individuals k would simultaneously choose their individual allocations as the solution to the problem defined by (3.1)-(3.5), with community resource ρ_i replaced by individual resource $\overline{\rho}_i$ in the budget constraint, collective material consumption n_i replaced by individual material consumption n_{ik}, and total community expenditure on either form of conflict defined simply as the sum of community members' individual contributions. It can then be shown that in the decentralized symmetric Nash equilibrium, individual consumption bundles will depend only on the quadruple of community resource endowments $\rho_S, \rho_U, \rho_B, \rho_M$, with ρ_i defined as $L_i\overline{\rho}_i$ for every community i. The comparative static conclusions, as summarized by Proposition 2, remain unchanged. Thus, the assumption of perfect coordination within communities made in our benchmark model serves to drastically simplify the exposition, but our comparative static conclusions are robust to its replacement by the assumption of fully decentralized, individual-level, decision-making. It is not even necessary that individual resource endowments be uniform within a community, only that they be sufficiently similar to make all community members contribute a positive amount to at least one contest, if at least one community member does so.

3.3. Two related contributions

At this stage, it is helpful to locate our theoretical structure and findings with respect to two recent contributions to the literature on group conflict in India that are germane to our analysis.

Mitra and Ray (2014) lay out a two-group model in which aggressors in each group can initiate a conflict with victims in the other group. In their model, essentially a variation on the 'paradox of power' identified by Hirshleifer (1991), a balanced increase in the incomes of a group leads to unambiguously higher levels of attacks being perpetrated against them. This happens because the benefit from attacking them increases, either because there is more to gain financially, or because the psychic value of expropriating them increases. An increase in incomes, in contrast, reduces attacks perpetrated by that group, because the opportunity cost of time expended on violence (instead of production) increases. In our model, an increase in resources, by reducing the marginal utility from material consumption, reduces the opportunity cost of aggression, thereby increasing it. Intuitively, an increase in the income of a group, say, M, may be expected to have a positive income effect on aggression by M, due to a diminution in the marginal utility of material consumption, as well as a negative substitution effect, due to an increase in the opportunity cost of time allocated to aggression. By assuming expropriation gains and violence cost to be perfect substitutes, through their linear cost-benefit structure for aggression decisions, Mitra and Ray (2014) eliminate the income effect. The implicit assumption of perfect substitutability between labour and non-labour inputs in the conflict technology allows our model to eliminate the substitution effect, so as to concentrate on the income effect. At an intuitive level, their structure is more applicable to aggression against individually held property ('money'), while ours seems more relevant for aggression over public goods which are strictly normal in the standard sense. We believe collective behavioural norms and religious consumption are indeed better theorized in the second way. Since, in our formulation, the net valuation of aggression depends only on own income, income gain by either group does not, by itself, lead to greater aggression against them. Of course, since such income gain makes the gainer group more aggressive, retaliatory violence by their opponents may rise as a second order effect. These considerations open up the following possibility.

Remark 3. As a community, say M, gets richer, it may become more aggressive (or more powerful) in normative or behavioural matters, as predicted by our model (Remark 2), even as it comes to suffer greater aggression against property holdings of its individual members, as predicted by the model in Mitra and Ray (2014). There is no conceptual contradiction in being aggressors in one sphere and, at the same time, victims in another. Both outcomes can occur together in a more general model. In reality, aggressive assertion in

the symbolic-normative sphere often acts as the immediate trigger for property violence against both Muslims and SCs. Conversely, property violence against Muslim or SC individuals often sets off longer-term processes of collective mobilization and identity assertion by their respective communities.[19]

Mitra and Ray (2014) find a positive association between Muslim per-capita expenditure and Hindu-Muslim riots. A rise in the resource endowment of Muslims (i.e., in ρ_M) must increase the total resource expenditure on religious conflict in our model when Hindus dominate Muslims. Thus, their empirical findings are broadly consistent with the predictions of our model. A rise in the Muslim resource base reduces both caste conflict and the practice of untouchability in our model (phenomena not addressed at all in their analysis), even as it increases religious conflict (as in theirs).

Using district level official data on crimes against SCs and STs and per capita consumption expenditures as a proxy for material standard of living, Sharma (2015) finds the incidence, of crimes by non-SC/ST perpetrators against SC/ST individuals, to be positively correlated with the ratio of expenditures of lower castes and tribes to that of upper castes. This relationship is however significant only for violent 'non-body' (i.e., property) crimes. Thus, the relative economic position of SCs/STs has a significant association only with crimes against them by non-SC/STs that are both violent and have the objective of expropriating economic surplus from the victims. As already discussed (recall Remark 3 and footnote 19), there is no conceptual contradiction between SCs becoming more assertive in normative or behavioural matters as their collective resource base improves (as in our model), and, at the same time, suffering more attempts at material expropriation from upper castes or OBCs, as is suggested by the findings of Sharma (2015). The estimated correlation between relative SC/ST per capita consumption expenditure and crimes against SCs/STs by non-SC/STs registered under Special and Local Laws (SLL), which are largely non-violent untouchability related offences with the intention of humiliating members of the lower castes, is not significant. Even if we assume more SLL crimes implies more extensive practice of untouchability (thereby ignoring the important caveats discussed in footnote 20), this insignificance by itself does not create any major intuitive or interpretative problems for us. This is because the numerical strength of SCs/STs, measured by their population share, has a significant negative correlation with SLL crimes against them perpetrated by members of other communities (Sharma 2015;Table 2), as well as non-SLL crimes against both their property and their bodies (Sharma 2015;Table 4). Hence, consistent with our theoretical conclusion, Sharma's empirical findings do lend themselves to the suggestion that greater relative SC community power will reduce the prevalence of untouchability, *provided* the relative numerical strength of SCs is included in some fashion in the measure of their community power. Average SC consumption/income/wealth may not be an appropriate measure of SC power because it does not capture the population size effect. In our empirical analysis in Section 4, we shall accordingly include both its aggregate land share and its population share as determinants of a community's resource endowment, or power, instead of using its average land holding.[20]

3.4. Operationalizing the model

We now proceed to impose additional structure on our model, in order to make its comparative static implications (Proposition 2) open to empirical scrutiny.

The first step involves the construction of an empirical measure for our theoretical variable g_{ST}, which would capture the propensity of upper caste and OBC individuals to practise untouchability. How do village norms arrived at through group contestation affect individual practice of untouchability on part of upper castes and OBCs? We assume that all H (i.e., upper caste and OBC) individuals j take village norms governing the extent of tolerance of untouchability, modelled parsimoniously as the equilibrium value of $(1 - g_{ST})$, as given and act so as to maximize their utility, given by:

$$V_j = v_j - K(g_{ST}) \tag{3.10}$$

where v_j is the idiosyncratic benefit from practising untouchability. The idiosyncratic benefit v_j is distributed according to some distribution function $\breve{H}(v_j)$ defined over support $[0,\bar{v}]$. $\breve{H}(v_j)$ is continuous and differentiable over $(0,\bar{v})$, so that $0 \leq \breve{H}(0) < 1, \breve{H}(\bar{v}) = 1$

[19] In conformity with our model, increasing prosperity among Muslims in Kerala, for example, is widely perceived as having been associated with radical Islamist assertion. The Popular Front of India, the primary political face of this assertion, stands accused of numerous acts of violence, including murder. Emmerich (2020) provides an extensive discussion of this organization, and, more generally, of Muslim-identitarian political assertion in India. For an overview of SC assertion and mobilization, as well as retaliatory violence by other castes, see Pai (2013).

