The Economics of Caste Norms: Purity, Status, and Women's Work in India*

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Abstract

Caste norms, the religious and social rules that underpin the Hindu caste system, impose strong constraints on behavior: women should stay secluded within the home, caste groups should stay segregated, and certain foods should not be eaten. This paper shows that caste norms are weakened when Hindus live alongside Adivasis, an indigenous minority outside of the caste system. Using a number of estimation strategies, including a historical natural experiment that led to local variation in Adivasi population share, we show that having more Adivasi neighbors decreases Hindus' adherence to a wide range of caste rules. Hindu women in Adivasi-majority villages are 50% more likely to work and have substantially higher earnings. Individuals higher on the caste hierarchy are less likely to practice "untouchability" towards those lower than them and villages are more likely to be integrated. We argue that Hindus adhere to caste norms as an investment in status within the caste system, and that this investment is less valuable when Adivasis—a lower-status out-group—form a larger share of the village population. Consistent with this explanation, caste norms are weaker in areas where British colonial policy led Adivasis to hold more land and political power, increasing the returns to social and economic interactions with Adivasis independent of their population share.

1 Introduction

An estimated 100 million Indian Hindu women are disallowed from working.[1] Constraints on Hindu women's labor force participation are tied to the practice of female seclusion required by caste purity norms, the set of religious and social laws that governs behavior within the Hindu caste system (Chen, 1995; Field et al., 2010; Luke and Munshi, 2011; Jayachandran, 2015). Caste norms are guided by the idea that certain people, activities, and foods are "impure" and that (higher caste-rank) individuals should seek to preserve own purity by avoiding contact with these polluting aspects of society.[2] Because of this, women are instructed to stay secluded within the home, which severely limits their ability to work and participate in the community. Caste purity norms also restrict inter-group interactions and promote discriminatory practices towards low caste-rank individuals, imposing substantial equity and efficiency costs on social and economic behavior in Indian villages.[3]

This paper asks whether caste norms are weakened when Hindus live alongside an ethnic group that is outside of the caste system. Specifically, we study the integration of Hindus with Adivasis, an indigenous minority that makes up just under a fifth of the rural population of central India. Since Adivasis are traditionally non-Hindu, they are not subject to caste purity rules.[4,5] On average, Adivasi women are 1.5 times as likely to work as Hindu women and they score higher along a range of empowerment indicators.[6] Similarly, Adivasi men and women do not adhere to caste purity restrictions regarding the "untouchability" of low caste-rank individuals or to caste food taboos.

There is limited causal evidence on the effect of integration with an out-group on own group cultural practices (Giuliano, 2021; Bisin and Verdier, 2022). Theoretically, the impact is ambiguous: on the one hand, assimilation and desire for conformity may lead to convergence in culture while, on the other hand, desire to maintain separation may lead individuals to increase investment in their own group's cultural practices (Bisin and Verdier, 2010). The latter may be an important consideration in our setting: though they are outside of the caste system, Adivasis are often considered to be less pure—and therefore lower social status—than most Hindus. At the same time, adherence to caste purity norms is costly; anthropologists argue that Hindus are willing to incur

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[1]Estimate is based on responses to the 2011 India Human Development Survey, a nationally representative survey. Adult women are asked, "If you found a suitable job, would you be allowed to work?"

[2]All Hindus are divided into castes, which are hereditary, exogamous ethnic groups. There are approximately 3,000 distinct castes across India and, together, these ethnic groups account for 80% of India's population (Munshi, 2019).

[3]Previous empirical studies have documented wide-ranging impacts of caste purity norms, including on the efficiency of local governance (Munshi and Rosenzweig, 2015); inter-caste trade (Anderson, 2011); occupational decisions and discrimination in the labor market (Attewell and Madheswaran, 2007; Oh, 2021; Cassan et al., 2022); health and education outcomes (Munshi and Rosenzweig, 2006; Jayachandran and Pande, 2017; Spears and Thorat, 2019); and consumption behavior (Atkin et al., 2021).

[4]Today, a majority of Adivasis report that they practice Hinduism in addition to or instead of their traditional religious practices (IHDS 2011). However, for clarity of exposition, we will use the term "Hindu" throughout the paper to refer to ethnic groups who have traditionally been part of the Hindu caste system.

[5]Adivasis' self-identification highlights that a key feature of their society is the "absence of division of labour and caste system" and also the "relative freedom of women" (UNWGIP 1994).

[6]For instance, Adivasi women have more intra-household bargaining power and are more likely to participate in local governance (IHDS 2011).

these costs primarily as a means of gaining or maintaining status within the caste system (Srinivas, 1966). If increased Adivasi population share is associated with reduced value to caste status, then we should expect Adivasi presence to be associated with a reduction in adherence to caste norms.

To shed light on this question, we turn to central India where 64% of the total Adivasi population in India is based. This area corresponds to the former Gondwana Kingdom, a region settled and ruled by the Gonds, an Adivasi tribe. Hindus' in-migration to central India occurred primarily during the 18th to 20th centuries and village composition has changed little since that time.[7] Using multiple empirical strategies, including cross-sectional analysis for the entire region and a historical natural experiment in the state of Odisha, we provide causal evidence that caste norms are weaker when Hindus in central India live in villages with a higher share of Adivasi neighbors.

Caste purity norms practiced today prescribe appropriate behaviors with respect to (a) women's seclusion; (b) marriage rites; (d) inter-caste interactions; and (d) food taboos (Chakravarti, 2018; Piketty, 2021).[8] Across all settings, we find that Hindu women in Adivasi-majority villages are less likely to practice *purdah* (female veiling) and report more mobility. Consistent with this, they are substantially more likely to work and have higher yearly earnings. Similarly, reduced adherence to female seclusion norms improves Hindu women's participation in local governance. We also find that Hindus in Adivasi-majority villages are less likely to report that their caste community adheres to purity rules on food taboos and on marriage, including the practice of dowry and the prohibition of widow remarriage. When less constrained by rules imposed by the caste system, Hindus have different social and economic relationships with one another. We find, for instance, that villages are more likely to be integrated and that Hindus are less likely to practice untouchability towards *Dalits* (a group of castes formerly referred to as "untouchables"). This is a striking finding since the practice of untouchability against Dalits is considered to be the one of the most harmful and most deeply rooted caste purity norms (Dirks, 2011).