[20] Reporting issues may lead to only a weak correlation between reported SLL crimes and the actual prevalence of untouchability. SC/ST victims of crimes perpetrated by members of other communities may feel emboldened to report such crimes to a greater extent when the latter are, on average, less wealthy and thus less able to inflict punishment. Police officers may be more likely to register complaints by SC/ST victims against upper caste or OBC individuals when the perpetrator community cannot offer large bribes, and/or the victim community can do so. For both reasons, an increase in the per capita consumption of SCs/STs relative to that of upper castes need not reduce the number of crimes against SCs/STs recorded in official statistics even when the total number of such crimes actually goes down. Thus, the statistical insignificance reported by Sharma (2015) does not suffice to rule out a significantly negative relationship between the relative per capita consumption of SC/ST individuals and the true incidence of untouchability. Another major caveat has to do with the offenses included under SLL crimes. While many of such offenses do appear directly related to untouchability, some, such as wrongfully occupying SC/ST land/premises, compelling them to provide bonded/forced labour, etc., involve material expropriation (of land or residential property, and labour, respectively) rather than untouchability per se. Sharma includes such property crimes within her SLL aggregate, which makes it difficult to interpret that aggregate strictly as a (necessarily) robust measure of the prevalence of untouchability-related practices.

and $\breve{H}'(v_j) > 0$. Notice that we permit part of the non-SC Hindu population to derive no benefit from practising untouchability. $K(g_{ST})$ specifies the cost of practising untouchability. The greater the value of g_{ST}, the lower the collective tolerance of untouchability, hence the greater the cost to upper caste and OBC individuals from its practice. We therefore assume $K(0) = 0, K' > 0$ and $K(1) \leq \bar{v}$. It is then clear from (3.10) that the proportion of the upper caste and OBC population within the village that will practise untouchability (i.e., its incidence within the H community) is given by:

$$\mu = 1 - \breve{H}(K(g_{ST})) \equiv \mu(g_{ST}); \tag{3.11}$$

with $[1 \geq \mu(0) = 1 - \breve{H}(0) > 0]$ and $\mu'(g_{ST}) < 0$. The variable μ can be alternatively interpreted as the probability that a randomly chosen non-SC Hindu member of the village will engage in the practice. Note that a positive proportion of the H population may *not* practise untouchability even if it is costless to do so. The proportion of the H population not practising untouchability increases as the SC bloc attains greater success in the caste conflict. We assume that the distribution function $\breve{H}(v_j)$ is identical across all villages. Furthermore, since our data-set provides household level (rather than individual level) responses, we ignore differences in household size and assume that all members of a household value the benefits from practising untouchability equally. The theoretical conclusions presented in Proposition 2 can then be empirically investigated by examining the relationship between μ, interpreted as the likelihood (probability) that a randomly chosen H household will practise untouchability, which is observable in our data-set (rather than g_{ST}, which is not), and empirical proxies for the model parameters ρ_S, ρ_M, ρ_H and θ specified for the village inhabited by this particular household.

Our next step in making the model empirically operational therefore involves defining empirical proxies for the four model parameters, namely, the community resource endowments ρ_S, ρ_M and ρ_H, and the upper caste share of non-SC Hindu resource endowment θ. Denote the land endowment of community i by δ_i and its labour endowment by L_i. We specify the community resource production function as having the symmetric Cobb-Douglas functional form: $\rho_i = A(\delta_i L_i)^{\omega}$, with $A, \omega > 0$, for every community $i \in \{S, M, H\}$. Since ρ_i is then strictly increasing in $\delta_i L_i$, this permits us to use $\delta_i L_i$ as the empirical measure of community power for SCs, non-Hindus and the combined upper caste and OBC Hindu bloc. Furthermore, we assume that: $\theta \equiv \frac{\rho_U}{\rho_H} = \widehat{\theta}\left(\frac{\delta_U L_U}{\delta_H L_H}\right)$, with $\widehat{\theta}(0) = 0, \widehat{\theta}(1) = 1$ and $\widehat{\theta}' > 0$ for every $\left(\frac{\delta_U L_U}{\delta_H L_H}\right) \in (0,1)$. Hence, we can use the ratio $\left(\frac{\delta_U L_U}{\delta_H L_H}\right)$ as the empirical proxy for the parameter θ – as the empirical measure of the extent of *dominance* of upper castes within the non-SC Hindu community (H) in terms of share of community resources.

Lastly, we need to make the model *scale-neutral* for empirical application, since our data-set only provides information regarding the population proportions and land shares of the various communities within a village, not the aggregate population size or total land holding. It can be easily seen from Proposition 1 that this happens under the additional assumption $F(n_i) \equiv \ln n_i$. Given θ, any equi-proportionate change in the community resource endowments ρ_M, ρ_S and ρ_H will leave the equilibrium shares unchanged under this additional assumption. In confronting the predictions of our theoretical model with the empirical evidence, we will deploy this scale-neutral version. Since $[A(\hbar\delta_i L_i)^{\omega} = (\hbar)^{\omega} A(\delta_i L_i)^{\omega}]$ for all $\hbar > 0$, any equi-proportionate change, $\hbar$, in the population weighted land endowments of *S, M* and *H* must change the community resource endowments ρ_M, ρ_S and ρ_H by the same proportion $(\hbar)^{\omega}$. Hence, the scale-neutral version of our model, when combined with our Cobb-Douglas specification of the community resource function, implies that only the land and population *shares* of the communities *S, M* and *H* matter for community power, not the total land or population endowment of the village as a whole.

The additional assumptions imposed on the model discussed above make Proposition 2 fully open to empirical scrutiny, which we shall attempt in Section 4 below.

4. Empirical strategy and findings

We now proceed to test the predictions of our theoretical model, as summarized by Proposition 2 and operationalized via the additional assumptions introduced in Section 3.4. We consider IHDS 2012 rural household-level data, focusing on Hindu non-SC/ST households, to conform to our model. This yields a sample of about 13,000 non-SC/ST Hindu households drawn from about 1100 villages in our estimation sample. Note that the rural IHDS 2012 data is most representative at the household level. We do not seek evidence for either the predictions regarding the outcome of the religious conflict, or those regarding conflict intensities and participation patterns, generated by our theoretical analysis, due to the limitations of our data set.

4.1. Empirical strategy

The key driver of untouchability in our model is a community's relative power. Define $r_i = (\delta_i L_i)$. As discussed in Section 3.4, for each village in our sample, the resource base or power of community H, i.e., of the combined Brahmin, Forward and OBC caste bloc, ρ_H, is empirically proxied by the variable r_H: the population share of H households in that village multiplied by the proportion of the total village land owned by H households therein. For example, if 50% of the population in the village belong to the H category, and H households collectively own 70% of the village land, then the variable r_H will be ascribed a value of 0.35 for that village. This measure will in general vary across villages. Resource endowments of SCs and non-Hindus, as captured respectively by the variables ρ_S and ρ_M in our theoretical model, are proxied analogously, by their respective population shares in the village multiplied by their respective

Table 3
Key explanatory variables at the village-level - definitions and summary statistics.

Variable	Definition	Obs	Mean	Std. Dev.
	Village population shares			
U	Brahmin and Forward population share	1184	0.255177	0.267787
B	OBC population share	1183	0.435567	0.283303
H	$(U + B)$	1183	0.690935	0.225737
S	SC population share	1183	0.212466	0.169005
M	Muslim plus Christian population share	1203	0.084289	0.164987
U_H	U/ H	1178	0.280941	0.317399
	Village land shares			
U_landsh	Land share held by Brahmins and Forwards	1115	0.309327	0.317604
B_landsh	Land share held by OBCs	1115	0.409031	0.31455
H_landsh	(U_landsh + B_landsh)	1115	0.718359	0.248308
S_landsh	Land share held by SCs	1115	0.107955	0.14163
M_landsh	Land share held by Muslims and Christians	1215	0.169951	0.318693
U_H_landsh	U_landsh/H_landsh	1095	0.419251	0.382122
	Key explanatory variables: Measures of community power			
ρ_H	H*H_landsh	1104	0.535175	0.259125
ρ_S	S*S_landsh	1104	0.039095	0.097658
ρ_M	M*M_landsh	1203	0.033759	0.109802
θ	(U *U_landsh)/(H *H_landsh)	1085	0.2661485	0.3323376
	Other village-level control variables X, Z			
	Distance from the nearest town (km)	1206	13.52322	10.53336
	Has outside workers	1215	0.548148	0.497881
	Has all-weather road	1215	0.878189	0.327202
	Has government primary school	1215	0.981893	0.133393
	Has private primary school	1215	0.412346	0.49246
	More developed village	1215	0.472428	0.4994448
	SC Pradhan in a reserved GP	1215	0.026337	0.1602027
	Pradhan is a female	1215	0.403292	0.4907605

shares of total village land.[21] The variable θ is empirically proxied by the ratio $\frac{r_U}{r_H}$ (recall the discussion in Section 3.4). Thus, we shall identify ρ_i with its empirically measurable proxy r_i (where $i \in \{H, S, M\}$), and θ with $\frac{r_U}{r_H}$, in our empirical analysis. We include only Muslims and Christians in the non-Hindu category, dropping the other religious minorities due to their numerical insignificance and localized presence.[22]