The key econometric challenge to our analysis is that Hindus and Adivasis settled non-randomly, raising the concern that selection or unobservable features of Adivasi villages influence our results. Almost all households in both settings report that their families have been located in their current village for over 90 years, reducing the concern that contemporaneous migration drives the observed patterns. That said, we show that results are robust to the inclusion of caste fixed effects, which helps to address the concern that certain castes (e.g. less purity-norm-adherent castes) were more likely to migrate in to villages with Adivasis. In an extension to our analysis, we leverage a prediction from our conceptual framework that Adivasi-share impacts should be heterogeneous by caste rank. For this analysis, we include village fixed effects and show that results remain robust, which helps to address the concern that unobservable village-level confounders drive our estimates.

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[7]Central India includes the following states: Andhra Pradesh, Chhattisgarh, Gurajat, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, and Telengana. Almost every Hindu and Adivasi household in our sample reports that their family has been located in their current village for over 90 years.

[8]Traditionally, caste purity rules also provide guidelines on appropriate occupations for members of different castes. However, these guidelines are less relevant today, especially in rural areas, where a majority of the population works in agriculture (Cassan et al., 2022).

Despite the robustness of our cross-sectional findings, there remains the concern that omitted characteristics of Adivasi villages influence our analysis. We therefore exploit a historical natural experiment that led to quasi-random variation in Adivasi population share across villages in western Odisha (one of the states in our central India sample). In 1894, railroad expansion to the district of Sambalpur in Odisha expanded opportunities for trade and led to an influx of Hindu cultivators from neighboring districts into a previously Adivasi-majority area. The new railroad stop was located directly on the eastern bank of the Mahanadi River, a 1 mile wide river whose single crossing point in the region was at the railroad station itself (Figure 1). Extensive historical evidence documents that Hindu migrants came primarily from districts to the west and south-west of the new railway station and were constrained by the river to settle on its western banks. Using the Mahanadi River boundary within a regression discontinuity design, we find that villages directly to the east of the river (where fewer Hindus settled) have roughly 20 percentage points higher Adivasi share today.

The validity of our identification strategy relies on the assumption that the villages on either side of the river crossing were comparable prior to the introduction of the railroad and also that the railroad did not differentially impact market access and profits for rice farmers on the eastern versus western side of the river. We collect and digitize rich archival data to validate these assumptions: using village records and individual land-ownership data for 1915-1955, we show evidence that villages were settled by the same set of castes and tribes on both side of the river and that village ethnic composition has not meaningfully changed in the past century. Villages on either side of the river are not distinguishable in terms of land value, tax incidence, and the price of rice paid to farmers in the decades following the railroad construction. Our regression discontinuity results are also highly robust to the selection of bandwidth and RD functional form.

Having established that Adivasis' presence shapes the practice of caste norms among their Hindu neighbors, we turn to mechanisms. Our conceptual approach is motivated by an extensive ethnographic and historical literature on caste norms, which argues that adoption of purity norms is seen as a means of upward social mobility for caste groups, especially those that are in the middle of the caste hierarchy (versus those at the bottom, who have a harder time escaping their low inherited social status).[9] Qualitative researchers emphasize that widespread take-up of purity practices occurred relatively recently, when British colonial interventions and other features of the socio-economic environment made it more valuable to assimilate with Brahmins, the highest-ranking caste and one with a long history of practicing purity norms (Bayly, 2001; Dirks, 2011; Piketty, 2021).

With these historical observations in mind, we hypothesize that increased Adivasi share weakens caste norms because it is associated with reduced value to assimilating with Brahmins and, conversely, increased value to maintaining social and economic ties with Adivasis. Since caste norms directly limit interactions with Adivasis and promote discriminatory behavior towards them, main-

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[9]For discussion of *Sanskritization* (also termed *Brahmanisation*), the social process by which castes adopt purity norms as a means of increasing their social status, see for instance Srinivas (1952); Ghurye (1969); Bayly (2001); Chakravarti (2018).

taining ties is easier when adherence is lower. To provide evidence for this hypothesis, we turn first to historical data on castes' cultural practices. For each of the main castes in our RD sample, we collect and digitize data on their practice of purity norms at the beginning of the 20th century and compare it to estimates from our primary survey data collection today (Figure 3). We find that, while Brahmins have consistently adhered to purity norms regarding female seclusion, widow remarriage, and meat taboos, for other castes in our sample take-up of these norms was non-existent then but prevalent now. Similarly, Hindus' relationship with Adivasis has also changed: data from 1906 shows that, at that time, even high-caste Hindus our sample districts did not consider Adivasis to be "impure." Now, over half our sample practice untouchability towards them.[10] Strikingly, though, in higher Adivasi share villages (east of river), the proportion of respondents who practice Adivasi untouchability drops by 50 percent. Thus, we find that discrimination against Adivasis decreases when they are dominant in the village. In line with this, we find that Hindus have much stronger social and financial ties with Adivasis when they are larger in group size. Moreover, we show that the village social hierarchy is malleable and adjusts to ethnic composition: we conduct a survey with elders in our RD sample villages, asking them to rank each caste and tribe in their village in terms of social status. In high Adivasi share villages, Adivasis are twice as likely to be ranked as either equal to or higher than a middle-rank caste group. These findings also help to make sense of a surprising feature of our results: we observe that cultural practices converge to those exercised by a socially marginalized group. Within the context of our conceptual framework, though, Adivasis' low social status can be understood at least in part as an *outcome*, rather than a fixed feature of the social context.