Agricultural land in India is largely held within families and therefore within castes. The land market is generally inactive in Indian villages (Mearns, 1999). The land shares held by different caste-based communities can therefore be considered relatively stable over time. Population shares of different communities are also relatively stable over time (Bharti, 2018). We therefore treat our key explanatory variables, i.e., the community's population share weighted land shares, as exogenous to determining the likelihood of untouchability in our sample.

Our key outcome variable is whether members of rural households belonging to the H group exercise untouchability. Accordingly, we determine the likelihood (probability) of the ith household belonging to the H group practising untouchability as follows:

$$P_{ij} = \alpha_0 + \alpha_1 \rho_{Hj} + \alpha_2 \rho_{Sj} + \alpha_3 \rho_{Mj} + \alpha_4 \Sigma_k \theta_{jk} + aX_{ij} + u_{ij} \quad \text{(Eq. 1)}$$

where the subscript j refers to the village inhabited by that particular household i. Our key explanatory variables are the group power of non-SC/ST Hindus, SCs and non-Hindus as captured respectively by $\rho_{\mathrm{H}}, \rho_{\mathrm{S}}$, and ρ_{M}, along with the degree of upper caste dominance within the non-SC/ST Hindu bloc, captured by θ, all referring to the particular village j inhabited by the ith household. These variables are identified for empirical purposes with r_H, r_S, r_M and $\frac{r_U}{r_H}$ respectively (see Table 3). We include θ_{k}, $k = 1,2,3$, to capture the non-monotone relationship between θ and an H household practising untouchability. In particular, we use the decile distribution of θ to generate the following dummy variables: θ_1 refers to the values of θ in the first 2 deciles; θ_2 to values of θ between 7 and 9 th deciles and θ_3 to those for the 10th decile values of θ. Therefore the 3rd to 6th deciles act as our reference category. In Section 4.2.3 below, we check the robustness of this specification by replacing the linear splines of θ by a quadratic function, as an alternative way of searching for a non-monotone relationship between P and θ.

We include a vector of control variables X to minimise the potential omitted variable bias of our estimates. The set X includes the

[21] We also have information on income and expenditure of the households. But we prefer land ownership as a measure of resource base since its historically given character minimises the likelihood of reverse causality. As noted earlier (footnote 6), our measure of a community's resource endowment is closely linked to the notion of a 'dominant' caste, as introduced by Srinivas (1955).

[22] According the latest (2011) Indian Population Census, Sikhs, Jains, Parsees and Buddhists collectively constitute only about 3.5% of the Indian population. At 1.7% of the population, Sikhs make up about half of this group, but they are a negligible proportion of the population in every state except Punjab, where about 80% of them live, accounting for about 60% of that state's population.

Table 3A
Outcome and control variables at the household-level - definitions and summary statistics.

Variable	Definition	Obs	Mean	Std. Dev.
Abbreviations	**Outcome variable**			
Untouchability	Practice of untouchability by Hindu upper castes (non-SC/ST households)	14,031	0.340033	0.473737
	Other control variables			
hh_brahmin	Household Brahmin	14,044	0.07804	0.268245
hh_FC	Household forward caste	14,044	0.253916	0.435266
hh_OBC	Household OBC	14,044	0.652806	0.476095
head_geclass5	Head has at least class 5 education	14,044	0.233837	0.423285
prim_cult	Primary occp: cultivation	14,044	0.465323	0.498814
prim_lab	Primary occp:labour	14,044	0.269581	0.443758
prim_bus	Primary occp:business	14,044	0.077257	0.267009
prim_artisan	Primary occp: artisan	14,044	0.010752	0.103136

village's distance from the nearest town, the presence of outside workers, all-weather roads as well as government and private primary schools. Closeness to a town, good connectivity or the presence of outside workers in a village may enhance villagers' exposure to urban values or other cultures, which in turn may influence the practice of untouchability. Education may, potentially, act as an influence against caste-based discrimination. Furthermore, we include a number of household characteristics: (a) if the household head has at least grade 5 schooling, (b) if the household is Brahmin, Forward caste or OBC, and (c) whether the primary occupation of the household is cultivation, labour, business or artisanal work.

Since our key explanatory variables - the ρs and the θs - are village-level, we cannot include village dummies in the regressions. However, we include district dummies in the control vector X. States and union territories in India are subdivided into districts headed by a civil servant known as District Magistrate. District authorities are responsible for local spending on education, culture, poverty reduction and family welfare. Accordingly, district dummies would account for the unobserved time-invariant district-level variation in local governance that may also influence the outcome of interest.[23] By including them, we can exploit the variation in the practice of untouchability by H households within a district, thereby minimising the influence of inter-district unobserved heterogeneity in our estimates.

To test the robustness of estimates of Equation 1 in the cross-section of villages, we also include additional controls that may influence the likelihood of untouchability and therefore would help minimising the omitted variable bias of our estimates from Equation (1) further. To this end, we include three binary variables, namely, if the Pradhan is SC and elected in reserved GP; if the Pradhan is a female and also if the village is more developed. The 73rd Amendment of the Indian Constitution introduced in 1993 requires that a fraction of seats of the village councils, or 'gram panchayats' (GP) at all levels be reserved for SCs. Since we observe whether the Pradhan (Head of the village council) is an SC elected from a reserved GP in our data, we include it as an additional control to check the robustness of our results. The underlying idea is that, having an SC Pradhan in a GP may improve the collective power of SCs, which in turn may reduce untouchability.[24] Similarly, we construct a second binary variable indicating if the Pradhan is female, in order to see whether reservation for women in GPs matters for local households practising untouchability. Inclusion of SC Pradhan and female Pradhan in a reserved GP, together, would allow us to assess the beneficial role of affirmative action, if any. Finally, IHDS data allow us to demarcate more developed villages from less developed ones. To this end, we include a third binary variable that takes the value 1 if it is a more developed village; it is zero otherwise. More developed villages may experience market-led development, which in turn may weaken or exacerbate caste inequalities (Mosse, 2018). Inclusion of these three additional variables leads us to estimate specification 2, where the set of augmented control variables is represented by Z, as follows:

$$P_{ij} = \beta_0 + \beta_1\rho_{Hj} + \beta_2\rho_{Sj} + \beta_3\rho_{Mj} + \beta_4\Sigma_k\theta_{jk} + \beta_R Reserved + \beta' Z_{ij} + u_{ij}. \quad \text{(Eq. 2)}$$

In Equation (2), the binary variable Reserved indicates the presence of an SC Pradhan in a reserved GP; the set Z includes all variables in X plus female Pradhan and more developed village.

Finally, we explore whether the presence of an SC Pradhan in a reserved GP allows us to isolate its differential impact on untouchability via its effect on the ρ and θ variables. To this end, we interact the binary variable Reserved with all the ρ and θ variables to further augment Equation (2) as follows:

$$\begin{aligned} P_{ij} \quad = \quad & \delta_0 + \delta_1\rho_{Hj} + \delta_2\rho_{Sj} + \delta_3\rho_{Mj} + \delta_{4k}\Sigma_k\theta_{jk} + \delta_R Reserved + \delta_5\rho_{Hj}XReserved \\ & + \delta_6\rho_{Sj}XReserved + \delta_7\rho_{Mj}XReserved + \delta_{8k}\Sigma_k\theta_{jk}XReserved + \delta' Z_{ij} + u_{ij} \end{aligned} \quad \text{(Eq. 3)}$$

We estimate Equations (1)-(3) using household-level data, since IHDS data is most representative at the household-level. As indicated earlier, we do not generate household level estimates with village fixed effects. This is because our key explanatory variables

[23] Due to the limitations of IHDS data, we cannot incorporate such dummies at local administrative levels situated between the district and the village.

[24] This is suggested by findings that electoral reservation for SCs may have positive consequences for them. Chauchard (2014) offers causal evidence that reservations for SCs in GPs affect the psychology of members of other castes, leading to a decrease in their discriminatory intentions against SCs. Girard (2018) finds that such SC quotas in GPs reduce the likelihood of exclusion of SCs from the use of public roads while in operation, though not permanently. Mukherjee et al. (2020) show that in reserved GPs with SC Pradhans, location clusters of SC households receive higher allocations for the provision of metalled road and road-repair activities by the GP.

Table 4
OLS household-level estimates of untouchability by Hindu rural non-SC/ST households using linear splines of θ.

With district FE	Mean (sd)(1)	Equation 1 (2)	Equation 2 (3)	Equation 3 (4)
ρ_H	0.3691	0.1392***	0.1376***	0.1324***
	(0.4156)	(9.10)	(9.01)	(8.53)
ρ_M	0.0184	−0.2748***	−0.2667***	−0.2609***
	(0.0712)	(5.68)	(5.47)	(5.29)
ρ_S	0.0287	−0.2262***	−0.2557***	−0.2466***
	(0.0637)	(6.73)	(7.44)	(6.69)
θ: decile 1 & 2	0.2440	−0.0401***	−0.0395***	−0.0386***
	(0.4295)	(4.96)	(4.89)	(4.73)
θ: decile 7–9	0.1667	−0.0310***	−0.0209**	−0.0193**
	(0.3727)	(3.18)	(2.15)	(1.96)
θ: decile 10	0.0847	0.0565***	0.0582***	0.0554***
	(0.2785)	(3.95)	(4.09)	(3.82)
Household brahmin	0.078	0.2162***	0.2028***	0.2033***
	(0.2682)	(9.49)	(9.03)	(9.01)
Household FC	0.2539	0.1098***	0.1016***	0.1035***
	(0.4352)	(5.57)	(5.22)	(5.29)
Household_OBC	0.6528	0.0960***	0.0898***	0.0903***
	(0.4760)	(5.13)	(4.87)	(4.87)
HH head has at least primary sch	0.2338	0.0011	0.0029	0.0027
	(0.4232)	(0.15)	(0.39)	(0.36)
Primary occp: cultivation	0.4653	0.0069	0.0014	0.0004
	(0.4988)	(0.76)	(0.15)	(0.04)
Primary occp: labour	0.2696	−0.0170*	−0.0177*	−0.0175*
	(0.4437)	(1.73)	(1.81)	(1.79)
Primary occp: business	0.0772	−0.0039	−0.0011	−0.0007
	(0.2670)	(0.29)	(0.08)	(0.05)
Primarly occp: artisan	0.0107	0.0033	0.0119	0.0120
	(0.1031)	(0.10)	(0.36)	(0.36)
Distance from nearest town	13.44	0.0014***	0.0015***	0.0015***
	(10.1077)	(4.27)	(4.69)	(4.54)
Outside workers	0.5432	−0.0198***	−0.0081	−0.0068
	(0.4981)	(2.85)	(1.16)	(0.98)
Pucca road	0.8773	−0.0468***	−0.0222**	−0.0240**
	(0.3280)	(4.29)	(1.99)	(2.14)
Has a govt. primary sch	0.9806	−0.0313	−0.0268	−0.0267
	(0.1378)	(1.10)	(0.94)	(0.94)
Has a pvt primary sch	0.3897	−0.0047	0.0162**	0.0174**
	(0.4877)	(0.68)	(2.26)	(2.41)
Pradhan SC Reserved	0.023		0.0181	−0.1227***
	(0.1488)		(0.83)	(3.01)
Pradhan female	0.400		0.0329***	0.0324***
	(0.489)		(4.96)	(4.89)
More developed village	0.446		−0.0777***	−0.0797***
	(0.4971)		(10.41)	(10.64)
ρ_HxPradhan SC reserved				0.4609***
				(4.68)
ρ_MxPradhan SC reserved				−0.5959***
				(2.84)
ρ_SxPradhan SC reserved				0.0763
				(0.66)
θ: decile 1 & 2xPradhan SC reserved				−0.0576
				(1.10)
θ: decile 7–9x Pradhan SC reserved				−0.0715
				(1.18)
θ: decile 10x Pradhan SC reserved				0.1387**
				(2.08)
Intercept		0.1138***	0.1096***	0.1126***
		(2.76)	(2.66)	(2.73)
District FE		Yes	Yes	Yes
R^2		0.10	0.11	0.11
N		12,760	12,760	12,760

Note: The table shows the household level estimates of untouchability amongst non-SC/ST rural Hindu households. The outcome variable pertains to the household response to TR4A: it takes a value 1 if some household members practise untouchability; it is zero otherwise. Columns (2)-(4) respectively show OLS estimates of untouchability for Equations 1–3, using the joint distribution of population and land shares as a measure of community power; these estimates include district fixed effects. Each equation also controls for other factors including if the household is Brahmin, Forward caste, OBC, if the household has at least five years of schooling, if the household's primary occupation is cultivation, labour, business,

artisan, distance of the village from town, if outside workers come to this village, village's access to pucca road, government and private primary schools. We use robust standard errors. T-statistics are shown in the parentheses: * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

pertain to village-level community power in terms of ρs and θs,amongst other village-level controls. These village-level variables lose variation within a village and sometimes drop out of the regression. This is most likely to happen in estimating Equation (3) that includes a number of interactions with the presence of an SC Pradhan in a reserved GP, thus producing inconsistent results.

All village-level regression variables are defined in Table 3, which also summarises their descriptive statistics. We show the community level means and standard deviations of population and land shares in Table 3 as well. This highlights the fact that a community's land share is not exactly proportional to its population share within a village, thus justifying the use of population weighted land share as the relevant measure of community power in our analysis. The means and standard deviations of household-level regression variables are provided in Table 3A.

4.2. *Empirical findings – household-level estimates*

In light of Proposition 2, under the maintained assumptions introduced in Section 3.4, we test the following hypotheses: (a) in Equation 1, $\alpha_1 > 0, \alpha_2 < 0, \alpha_3 < 0$; and (b) the likelihood of an H household practising untouchability falls at low values of θ, but rises at high values of θ. Hypothesis (a) is an implication of our central idea, micro-founded by Proposition 2((i) and (ii)), that any village-level increase in the power of SCs or non-Hindus, and any village-level decrease in the power of non-SC Hindus, must all be associated with a lower likelihood of H households practising untouchability. We include dummies to represent different deciles of θ meant to approximate its non-monotone impact on untouchability, as micro-founded by Proposition 2(iii) and posited by hypothesis (b) above, and test whether the marginal effect is negative when θ is close to 0, but positive when θ is close to 1.

4.2.1. *Estimates using linear splines of θ*

Household-level estimates with district dummies are summarised in Table 4. Column (1) shows the means and standard deviations of key explanatory variables. Columns (2)-(4) show the household-level estimates with district fixed effects respectively for Equations (1)-(3). These estimates explain the variation in the likelihood of an H household practising untouchability within a district in our rural sample. The likelihood of a rural H household practising untouchability within a district appears to be correlated not only with internal characteristics of that household or aggregate characteristics of the village where the household resides, but, crucially, with the distribution of resources amongst the main communities within that village (and therefore by its communal power structure) as well, in ways predicted by our model.