An alternative explanation for our findings is that when Hindus are exposed to a larger population of Adivasis they are more likely to learn about the costs and benefits of adhering to purity norms (Jarotschkin and Zhuravskaya, 2019; Schmitz et al., 2021; Boelmann et al., 2022). Or, another possibility is that Hindus emulate Adivasi cultural practices because they wish to assimilate to the most commonly observed behavior among their peers (Bisin and Verdier, 2010; Bisin et al., 2016). Both of these mechanisms may contribute to the patterns we observe though we argue that they are unlikely to be a primary driver of our results. Without additional assumptions, these mechanisms would generally imply convergence in behavior *among* Hindus and the latter mechanism would also imply that Adivasis should emulate Hindu caste norms when they are in the minority. Yet we find no impact of Hindu population share on Adivasi behavior and considerable heterogeneity in Adivasi-share impacts on Hindus by their caste rank. On average, Brahmins and other high-rank castes have strongest adherence to purity norms and adherence declines with declining caste rank. In line with our conceptual framework, increased Adivasi group size has the largest

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[10]The practice of untouchability has important implications for Adivasis' ability to access public resources and participate in community events in the village. Following the anthropological literature, we measure untouchability by asking respondents whether they would touch water or food that has been touched by an Adivasi (Xaxa, 2008; Skoda et al., 2013). The rate of homocides against Adivasis and low-rank castes has also been linked to adherence to purity norms against sharing water with members of these ethnicities (Bros and Couttenier, 2015).

impact for middle-rank castes: intuitively, these individuals are high enough in the caste hierarchy to have found it worthwhile to invest in purity norms in the first place, but close enough in rank to Adivasis to be impacted by their presence. When Adivasis are in the majority, middle-rank Hindus have strong social network ties with them and their adherence to purity norms diminishes to the extent that, along many dimensions (including women's work), middle-rank Hindus are not distinguishable from Adivasis.

In a final exercise, we provide further evidence for the hypothesis that adherence to purity norms will be lower when returns to interacting with Adivasis is higher. We turn to a distinct setting where British colonial policy increased Adivasis' political and economic power, independent of their group size. In certain districts of the current states of Chhattisgarh and Odisha, the British government assigned the position of "village watchman" to an existing community leader: the village's Adivasi priest (*jhankar*). The historical record shows that it was standard in villages across central India for there to be both an Adivasi priest and a Brahmin priest and that both served Adivasi and Hindu communities. The village watchman position was generally assigned based on merit but, as we discuss in Section 8 and Appendix B, the need to quickly put in place an administrative governing structure upon the death of the previous ruler led the British to assign this position to an existing person of respect in the community. Watchmen received tax-free land and were paid yearly tributes by all other village households. We show that blocks where the watchman position was assigned to Adivasis are not different in terms of Adivasi population share or geographic characteristics; however we caution that our sample of blocks is small and that unobservable characteristics may be confounders. With that caveat, we find that Hindus in blocks where Adivasis were assigned the watchman position are less likely to practice untouchability towards Adivasis today. They are also less likely to report adherence to female seclusion norms and caste food taboos.

This paper contributes to three bodies of work in economics. First, our findings shed light on the process of inter-group cultural transmission. There is a small but growing number of empirical studies that evaluate the impact of individual immigrants on shaping a specific cultural trait of the native majority (Jarotschkin and Zhuravskaya, 2019; Schmitz et al., 2021; Boelmann et al., 2022). Our results, which document cultural convergence across a broad set of a practices, broaden our understanding of the ways which cultural traits are linked and jointly evolve (Bisin and Verdier, 2010). Additionally, our findings expand our understanding of cultural transmission by documenting a case where cultural practices of a higher status group converge to those of a lower status group. While the emulation of practices associated with high-status groups has been documented across several studies (La Ferrara et al., 2012; Bisin et al., 2016; Fouka, 2020), the question of whether cultural practices are shaped from below has received far less attention.

Separately, our results contribute to the growing empirical literature on the role of gender attitudes in constraining women's work (see Jayachandran (2015), Giuliano (2021), and Jayachandran (2021) for reviews). A number of studies document the deep roots of gender attitudes and the strong persistence of these attitudes over time (Fernández and Fogli, 2009; Alesina et al., 2013;

Carranza, 2014; Teso, 2019; Becker, 2021). We add to these findings by documenting how attitudes evolve in the medium-run, as the result of the integration of two groups with different religious and ethnic backgrounds. As such, our findings also relate to a set of papers that document the process of cultural change and the malleability of norms and beliefs (Fernández et al., 2004; Fernández, 2013; Bursztyn et al., 2020; Field et al., 2021; Dhar et al., 2022).

Finally, we add to our understanding of the economic and social implications of caste. Previous work has documented the influence of caste norms on occupational preferences Oh (2021); Cassan et al. (2022); health and education outcomes (Munshi and Rosenzweig, 2006; Jayachandran and Pande, 2017; Spears and Thorat, 2019); and on the efficiency of inter-caste trade (Anderson, 2011) and local governance Banerjee and Pande (2007). Several papers have studied the economic implications of caste networks (see Munshi (2019) for a review), though much of this work has focused on within-caste ties; we add to these findings by demonstrating the importance of inter-caste networks and relationships. In demonstrating that Hindus' adherence to purity norms responds to Adivasi presence, our findings connect to recent studies that document the endogeneity of caste identity to social and economic incentives Cassan and Vandewalle (2017); Atkin et al. (2021).

The rest of this paper proceeds as follows: Section 2 discusses the historical background and conceptual framework; Section 3 gives an overview of our data; Section 4 presents descriptive statistics on the take-up of purity norms across caste and Adivasi groups; Section 5 presents our OLS estimates of the impact of Adivasi population share on Hindus' adherence to purity norms; Section 6 extends our analysis of this same question to our spatial regression discontinuity setting; Section 7 discusses mechanisms; and Section 8 concludes.

2   Historical Background

Our study setting is Central India, a region once ruled by the Gonds, an Adivasi tribe.[11] This wooded and hilly region was populated primarily by Gonds and other Adivasi tribes for most of the fourteenth through eighteenth centuries, isolated from the "Hindu empires of the plains" to the north and south (Deloche, 1993). Yet by the beginning of the 20th century several waves of Hindu migrants had arrived and villages in Central India had become, and continue to be, mixed Adivasi-Hindu societies. Hindus' in-migration was due in part to the construction of the railroad: between 1853 and 1930, the British government in India built an extensive railroad network, connecting inland districts in Central India to one another and to the rest of the sub-continent (Donaldson, 2018). The railroad greatly improved communication and brought new opportunities for trade to Central India, drawing in Hindu cultivators from surrounding regions (Marten, 1912). One of our estimation strategies exploits village-level variation in Hindu in-migration to Central India after the 1894 construction of a railroad stop in the state of Odisha. We further describe the historical context as it relates to the railroad construction and our identification strategy in Section 6. In

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[11]The Gond Kingdom, called Gondwana, was conquered by the Marathas in the 18th century and most of the region was taken over by the British by the middle of the 19th century.

this section, we offer historical context on the integration of Adivasi and Hindu societies and on the Hindu caste system. We then bring these historical insights together to motivate a conceptual framework for understanding how the presence of Adivasis would impact Hindus' adoption of caste purity norms.