Column (2) shows that, ceteris paribus, greater power of non-Hindus (largely Muslims) or SCs within the village (i.e., higher ρ_M or ρ_S) is associated with a lower likelihood of upper caste and OBC households practising untouchability therein (Proposition 2(i)) – the estimated coefficients are both negative and statistically significant. The estimated coefficient for ρ_H is positive and statistically significant. Thus, greater power of non-SC/ST Hindus within the village is associated with a higher likelihood of such households practising untouchability (Proposition 2(ii)).

Our theoretical model also predicts the following: given ρ_H, ρ_M and ρ_S, increases in the collective power of upper castes vis-à-vis OBCs (i.e., in the variable θ) will have non-monotone effects on untouchability (Proposition 2(iii)). As discussed earlier, we use the decile distribution of θ to check for such an empirical relationship in our sample, and use the 3rd to 6th deciles as our reference category. As predicted by our model, we find a U-shaped relationship between θ and the propensity of H households to practise untouchability: the estimated coefficient of deciles 1 and 2 together is negative and statistically significant while that of decile 10 is positive and statistically significant. Thus, these estimates are consistent with our hypotheses.

As expected in light of our preliminary analysis (Table 2), we find Brahmin households within the H bloc to be associated with a higher likelihood of practising untouchability within that bloc. Forward caste and OBC households appear to behave similarly with regard to untouchability. However, the education level of the head of the household and most occupations (with the exception of labour) appear not to bear any significant association with the likelihood of an H household practising untouchability. Labouring H households are less likely to practise untouchability in our sample though the effect is only weakly significant at 10% level. The closeness of a village to the nearest town, and the presence of *pucca* (all-weather) roads, which may both indicate a greater exposure to urban value systems, are associated with significantly lower likelihood of untouchability. However, the presence of primary schools within the village, whether public or private, does not appear to make a significant difference.

Would the conclusions change if, instead of population share weighted land shares, we took the land share alone or the population share alone or their ratio, i.e., the normalized per capita land share,[25] as the measure of community power? Table 6 in Appendix B shows the corresponding estimates using Equation (1). It is evident that none of the three alternative empirical proxies for community power generates estimates that are consistent with all our theoretical predictions.

[25] The normalized per capita land share measure of community power falls as a community becomes numerically larger relative to its opponents. This is a crude but simple way of capturing the idea, originally due to Olson (1965), that larger groups are less effective in conflicts with other groups, because of greater internal free-riding and collective action problems. In this case, θ would be empirically measured by the normalized per capita land share of U expressed as a proportion of the normalized per capita land share of H.

Table 4A
Oster test for reservation variables for Equation (2).

	Beta	Beta when delta=0	Beta when delta=1	Beta when delta=0.75	Beta when delta=1.25
Pradhan SC Reserved	0.0181	0.01808	0.01810	0.01809	0.01810
Pradhan female	0.0329	0.03286	0.03286	0.03286	0.03286

Note: The table tests the stability of the treatment effects (a la Oster, 2017) of Pradhan SC Reserved and Pradhan Female for varying values of relative degree of selection as proxied by delta. We calculate a range of bias adjusted beta values for the selected variables with varying delta=0, 1, 0.75, 1.25 where delta=1 means equal selection. These estimates remain remarkably stable, thus establishing the robustness of the estimates.

4.2.2. Robustness tests

Equation 2 estimates - Including additional controls. We now test the robustness of our baseline estimates of Equation (1) by estimating Equation (2) which includes three additional controls, namely, if the Pradhan is SC and elected in a reserved GP, if the Pradhan is female and also if it is a more developed village. Column (3) of Table 4 confirms the robustness of our key estimates (i.e., those pertaining to the ρ and θ variables) presented in column (2). Having villages with an SC Pradhan in a reserved GP appears not to matter for untouchability - the estimated coefficient of the new dummy variable SC Pradhan in a reserved GP is positive but statistically insignificant. The insignificance is probably due to the fact that only about 2.6% of village Pradhans in our sample are in SC reserved GPs. Presence of female Pradhan appears to be associated with higher untouchability. This is not surprising since 99% of these female Pradhans are non-SC.[26] Higher level of development of the village is associated with lower untouchability.

We also conducted the Oster (2017) test for coefficient stability with respect to the variables Pradhan SC in a reserved GP and Pradhan female, both of which capture affirmative action measures launched by the government of India. Table 4A establishes the relative stability of the treatment effects of Pradhan SC Reserved and Pradhan Female for varying values of the relative degree of selection as proxied by delta. We calculated a range of bias adjusted beta values for the selected variables with varying delta=0, 1, 0.75, 1.25 where delta=1 means equal selection. These estimates remain remarkably stable, thus establishing the robustness of these treatment effects with respect to Pradhan SC in a reserved GP and also Pradhan female.

Equation 3 estimates: including interactions with SC Pradhan Reserved. Column (4) of Table 4 shows the estimates as per Equation (3), which includes interactions of the key explanatory variables with the binary variable SC Pradhan Reserved. The estimated coefficient of SC Pradhan Reserved now turns negative and statistically significant. The non-interacted estimates of ρs and θs remain similar to our baseline estimates in column (2) implying that untouchability in villages without reservation for an SC Pradhan is consistent with the predictions of our theoretical model. The interacted estimates tend to be largely insignificant, though they have the appropriate sign when statistically significant.

In sum, the estimates presented in Table 4 are consistent with the predictions of our theoretical model, irrespective of the regression specification chosen.

4.2.3. Estimates using quadratic θ

We now re-estimate Equations 1–3 using a quadratic specification ($a_1\theta + a_2\theta^2$) to capture the impact of the relative power of upper castes vis-à-vis OBCs (proxied by the variable θ), instead of the linear spline specification deployed earlier. This offers an alternative way of testing whether the *U*-shaped relationship between untouchability and θ predicted by our theoretical analysis is consistent with the data. This exercise may therefore be intuitively viewed as an additional robustness test of the empirical patterns laid bare by our earlier investigation.

The corresponding estimates are presented in Table 5 below. Evidently, these estimates are consistent with all our conjectures about ρs and θ. As before, the estimated coefficients of ρ_M and ρ_S are both negative and significant, while that for ρ_H is positive and significant. Additionally, there is further confirmation of a *U*-shaped relationship between θ and the likelihood of an *H* household practising untouchability. The estimated coefficient of θ is negative, while that of the square of θ is positive; both these estimated coefficients are statistically significant. Furthermore, the absolute value of the former is lower than the latter. Hence, the estimated net effect (on the likelihood of an *H* household practising untouchability) of a marginal increase in θ is negative when θ is below a threshold value, but positive otherwise. The results from the corresponding Oster test are presented in Table 5A below – these are qualitatively very similar to those presented in Table 4A.

Table 7 in Appendix B shows the corresponding estimates of Equation (1) using a quadratic fit for θ. As with Table 6, none of the three alternative empirical proxies for community power generates estimates that are consistent with all of our theoretical predictions.

Since we have not carried out explicit causality tests, the empirical associations presented in this section do not allow us to draw any strong inference regarding the direction of causality. We have hypothesised certain causal mechanisms in our theoretical model, and deduced their implications for the relationship between the intra-village distribution of community resource endowments (or power) and the incidence of untouchability. Our empirical analysis has unearthed statistically significant patterns in that relationship within our data-set which are consistent with, and can therefore be explained or *rationalized* by, the operation of our hypothesised causal mechanisms. These patterns however seem difficult to rationalize from any perspective that views a household's decision to practise

[26] This is why we have not interacted the Pradhan Female dummy with the key explanatory variables in Equation (3). But note that there are 32 villages with an SC Pradhan in a reserved GP of whom 5 are female.

Table 5
OLS household-level estimates of untouchability by Hindu rural non-SC/ST households using quadratic fit for θ.

	Equation 1	Equation 2	Equation 3
ρ_H	0.1228***	0.1231***	0.1195***
	(7.83)	(7.88)	(7.54)
ρ_M	−0.2600***	−0.2506***	−0.2511***
	(5.28)	(5.01)	(5.01)
ρ_S	−0.2716***	−0.3035***	−0.2964***
	(7.77)	(8.47)	(7.68)
θ	−0.1655***	−0.1513***	−0.1562***
	(4.28)	(3.92)	(3.98)
θ^2	0.2392***	0.2295***	0.2319***
	(5.73)	(5.52)	(5.45)
Household brahmin	0.2221***	0.2112***	0.2115***
	(9.39)	(9.07)	(9.04)
Household FC	0.1143***	0.1094***	0.1110***
	(5.52)	(5.37)	(5.40)
Household_OBC	0.1014***	0.0973***	0.0975***
	(5.18)	(5.06)	(5.04)
HH head has at least primary sch	0.0019	0.0036	0.0031
	(0.25)	(0.48)	(0.41)
Primary occp: cultivation	0.0064	0.0011	−0.0003
	(0.70)	(0.12)	(0.03)
Primary occp: labour	−0.0169*	−0.0176*	−0.0180*
	(1.72)	(1.79)	(1.83)
Primary occp: business	−0.0033	0.0002	−0.0003
	(0.25)	(0.01)	(0.02)
Primarly occp: artisan	0.0042	0.0141	0.0138
	(0.13)	(0.43)	(0.42)
Distance from nearest town	0.0015***	0.0016***	0.0016***
	(4.55)	(4.96)	(4.91)
Outside workers	−0.0187***	−0.0064	−0.0058
	(2.68)	(0.92)	(0.82)
Pucca road	−0.0403***	−0.0143	−0.0138
	(3.65)	(1.27)	(1.22)
Has a govt. primary sch	−0.0294	−0.0239	−0.0239
	(1.04)	(0.84)	(0.84)
Has a pvt primary sch	−0.0028	0.0192***	0.0198***
	(0.41)	(2.68)	(2.76)
Pradhan SC Reserved		0.0242	−0.1885***
		(1.07)	(4.94)
Pradhan female		0.0312***	0.0309***
		(4.70)	(4.66)
More developed village		−0.0814***	−0.0832***
		(10.90)	(11.12)
ρ_HxPradhan SC reserved			0.4260***
			(4.10)
ρ_MxPradhan SC reserved			−1.2625**
			(2.06)
ρ_SxPradhan SC reserved			−0.0728
			(0.61)
θxPradhan SC reserved			0.4992**
			(2.35)
θ^2xPradhan SC reserved			−0.2328
			(1.22)
Intercept	0.1069***	0.0979**	0.0971**
	(2.59)	(2.37)	(2.34)
District FE	Yes	Yes	Yes
R^2	0.09	0.10	0.11
N	12,715	12,715	12,715

Note: The table shows the household level estimates of untouchability amongst non-SC/ST rural Hindu households with village fixed effects. In each column, the outcome variable pertains to the household response to TR4A: it takes a value 1 if some household members practise untouchability; it is zero otherwise. Columns (1)-(3) respectively show household-level OLS estimates of untouchability for Equations 1–3 with district fixed effects, using the joint distribution of population and land shares as a measure of community power. Each specification also controls for other factors including if the household head has at least five years of schooling, if the household's primary occupation is cultivation, labour, business, artisan, distance of the village from town, if outside workers come to this village, village's access to pucca road, government and private primary schools. We use robust standard errors. T-statistics are shown in the parentheses: * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

Table 5A
Oster test for household model with district FE for Equation (2) in Table 5.

	Beta	Beta when delta=0	Beta when delta=1	Beta when delta=0.75	Beta when delta=1.25
Pradhan SC Reserved	0.0242	0.02416	0.02416	0.02416	0.02416
Pradhan female	0.0312	0.03117	0.03117	0.03117	0.03117

Note: The table tests the stability of the treatment effects (a la Oster, 2017) of Pradhan SC Reserved and Pradhan Female for varying values of relative degree of selection as proxied by delta. We calculate a range of bias adjusted beta values for the selected variables with varying delta=0, 1, 0.75, 1.25 where delta=1 means equal selection. These estimates remain remarkably stable, thus establishing the robustness of the estimates.

untouchability as driven only by its own characteristics, independently of the intra-village distribution of land and population – of power – across caste and religious groupings. Nonetheless, there may exist causal mechanisms and processes other than the ones hypothesized in our theoretical model that rationalize the empirical associations between untouchability and community power highlighted in this section as well as our model, or better. We cannot rule out their existence. As such, we view the empirical investigation in this section as merely unearthing certain interesting patterns in our data-set which can be rationalized by our theoretical framework, thereby attesting to the possible usefulness of the latter as a tool for organising further empirical research, rather than as providing definitive evidence of any causal relationships.

5. Concluding remarks

This paper examines the possible role played by village-level community power in influencing the practice of untouchability amongst upper and backward caste Hindus in rural India. In so doing, it identifies caste and religion as two identities prone to group conflict and offers theoretical micro-foundations for the idea that the distribution of economic resources that define a community's power shapes investment in these conflicts. Using a parsimonious model of tripartite conflict, we have formalized the idea that a Hindu upper or backward caste household's propensity to practise untouchability vis-à-vis Hindu 'scheduled' castes is determined not solely by its own characteristics but, crucially, also by the inter-group distribution of resources across both caste and religious divides. In our model, such inter-group resource distribution affects the prevalence of untouchability via village-level conflicts over collective assertions of both caste and religious identities. Identifying a community's resource endowment (or power) with its population weighted land share, we have offered evidence consistent with the predictions of our theoretical model, with regard to the association between community power and the incidence of untouchability, using rural household-level data from the India Human Development Survey II – 2011–12. We find robust evidence of an increase in the power of either SCs or Muslims/Christians, or a decrease in that of non-SC/ST Hindus, being associated with a statistically significant reduction in untouchability. We also find robust evidence that a marginal increase in the power of upper castes in villages relative to that of OBCs is associated with a significant reduction in untouchability at low levels of relative upper caste power, but a significant expansion at high levels. As far as we know, ours is the first paper to foreground relative community power, empirically measured by the population weighted land distribution across communities, as possibly a key determinant of the incidence of untouchability in rural India.

We have offered a theory of the joint determination of caste and religious conflicts. However, due to data constraints, we have confined ourselves to examining only the outcome of caste conflict at an empirical level. Future work, using richer data-sets, whether singly or in combination, may usefully examine empirical outcomes of both conflicts, as well as testing the predictions of the model regarding conflict intensities and participation patterns. While our theoretical analysis hypothesizes a causal relationship between community power and untouchability, our empirical analysis does not address the direction of causality. Future work may usefully seek to develop theoretical frameworks that provide alternative rationalizations, and investigate whether they perform better than ours in empirical applications. Outcomes of caste conflicts other than untouchability (our sole empirical focus in this paper), such as market discrimination and differential contract enforcement, may constitute another avenue of application. Lastly, the practice of untouchability in urban contexts – an issue we have left entirely unexamined – deserves investigation.