2.1 Social Hierarchy and Cultural Practices in Adivasi-Hindu Villages

Central India is now home to at least 600 Hindu and Adivasi groups and, on average, there are 12 distinct ethnicities (tribes and castes) represented in a village.[12] Historians and anthropologists emphasize two key determinants of social capital and social relations within Indian villages: (1) caste hierarchy and (2) groups' relative size, political power, and economic resources. Below we discuss each of these as well as their relation to caste purity norms.

Social Hierarchy within the Caste System   The caste system is a system of social stratification. Each Hindu person is associated with a caste (also termed *jati*), which is a hereditary, endogamous ethnic group. Traditionally, each caste was also associated with a specific occupation. Going back at least as far as 1500–500 BCE, there is evidence of a broad ranking of these castes based on concepts of purity and pollution. The justification of this ranking, as well the implications of it for activities of daily life, are summarized in the Manusmriti, a 200 BCE text. The Manusmriti is a set of social laws written by Brahmin scholars—Brahmins are the priest caste and everywhere in the Central India the highest ranking group—that was later codified as religious law for all Hindus by the British colonial government (Agnes 1999).

Manu describes a society divided into four classes, or *varnas*. Brahmins sit at the top while Dalits (a term that refers to a group of castes) are considered to be so impure that they are excluded from this structure entirely. There are, however, over 3,000 castes across India and 70% of individuals in Central India belong to castes that sit between the Brahmins and the Dalits in the social hierarchy.[13] The British colonial government, in their 1901 Census of India, later expanded upon the four-fold *varna* classification and introduced a written ranking of every caste by region. Historians (and later census officers) now recognize that the 1901 ranking did not accurately reflect the multitude of localized rankings across villages and regions at the time (Ghurye, 1969; Bayly, 2001; Dirks, 2011).[14] Regardless, and potentially due to the very fact that the census ranking was created,[15] we find that the 1901 census rankings closely match the current caste hierarchy: in our

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[12]The Government of India collects but does not release information on the distribution of *jatis* across regions. Our estimate is based on responses to the 1992-1993 National Family and Health Survey (NFHS), which collected *jati* information for each household and is representative at the district level. Estimate of number of castes in each village is from the 2011-2011 IHDS survey.

[13]The *Kshatriyas*, or so-called "warrior" castes, are ranked second in the Manusmriti and similarly tend to be ranked immediately after the Brahmins in local caste hierarchies.

[14]For instance, J. H. Hutton, the 1931 census commissioner of India, wrote that "All subsequent census officers in India must have cursed the day when it occurred to Sir Herbert Risley [the 1901 census commissioner], no doubt in order to test his admirable theory of the relative nasal index, to attempt to draw up a list of castes according to their rank in society. He failed, but the results of his attempt are almost as troublesome as if he had succeeded" (Hutton 1931).

[15]See Dirks (2011) for a detailed discussion of the social, political, and economic impacts of the creation the caste

RDD sample of 160 villages, we ask elders from different castes to rank all groups in their village and find that the rankings are almost identical to those from the 1901 census.

Sanskritization and the Adoption of Purity Norms   The above discussion of caste rank highlights the fact that, to a large extent, an individual's perceived purity is fixed at birth. That being said, there is also some scope for upwards or downwards social mobility within the caste system; this mobility is a function of an individual's (and their fellow caste members') adherence to caste purity norms. Manu, over more than 2,000 verses, gives clear prescriptions for behavior required to maintain purity. These prescriptions can be categorized into the following areas: (a) women's role in society and the home, (b) marriage rites, (c) food taboos, (d) inter-caste inter-actions, and (e) occupational guidelines Chakravarti (2018). A majority of the prescriptions are directed specifically towards Brahmins; Manu makes a distinction between how Brahmins should behave and how lower-caste individuals should behave. For instance, while widow remarriage is forbidden for Brahmins in the Manusmriti (a woman is seen as impure upon the death of her husband), it is encouraged for lower castes. Similarly, castes aside from the Brahmins historically did not practice taboos against meat or alcohol.

The fact that Brahmins, the highest ranking caste, have traditionally held different cultural practices and norms than other castes gives individuals lower on the hierarchy a clear path for seeking higher caste status: emulating Brahmin purity norms. This practice, which is termed *Sanskritization* or *Brahmanisation*, is described by the anthropologist M.N. Srinivas (1952) in the following way: "A lower caste [is] able to rise to a higher position in the hierarchy by adopting vegetarianism and teetotalism [etc.]... in short, it [takes] over as far as possible, the customs, rites and beliefs of the Brahmins."

High caste status has historically offered clear economic advantages. The British colonial government assigned government jobs, decided court cases, and allocated resources in ways that preferenced higher ranked castes (Bayly 2001; Dirks 2011; Piketty 2020). Notwithstanding the current affirmative action policies for lower ranked castes, caste-based discrimination continues to offer material benefits to higher ranked castes today (Munshi, 2019). Ethnographic evidence also points to the fact that individuals enjoy the feeling of respect or superiority that comes from being high status (Srinivas, 1966). Likely related to these two points, Brahmins and other higher ranked castes did not historically respond well to the adoption of purity norms on the part of castes ranked below them; for instance, Chakravarti (2018) describes a series of riots in the Tamil Nadu region in 1980 when lower rank caste women attempted to dress in a way that was reserved (prescribed by the Manusmriti) for higher rank women.

Bringing the these features of the caste hierarchy together, D.F. Pocock (1957) summarizes the caste system as a system of "inclusion and exclusion... [in which] each caste tries to include itself with the higher castes and, at the same time, dissociate itself from the lower castes. This process being widespread, the castes above refuse to accept the inclusion just as the castes below try to

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ranking in the 1901 census.

elbow their way in."