Our theoretical structure, with its foregrounding of collective political action and group power determined according to the inter-group distribution of material and human resources, can evidently be applied to the analysis of social discrimination across identity divides in different country contexts. Much of the theoretical literature on ethnic group conflict focuses on modelling bilateral conflict. Our analysis, in both its theoretical and empirical articulations, draws attention to the community power of 'third parties' such as Muslims and Christians, as well as social cleavages between upper and backward caste Hindus, to explain much of the incidence of untouchability in rural India. Analogous investigations, of how the power of one ethnic group affects social divisions and interactions within/amongst *other* ethnic groups, may yield important insights. To illustrate, Nigeria has a long history of conflict between Muslims and Christians, the latter being roughly three quarters Protestant and one quarter Catholic. Lebanon's tortuous political history can be viewed as essentially a process of contestation amongst Muslims more or less equally fragmented into Shias and Sunnis and Christians split into a Maronite plurality and a large Greek Orthodox minority, alongside numerous other smaller groups. Sunni Muslims in Syria are further divided into Kurds and Arabs, while Alawites and Christians constitute large minorities, alongside smaller groups. Social conflict in Iraq has often been driven by a contestation between Kurds and Arabs, with the latter antagonistically fragmented into Shia and Sunni blocks. In all these, historically conflict-prone, cases of multiple and overlapping identity divisions, application of context-specific variants of our theoretical framework may yield interesting insights about the determinants of both social discrimination and inter-community conflict.

Acknowledgement

We thank Editor Timur Kuran and two anonymous referees for numerous helpful comments and suggestions. We have also benefited greatly from comments by Anita Dixit, Bibhas Saha, Dripto Bakshi and seminar participants at Jadavpur University, Visva-Bharati University and the Institute of Economic Growth, Delhi.

Appendix A

Define $X_R \equiv x_{MR} + x_{HR}, X_T \equiv x_{ST} + x_{HT}$. We shall prove Proposition 2 via the following lemma.

Lemma 2. *Let Assumption 1 hold and let* ${g_{ST}}^*, {g_{MR}}^*$ *be the values of* g_{ST} *and* g_{MR}*, respectively, in some initial Nash equilibrium. Suppose further that* ${g_{ST}}^*, {g_{MR}}^* < \frac{1}{2}$*. Then:*

(i) *given* ρ_S*, if a marginal change in any of the other parameters* ρ_M, ρ_H *and* θ *generates an increase (resp. decrease) in the equilibrium value of* $\left(\frac{x_{MR}}{{X_R}^2}\right)$*, then* x_{HT} *must fall (resp. rise), and* x_{ST} *rise (resp. fall) in the new equilibrium;*

(ii) *given* ρ_S*,* ρ_H *and* θ*, a marginal increase in* ρ_M *must imply a rise in the equilibrium values of both* x_{MR} *and* $\left(\frac{x_{MR}}{{X_R}^2}\right)$.

Proof of Lemma 2.

Let Assumption 1 hold. Then, by Proposition 1, every Nash equilibrium must satisfy conditions (3.6)-(3.9). Suppose ${g_{ST}}^*, {g_{MR}}^* < \frac{1}{2}$. Then, by (3.2)-(3.3), we must have, in the initial equilibrium:

$$x_{HT} > x_{ST}, x_{HR} > x_{MR}. \tag{N1}$$

It can be easily checked that: given any $a, b > 0, \frac{\partial\left[\frac{a}{(a+b)^2}\right]}{\partial a} < 0 (\text{resp.} > 0)$ iff $a > b$ (resp. $< b$). (N2)

(i) Given ρ_S, suppose a marginal change in any of ρ_M, ρ_H and θ generates an increase (resp. decrease) in the equilibrium value of $\left(\frac{x_{MR}}{{X_R}^2}\right)$. Then, from (3.6), $\left(\frac{x_{ST}}{{X_T}^2}\right)$ must rise (resp. fall) as well. By (N1)-(N2), $\frac{\partial\left(\frac{x_{ST}}{{X_T}^2}\right)}{\partial x_{ST}} > 0$. If x_{HT} does not fall (resp. rise) but $\left(\frac{x_{ST}}{{X_T}^2}\right)$ rises (resp. falls), then x_{ST} must rise (resp. fall). By (N1)-(N2), $\frac{\partial\left(\frac{x_{HT}}{{X_T}^2}\right)}{\partial x_{HT}} < 0$, and $F'' < 0$.Therefore, given ρ_S, if x_{HT} does not fall (resp. rise) even as x_{ST} rises (resp. falls), then (3.8) cannot hold. Hence, x_{HT} must fall (resp. rise). But, by the same argument as before, if x_{HT} falls (rises), then, from (3.8), x_{ST} must rise (resp. fall).

(ii) Given ρ_S, ρ_H and θ, suppose a marginal increase in ρ_M does not produce a rise in the equilibrium value of x_{MR}. Then, since by assumption $F'' < 0$, the RHS of (3.7) must fall. By (N1)-(N2), $\frac{\partial\left(\frac{x_{HR}}{{X_R}^2}\right)}{\partial x_{HR}} < 0$. Then, by (3.7), x_{HR} must rise. By (N1)-(N2), $\frac{\partial\left(\frac{x_{MR}}{{X_R}^2}\right)}{\partial x_{MR}} > 0$. Thus, if x_{MR} does not rise and x_{HR} does rise, then $\left(\frac{x_{MR}}{{X_R}^2}\right)$ must fall. Hence, by (3.6) and (3.9), $\left(\frac{x_{ST}}{{X_T}^2}\right)$ must fall as well. Recall that, by (N1)-(N2), $\frac{\partial\left(\frac{x_{ST}}{{X_T}^2}\right)}{\partial x_{ST}} > 0$. Hence, if x_{HT} does not rise but $\left(\frac{x_{ST}}{{X_T}^2}\right)$ falls, then x_{ST} must fall. But if x_{ST} falls, since $F'' < 0$, the RHS of (3.8) must fall, given ρ_S. This cannot satisfy (3.8) when x_{HT} does not rise but x_{ST} falls, since, by (N1)-(N2), $\frac{\partial\left(\frac{x_{HT}}{{X_T}^2}\right)}{\partial x_{HT}} < 0$. Hence, x_{HT} must rise, along with x_{HR}. Since $F'' < 0$, this implies that, the RHS of (3.6) must rise. However, we have already established that $\left(\frac{x_{ST}}{{X_T}^2}\right)$ must fall. In light of (3.6), we then have a contradiction, which establishes the claim that a marginal increase in ρ_M must generate a rise in the equilibrium value of x_{MR}.

Now suppose x_{MR} rises, but $\left(\frac{x_{MR}}{{X_R}^2}\right)$ does not rise. Then, since, by (N1)-(N2), $\frac{\partial\left(\frac{x_{MR}}{{X_R}^2}\right)}{\partial x_{MR}} > 0$, x_{HR} must rise. However, recalling (3.6) and (3.9), since $\left(\frac{x_{MR}}{{X_R}^2}\right)$ does not rise, and since $F'' < 0$, neither $(\rho_B - x_{BT} - x_{BR})$ nor $(\rho_U - x_{UT} - x_{UR})$ can fall, given ρ_H and θ. Thus, $(x_{HT} + x_{HR})$ cannot rise. Then, since x_{HR} rises, x_{HT} must fall. Now, by (3.6) and (3.9), if $\left(\frac{x_{MR}}{{X_R}^2}\right)$ does not rise then $\left(\frac{x_{ST}}{{X_T}^2}\right)$ cannot rise either. Since, by

(N1)-(N2), $\frac{\partial\left(\frac{x_{ST}}{X_T^2}\right)}{\partial x_{ST}} > 0$, it follows that x_{ST} must also fall if x_{HT} falls. However, given ρ_S, a simultaneous decline in both x_{ST} and x_{HT} is incompatible with the satisfaction of (3.8), since $F'' < 0$ and $\frac{\partial\left(\frac{x_{HT}}{X_T^2}\right)}{\partial x_{HT}} < 0$ by (N1)-(N2). This contradiction establishes part (ii) of Lemma 2.

Proof of Proposition 2.

Let Assumption 1 hold. Then, by Proposition 1, every Nash equilibrium must satisfy conditions (3.6)-(3.9). Suppose further that $g_{ST}^*, g_{MR}^* < \frac{1}{2}$, so that (N1) holds.

(i) Noting (3.2), that the equilibrium value of g_{ST} falls with any decline in ρ_M follows immediately from Lemma 2. To show that g_{ST} falls with any decline in ρ_S, we need to establish the following:

given ρ_H, ρ_S and θ, a marginal decline in ρ_M must reduce the equilibrium value of $(\rho_M - x_{MR})$. (N3)

Suppose not. Then, since $F'' < 0$, and since, by Lemma 2(ii), x_{MR} must decline with a fall in ρ_M, from (3.7), recalling that $\frac{\partial\left(\frac{x_{HR}}{X_R^2}\right)}{\partial x_{HR}} < 0$ by (N1)-(N2), we can conclude that x_{HR} must rise. But then $\left(\frac{x_{MR}}{X_R^2}\right)$ must fall, and hence, since $F'' < 0$, by (3.6) and (3.9), neither $(\rho_B - x_{BT} - x_{BR})$ nor $(\rho_U - x_{UT} - x_{UR})$ can fall and at least one must rise. Given ρ_H, this implies $(x_{HT} + x_{HR})$ must fall. Thus, since x_{HR} increases, x_{HT} must fall. Since, by (3.6), $\left(\frac{x_{ST}}{X_T^2}\right)$ must fall as well, recalling that $\frac{\partial\left(\frac{x_{ST}}{X_T^2}\right)}{\partial x_{ST}} > 0$ by (N1)-(N2), this implies x_{ST} must fall. However, since $F'' < 0$, and $\frac{\partial\left(\frac{x_{HT}}{X_T^2}\right)}{\partial x_{HT}} < 0$ by (N1)-(N2), (3.8) cannot hold if x_{ST} and x_{HT} both decline with ρ_S held constant. This contradiction establishes (N3). By Lemma 2(ii), given ρ_S, ρ_H and θ, a marginal decline in ρ_M must reduce $\left(\frac{x_{MR}}{X_R^2}\right)$ as well. Then, by (3.6) and (3.9), $min\{F'(\rho_B - x_{BT} - x_{BR}), F'(\rho_U - x_{UT} - x_{UR})\}$ must fall. By (N3), since $F'' < 0$, the decline in ρ_M must raise $F'(\rho_M - x_{MR})$. Thus, if ρ_M declines, then $\frac{min\{F'(\rho_B - x_{BT} - x_{BR}), F'(\rho_U - x_{UT} - x_{UR})\}}{F'(\rho_M - x_{MR})}$ declines as well. Using (3.6)-(3.7), we have:

$$\frac{x_{MR}}{x_{HR}} = \frac{min\{F'(\rho_B - x_{BT} - x_{BR}), F'(\rho_U - x_{UT} - x_{UR})\}}{F'(\rho_M - x_{MR})}. \quad \text{(N4)}$$

Recalling (3.3), it follows from (N4) that the equilibrium value of g_{MR} falls in consequence of a marginal fall in ρ_M from any initial situation where $g_{MR} < \frac{1}{2}$, given ρ_S, ρ_H and θ. Hence, starting from an initial situation where $g_{MR} < \frac{1}{2}$, any fall in ρ_M must reduce the equilibrium value of g_{MR}. Then, by an exactly analogous argument, it must be that the equilibrium value of g_{ST} falls with any decline in ρ_S.

(ii)-(iii)We first show that: given ρ_S, ρ_M, the equilibrium value of $\left(\frac{x_{MR}}{X_R^2}\right)$ must fall if there is either an increase in ρ_H (given θ) or a decrease in θ (given ρ_H) over $\left(0, \underline{\theta}\right)$. (N5)

Suppose not. Then, by (3.6) and (3.9), recalling that $F'' < 0$, at least one of x_{HT}, x_{HR} must increase. Without loss of generality, suppose x_{HT} increases. If $\left(\frac{x_{MR}}{X_R^2}\right)$ does not fall, then, by (3.6), $\left(\frac{x_{ST}}{X_T^2}\right)$ cannot fall either. Hence, since, by (N1)-(N2), $\frac{\partial\left(\frac{x_{ST}}{X_T^2}\right)}{\partial x_{ST}} > 0$, it follows that if x_{HT} increases, x_{ST} must rise as well. Thus, if (N5) does not hold, then a rise in ρ_H (given θ) or a decline in θ over $\left(0, \underline{\theta}\right)$ (given ρ_H) must both imply an increase in the equilibrium values of x_{HT} and x_{ST}. However, as $\frac{\partial\left(\frac{x_{HT}}{X_T^2}\right)}{\partial x_{HT}} < 0$ by (N1)-(N2)) and $F'' < 0$, (3.8) cannot hold if both x_{HT} and x_{ST} rise from their initial equilibrium values, given ρ_S. This contradiction establishes (N5). Now note the following: given ρ_S, ρ_M and ρ_H, the equilibrium value of $\left(\frac{x_{MR}}{X_R^2}\right)$ must fall with an increase in θ over $(\overline{\theta}, 1)$. (N6)

Recall that, by Proposition 1, if $\theta \in (\overline{\theta}, 1)$, then $x_{BT}, x_{BR} = 0$ in equilibrium. Condition (N6) then follows by an argument exactly analogous to that used to establish (N5). Lastly, recalling footnote (17), it can be shown that: given ρ_S, ρ_M and ρ_H, the equilibrium values of g_{ST} and g_{MR} must both remain invariant with respect to any change in θ over $\left[\underline{\theta}, \overline{\theta}\right]$. (N7)

Together, Lemma 2(i), (3.2) and (N5), (N6) and (N7) yield parts (ii) and (iii) of Proposition 2.

Appendix B

Table 6 and Table 7.□

Table 6.
Alternative measures of community power – Household estimates of untouchability with district FE, using linear splines of θ.

With district FE	Population share	Land share	Land share per capita
ρ_H	0.3234***	0.0179	−0.0053
	(7.78)	(0.33)	(1.49)
ρ_M	−0.1663**	−0.1565***	−0.0010*
	(2.48)	(3.57)	(1.79)
ρ_S	−0.0175	−0.1540*	0.0036
	(0.29)	(1.74)	(1.46)
θ: decile 1 & 2	−0.0354	−0.0434*	−0.0378
	(1.48)	(1.78)	(1.39)
θ: decile 7–9	−0.0506**	0.0007	0.0126
	(2.17)	(0.03)	(0.44)
θ: decile 10	0.0460	0.0546	−0.0465
	(1.09)	(1.31)	(1.45)
Intercept	−0.0141	0.1951*	0.0522
	(0.13)	(1.93)	(0.45)
Other controls	Yes	Yes	Yes
District FE	Yes	Yes	Yes
R^2	0.11	0.09	0.12
N	12,715	12,715	6278

Note: This table shows the untouchability estimates using population share, land share and normalized land share per capita as alternative measures of community power. Other controls are as per Equation (1) of Table 3A. Standard errors are clustered at the district level. T-statistics are in the parentheses: significance level: * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

Table 7
Alternative measures of community power – Household estimates of untouchability with district FE, using quadratic θ.

	Population share	Land share	Land share per capita
ρ_H	0.3229***	0.0168	−0.1381***
	(9.24)	(0.30)	(5.20)
ρ_M	−0.1575**	−0.1565***	−0.0006
	(2.64)	(3.54)	(0.97)
ρ_S	0.0216	−0.1461	−0.0070
	(0.39)	(1.66)	(0.51)
θ	−0.1263	0.0202	0.0019
	(1.32)	(0.19)	(0.65)
θ^2	0.1541	0.0305	−0.0000
	(1.24)	(0.29)	(1.16)
Intercept	−0.0120	0.1746*	0.1933*
	(0.15)	(1.72)	(1.83)
Other controls	Yes	Yes	Yes
District FE	Yes	Yes	Yes
R^2	0.10	0.09	0.13
N	13,678	12,715	5755

Note: This table shows the untouchability estimates using population share, land share and normalized land share per capita as alternative measures of community power. Other controls are as per Equation (1) of Table 3A. Standard errors are clustered at the district level. T-statistics are in the parentheses: significance level: * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

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