Adivasis and the Locally Dominant Caste   Where do Adivasis fit in to the above system of social stratification? Adivasis are heterogeneous in terms of their lineage systems, kinship structures, marriage customs, and other social institutions; in many ways, the key characteristic that unites Adivasi tribes is the *absence* of caste. Consistent with a broad ethnographic literature, our own qualitative data collection shows that Adivasis often consider themselves to be outside the caste system and therefore not subject to purity norms.[16],[17] At the same time, as part of society within Indian villages, Adivasis are generally assigned a purity rank. This contradiction is exemplified by Adivasis' duplicate entry in the 1901 census: the British placed Adivasis within the caste hierarchy—below almost all castes but above Dalits—but simultaneously they also listed Adivasis elsewhere as an "unranked" group outside the caste system (alongside Muslims and other religious minorities).

Qualitative scholars also emphasize that for Adivasis and for other lower-status groups, status within a village greatly depends on their dominance — where dominance is measured in terms of land ownership or population share (Srinivas 1966; Dumont 1970). For example, Skoda et al. (2013) in an ethnography of the relationship between Adivasis and Hindus in villages in northern Sambalpur, writes that higher status Hindus "concede" to accept water from groups ranked below them when that group holds a majority of the land. Similarly, the 1911 census commissioner for Central India observed that "Many Brahmans are willing to serve an aboriginal *of good standing and wealth...* The fact that the tribes are not looked upon by Hindus as impure aids the process" (emphasis our own) (Marten, 1912).

Due to the fact that Adivasis were the first settlers of Central India, Adivasis historically held both considerable land and, in some areas, local political power. We digitize British land records and find that, in 1891, Adivasis served as village headmen in almost a third of villages in central India. We also find that Adivasi population share continues to be strongly correlated with land ownership share today. It is also predictive of local political power, as measured by the share of local elected officials in unreserved positions who are Adivasi.

2.2   Conceptual Framework

Taken together, the historical and ethnographic evidence point to a tension in the caste system between, on the one hand, establishing superior purity over other groups and, on the other, aiming to maintain ties with those who have political or economic power (who may or may not be high in purity rank). This section formalizes these insights in a simple conceptual framework of culture choice. Our approach is modeled on Akerlof and Kranton (2000)'s and Shayo (2020)'s endogenous social identity framework, where social groups are defined based on their differences and where the

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[16]See Xaxa (2008) for a review of ethnographic studies on Adivasi identity and, in particular, on Adivasi attitudes towards gender.

[17]This point is also highlighted in Adivasis' self-identification submitted to a UN Commission on Indigenous Peoples (1994), which includes the following descriptors: "Relative freedom of women within the society; Absence of division of labour and caste system, [and] Lack of food taboos."

key means by which individuals gain access to a group is through conforming to that group's norms and behavior. Our framework delivers comparative statics which we use to distinguish between our approach and competing explanations for inter-group cultural transmission.

Consider a village with multiple ethnic groups (e.g. tribes and castes), indexed by $j = 1, ..., J$. Ethnic groups in a village can be ranked along a social hierarchy, where the ordering is fixed, exogenously given, and known by all. In our setting, each ethnic group j's norms and behavior are summarized by group members' average level of adherence to an index of purity norms, which we denote by $\overline{x}_j$ and where $x \in [0, 1]$. Higher $\overline{x}_j$ corresponds to higher average adherence to the purity prescriptions described in Section 2.1 including, for instance, the seclusion of women inside the home. Membership in an ethnic group comes with material payoffs, π_j. These material payoffs are the result of social and economic interactions with group members and are increasing in a group's size, political power, or economic resources. Because of historical and current caste-based discrimination, higher rank groups have, on average, greater political power and economic resources. Reflecting the fact that adherence to purity norms is costly (for instance, households who adhere to the female seclusion norm lose out on women's potential income from working outside the home), material payoffs are decreasing in $\overline{x}_j$. Individuals may also derive intrinsic utility from having a high social hierarchy rank, which is denoted by r_j (Tajfel and Turner 1979).

Each individual is endowed with a fixed ethnicity, exogenously given at birth. Our starting assumption is that ethnic groups can be ordered in terms of their social distance from Brahmins, the priest caste and highest status Hindu ethnic group. However, there is some scope for social mobility: individuals can seek to assimilate with a group above or below them on the social hierarchy. Assimilation allows individuals to access some of the material or status payoffs associated with a different ethnic group. The degree to which an individual from ethnic group i gains from assimilation with ethnic group j will depend on the social distance between i and j (Akerlof, 1997; Shayo, 2020). Social distance d_{ij} is increasing in the distance between own adherence to purity norms and group j's prescribed behavior, $x_{ij} = |x_i - \overline{x}_j|$.[18] This reflects the basic idea that individuals gain access to a social group by conforming to that group's norms and behavior. d_{ij} is also increasing in $r_{ij} = |r_i - r_j|$, the rank difference between i and j. This reflects the inherited, or exogenously given, component of social distance. The idea that individuals can assimilate with other social groups by emulating their behavior—but also that assimilation ability is constrained by fixed characteristics of the individual—is consistent with models of assimilation proposed in other settings, such as in the United States where skin color imposes important constraints Fouka et al. (2021).

Bringing these features of culture choice and ethnic identity together, we can represent the utility of an individual from an ethnic group i who chooses to assimilate with the ethnic group j

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[18]For simplicity of exposition, we assume here that all members of group i have the same level of adherence to purity norms though this assumption is not required.

in the following way:

$$U_{ij}(x) = U(\pi_j(x), r_j, d_{ij}(x, \overline{x}_j, r_{ij})),$$

where U is increasing in π_j and r_j and decreasing in d_{ij}. Normalize $U(0) = 0$.

Let $x_i{}^*$ denote the optimal level of purity norm adoption for an individual from ethnic group i, given their rank r_i as well as the payoffs and purity norms associated with other ethnic groups in the village. As described in Section 2.1, the practice of purity norms is traditionally associated with Brahmins, the priest caste and also the highest ranking caste (i.e. $r_B = 1$). In any given village v, Brahmins' traditional level of adherence to purity norms can be denoted by $\overline{x}_{B,v} \in [0, 1]$ and it is known by all. It then follows that adoption of purity norms by individuals from other ethnic groups in that village can be described in the following way:

$$x^*_{i+1,v} \leq x^*_{i,v} \leq \overline{x}_{B,v},$$

where $x^*_{i+1,v}$ denotes the optimal choice of adherence to purity norms by someone in the ethnic group that is one rank below i in village v (where "below" means lower status rank). This follows from the assumption that benefits to assimilation are decreasing in rank distance from a given group. In Section 4, we provide evidence in support of this statement.

The framework generates two comparative statistics relevant to our empirical context:

1. *Average level of adherence to purity norms decreases as π_A, the material payoffs associated with an Adivasi ethnic identity, increases.* Adivasis have a lower rank than most Hindu caste groups; an increase in π_A will lead Hindus ranked above them to assimilate towards Adivasis which, following the basic result above, will lead them to lower their adherence to purity norms. We can consider multiple channels through which π_A might increase:

   - An increase in Adivasi share of the population. This could lead to higher material payoffs from assimilating with Adivasis because, for instance, it increases the value of informal insurance from Adivasi network ties. As discussed in Section 4, Adivasi population is also strongly correlated with Adivasi land ownership share and Adivasi political power. Population share is the primary measure of π_A employed in our empirical analysis.

   - A direct increase in Adivasi polical power or economic resources, independent of population share. In Section 7, we extend our analysis by testing this channel.

   - An increase in the opportunity cost of purity norms adherence due to market- or price-based effects. By this we mean, for instance, that the presence of Adivasis could be associated with a decrease in the cost of meat or an increase in the going wage for women's work. In Section 6, we discuss negative evidence for this channel.

2. *The impact of an increase in π_A on Hindus' adherence to purity norms will have an inverted*

U-shape with respect to rank. Hindus of low rank already have low take-up of purity norms so the magnitude of decrease in adherence for this group will be smaller than it would be for those higher up the social hierarchy. At the same time, caste groups with higher ranks have greater rank distance from Adivasis and so have less incentive to change their behavior in response to an increase in π_A.

Alternative Mechanisms   Our framework assumes that Hindus adopt purity norms as a means of upward social mobility. It is useful to understand how predictions regarding the presence of Adivasis would differ under alternate assumptions of what drives Hindus' choice of cultural practices. One view proposed by both anthropologists and within the economics literature is that adoption of purity norms reflects deeply held religious or moral beliefs (Dumont, 1970; Jayachandran, 2021). Under this assumption, we would not necessarily expect the presence of Adivasis to shape purity norm practice. A second view, and one that would be consistent with canonical models of norms transmission (Bisin and Verdier, 2010, 2022), is that Hindus and Adivasis select their cultural practices by imitating the most commonly observed behavior amongst their peers. This could explain average convergence to Adivasi cultural practices in Adivasi majority villages, though it would not explain why Adivasis don't pick up Hindu norms when they are in the minority.[19] Additionally, without imposing further assumptions, it would not predict either the baseline heterogeneity in take-up of purity norms by rank or the heterogeneity in Adivasi share impact by rank.

Finally, we note a distinction between our approach and others in the literature where individuals choose their cultural identity out of a desire to establish difference but where, unlike in our setting, an increase in the population share of a lower-status group is assumed to lead to backlash; or, in other words, to the increased take-up of own-group cultural practices (Bisin et al., 2016). These approaches do not generally take into account the economic costs of maintaining social distance from other groups (Advani and Reich, 2015). In the final section of this paper, we further test this important assumption of our model by turning to a setting where Adivasi share stays constant but where the economic returns to interacting with Adivasis increases.

3   Data and Measurement

Our analysis brings together data from several sources:

Socio-Economic and Caste Census   Our primary result, which is that Hindu caste women are substantially more likely to work for pay when they live in villages with Adivasi women, comes from individual-level data from the Government of India's 2011 Socio-Economic and Caste Census (SECC). Our dataset includes all individuals residing in the states of Madhya Pradesh and Odisha, which together include a population of 133 million people. The SECC survey asks individuals

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[19]Bisin and Verdier (2010)'s canonical model of horizontal norms transmission assumes that we select behavior based on imitating peers or role models, rather than persons against whom we express animosity. Given the baseline level of discrimination against Adivasis, a prediction of convergence towards Adivasi norms would first require that Adivasis' presence leads to reduced prejudice against their group (Bisin et al., 2016). "Contact hypothesis" models could deliver this prediction (Allport, 1954).

to list their primary occupation, which is recorded as a free-text field. We clean this field and classify women as working if they list their primary occupation as one which involves work outside the home and which is typically paid. In our main analysis, we classify women who report that their primary occupation is "cultivation on own field" as not working, since the social norm which restricts women's female labor force participation centers on work outside of the home. We restrict our analysis to adult women between the ages of 15 and 65 who live in rural areas.

Indian Household Development Survey (IHDS) We use the 2011 round of the IHDS to complement the SECC data and generate our main reduced form evidence on Hindu caste households' take-up of a broad set of purity norms. The IHDS survey includes rich data on households' cultural practices, occupational outcomes, and other demographic information. We classify cultural practices as purity norms by directly matching the IHDS survey questions to the code of behavior contained in the Manusmriti. As discussed in Section 2.1, caste purity norms are summarized in the Manusmriti, a 200 BCE text of religious codes. The Manusmriti contains over 2,000 rules on personal behavior, which are classified according to the following categories: (a) women's seclusion; (b) marriage rites; (d) inter-caste interactions; (d) food taboos; and, (e) permitted occupations. We review all survey questions in the IHDS and match these to codes from each of categories (a)-(d). For instance, the Manusmriti directly prohibits widow remarriage among Brahmins: *By twice-born men [Brahmins] a widow must not be appointed to (cohabit with) any other (than her husband); for they who appoint (her) to another (man), will violate the eternal law* (Chapter IX, Verse 64). We match this rule to the IHDS household survey question, "In your community (jati), for a family like yours, is it permissible for a widow to remarry?" We exclude norms pertaining to traditional occupations (category e) from our analysis since these rules are less applicable in the present day, especially in rural areas where the majority of households practice agriculture. We also aggregate variables into purity norms categories (female decision-making, female mobility, food taboos, marriage rules, and inter-caste interactions) constructed using standardized indexes per Kling, Liebman, and Katz (2007).

Our conceptual framework predicts that the impact of Adivasi share will differ based on jatis' initial distance from Brahmins (where distance is proxied by jatis' status ranking in the 1901 Census). The IHDS survey includes a free-text jati field for all caste and Adivasi respondents. We clean and harmonize jati names,[20] and then hand-match these names to the Caste Rankings from the 1901 Census of India. Using this match, we categorize caste jatis according to whether they were located above or below Adivasi tribes in the rankings.[21]

As discussed in Section 2, we focus our analysis on Central India (12,046 survey sample house-

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[20]Many castes go by several names and, additionally, some responses to the jati question included a household's clan (rather than jati) name. We harmonize the list of jatis by referencing the Anthropological Survey of India's "List of Main Communities" (Singh, 1996), which includes synonyms and clan names for 2,205 jatis across India. We thank Dan Keniston for pointing us to this invaluable resource.

[21]Caste rankings were completed separately for each region; we match districts in our sample to their corresponding 1901 British Province (where there is an imperfect match, we classify districts according to the province which overlaps with the largest portion of district land).

holds), which corresponds to region occupied by the former Gondwana Kingdom. Central India includes the following states: Andhra Pradesh; Chhattisgarh; Gujarat; Jharkhand; Madhya Pradesh; Maharashtra; Odisha; Rajasthan; and, Telengana.[22] We additionally show results in the Appendix for the nationwide sample (27,579 households).

Spatial Regression Discontinuity Sample Household Survey   We conduct a survey of 874 Hindu men across 143 villages that are located within 20 kilometers distance to either side of the the Mahanadi River (our RDD sample). We interview men about their wife's labor force participation; their personal beliefs about women's work and their perception of community beliefs about women's work; as well as their practice of additional caste purity norms, including food taboos and the untouchability of Adivasis. To shed light on mechanisms, we include a social network module. Motivated by our conceptual framework, we restrict our survey sample to men from "middle-rank" castes: those that rank above Dalits, or "untouchables" and below Brahmins in the caste hierarchy.

Separately, we also interview at least two male elders in each sample village. In that survey, we elicit from elders the purity rank of every ethnic group (caste or tribe) in their village.

Historical Land and Village Records   In order to validate key identifying assumptions for our spatial regression discontinuity design, we collect and digitize individual land records and village records for Sambalpur district for the period 1915-1955. These land and village records contain detailed information on (1) village inhabitants, including name and ethnic group of every household head; (2) village governance structure, including ethnic group of village headman; (3) features of the agricultural labor and trade markets, including wages and price received by cultivators for their rice. The 1915 records were the first written records of land ownership created by the British colonial government for this district.

4   Social Hierarchy and the Take-up of Caste Purity Norms

Before turning to our main empirical analysis, it is instructive to look at the raw data on average adherence to purity norms among Hindus and Adivasis. Our conceptual framework states that take-up of purity norms among Hindus will be decreasing in caste rank distance to Brahmins, the highest ranking caste. This is because we assume that low-rank caste groups are less likely to be able to successfully assimilate with Brahmins, even given the same investment in purity norms, as groups ranked above them. Thus it is not worthwhile for these lower-rank individuals to invest in costly purity norm behavior. Survey data from the IHDS supports this framework assumption.

In Table 1, we show average adherence to purity norms among Adivasis and, separately, among high-, middle-, and low-rank castes. Low-rank refers to Dalits, the group of castes formerly referred to as "untouchables." High-rank refers to Brahmins and Rajputs, who are at the top of the caste

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[22]We focus on Central India because (a) it is home to 64% of the total Adivasi population in the country; (b) many of the primary castes and Adivasi tribes in Central India are located throughout the region (and are not located in other parts of the country); and (c) there is strong overlap between our study area and the region which formed the British Central Provinces, thus local governance and other colonial institutions were fairly homogenous across our sample.

hierarchy in Central India.[23] Middle-rank are all castes in between these two groups; they consist of 75% of the Hindu population in Central India.[24] As explained in Section 3, norms questions from the IHDS are matched to specific verses from the Manusmriti and are classified into four broad norms categories that appear in the text: (1) women's role in society; (2) marriage rules; (3) food taboos; and (4) inter-caste interactions. For category (1), the Manusmriti instructs women to stay secluded within the home and states that women should always remain dependent on male family members; thus, we examine IHDS survey questions related to women's mobility and decision-making. Category (2) includes whether widow remarriage is prohibited; whether dowry is practiced; and whether a women had a say in her choice of spouse. For food taboos (category 3), we include whether anyone in the household consumes meat; whether any household member consumes alcohol; and whether men in the household eat meals before women do (the Manusmriti explicitly instructs men to do this). Lastly, under (4) inter-caste interactions, we analyze whether intercaste marriage is prohibited and whether the household practices untouchability towards Dalits.

In column 1 of Table 1, we present the mean of each outcome among Adivasis. In columns 2 through 4, we show the difference in average purity norm adherence between Adivasis and low-rank castes, middle-rank castes, and high-rank castes, respectively. Overall, the summary statistics shown in Table 1 highlight the *Sanskritization* that has occurred among all ethnic groups: even among Adivasis, who are outside of the caste system, almost a third report that their community disallows widow remarriage and almost two-thirds report that they practice female veiling (*purdah*). Among Dalits, the castes within the low-rank group, purity norm adherence is similar to that of Adivasis: with the exception of the practice of dowry, the differences between these groups are small in magnitude and most of them are not statistically significant. This is consistent with the hypothesis put forward by our conceptual framework: since Dalits have low inherited rank, and therefore low return to investments in purity norms, their average take-up is low.

Conversely, middle-rank caste groups—who, as we discuss in Section 2.1, did not historically practice most purity norms shown in Table 1—have today significantly (economically and statistically) higher take-up of purity norms than Adivasis. Middle-rank castes are less likely to report that women have ever worked, are allowed to work, make the decision to work, or are mobile outside the home. These caste groups are also significantly more likely to practice food and alcohol taboos, prohibit widow remarriage, practice dowry, and practice untouchability against Dalits. The point estimates on high-rank castes (column 4) are almost always larger than those in column 3, consistent with the historical evidence.

We standardize norms variables to the Adivasi mean and standard deviation and present a set of summary indexes in Figure 4. This figure shows visually adherence to purity norms is

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[23]We include Rajputs, the "king" or "warrior" caste, alongside the Brahmins because the Manusmriti often groups them together under the category of "twice-born" castes.

[24]The Indian government categorizes Hindu castes into the following categories: General, Other Backward Castes, and Scheduled Castes. These rankings are used for affirmative action programs and other administrative purposes, but do not correspond to purity rankings or social relations between castes (Munshi, 2019).

decreasing as Hindus are further in social distance from Brahmins and Rajputs. Taken together, these descriptive statistics are consistent with the idea that Hindus use adherence to purity rules as a means of upwards social mobility—in other words, to assimilate with Brahmins or Rajputs. To understand how the decision to invest in purity norms is influenced by the local social and economic environment, we now turn to our analysis of the impact of Adivasi share on purity norms adherence.

5 OLS Estimates

Hindu and Adivasi integration in Central India occurred between the 18th and 20th centuries, when Hindus in-migrated to the previously Adivasi-dominated region (see Section 2.1). The ethnic composition of villages has remained almost unchanged since that time: 93% of households in the IHDS rural sample for Central India report that their family has been living in their village for over 90 years.[25] We begin our analysis by examining the cross-sectional relationship between Adivasi population share in these villages and Hindus' adherence to purity norms.

5.1 Empirical Specification

Our empirical analysis of the IHDS survey data estimates two main regression specifications:

$$y_i = \alpha + \phi_1 AdivasiShare + \gamma X_i + \delta Z_v + \theta_s + \epsilon_i \tag{1}$$

where y_i is an individual or household-level outcome for Hindu households; $AdivasiShare$ is the Adivasi population share in household i's PSU (village); X_i is a vector of controls for the age and marital status of the respondent as well as the age of the male and female household heads; Z_v is a vector of village-level controls for distance to urban centers; and θ_s is a state fixed effect. Standard errors are clustered at the PSU level.

In Figure A1 we plot the distribution of $AdivasiShare$ across the 648 PSUs that make up our IHDS sample. Adivasis make up 12% of the average village population though over half of villages have no Adivasi presence. Conditional on at least one Adivasi in the village, the average Adivasi share of the village is 30%.

We report results of Specification 1 in Panel A of Tables 2–3 and A3–A5. In Panel B of these tables, we separately estimate the relationship between $AdivasiShare$ and the outcome variable for high-rank castes (γ_2), middle-rank castes (γ_1), and low-rank castes (γ_3) using the following specification:

$$y_i = \alpha + \gamma_1 Middle * AdivasiShare + \gamma_2 High * AdivasiShare + \gamma_3 Low * AdivasiShare$$
$$+\gamma_4 High + \gamma_5 Low + \beta X_i + \delta Z_v + \theta_s + \epsilon_i \tag{2}$$

where $High$, $Middle$, and Low are binary indicators for the caste rank group to which the respon-

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[25]This is true both for Hindu and Adivasi households and does not vary with Adivasi population share.

dent belongs.

5.2   OLS Results

Hindu women's work and political participation   In Table 2, we present results on work outcomes and norms. On average, 46% of Hindu women who live in a village with no Adivasis report ever having worked. In Panel A of column 1, we see that Hindu women are nearly 50% more likely to have worked as the share of Adivasis in her village increases from zero to one. In columns 2 and 3, we see that the probability that Adivasi share is positively correlated with whether a woman reports being allowed to work and whether she makes the decision of whether she works or not. In column 4, we see that Adivasi share has substantial consequence for the earnings that a woman reports. When Adivasi share in a village is 1, women report earnings 71% higher earnings.

In Panel B of Table 2, we show results by the caste rank of the respondent. Consistent with our model predictions, we see that Middle Rank castes are the most impacted by Adivasi share across a range of work outcomes. In column 1, High status caste women report ever working only 21% of the time when there are no Adivasis in the village and their probability of working is not affected by Adivasi share. Dalit women in no-Adivasi villages are nearly four times as likely as high status caste women to have ever worked, and similarly their probability of working is not impacted by the presence of Adivasis. Lastly, we see that 43% of middle status caste women report ever working. Shifting Adivasi share to 1, increases the probability of work for these women by 27 percentage points, or 63%. Middle status caste women converge to the rate of work of Dalit women in no-Adivasi share villages.

We next examine changes in the political participation of Hindu women (Table A2). We start by considering the share of women among elected village representatives. We restrict our analysis to seats that have not been reserved for quotas for women or underrepresented groups (scheduled castes and scheduled tribes/Adivasi) in the most recent election. Column 1 shows that the female share among elected village representatives increases with Adivasi share. While this effect might come in part from higher political participation rates of Adivasi women, we also observe an increase in the female share if we restrict the sample to Hindu politicians (column 2). In column 3, we further show that the likelihood that Hindu women discuss politics with their husbands increase by 16% as the Adivasi share in the village increased from zero to one. The results are noisy but significant at the 10% level.

Purity Norms Outcomes   In Table 3, we report the relationship between Adivasi share and a broad set of norms outcomes. As discussed in Section 3, the broad norms catergories match the four norms categories outlined in the Manusmriti (women's seclusion, food taboos, marriage restrictions, and restrictions on intercaste relations) and questions from the IHDS are matched to Manusmriti verses. Each question within the index is normalized and aggregated to generate each broad norms index. In Panel A, we normalize the indexes to the outcomes of no-Adivasi share villages. In Panel B, we normalize to the outcomes of each caste group separately.

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Looking at Panel A, we see that across all outcomes, a higher Adivasi share is associated with lower norms compliance by caste households, all significant at at least the 5% level. In column 1, we see that a shift from a no Adivasi PSU to one with an Adivasi share of 1 is associated with a 27 percentage points decline in the pratice of purdah (female veiling). Hindu caste women are also more mobile and more likely to be involved in household decision-making in villages with higher Adivasi shares. The components of the food taboos index are presented in Appendix Table A5 and the components of the marriage and intercaste restrictions indexes are in Appendix Table A4. Adivasi share of 1 is associated with a nearly 50% drop in the likelihood that the household is vegetarian, a 20% decrease in the likelihood that the household consumes alcohol, and a 61% decrease in the probability that the men in the household eat before the women. All estimates are significant at at least the 5% level. Turning to marriage and intercaste relations restrictions, we see that the coefficient on Adivasi share is always large and negative, but is statistically significant only for whether widow remarriage is prohibited in the household's caste in the village, in the likelihood that the woman was not consulted in the selection of her spouse, and importantly in untouchability of Adivasis. When Adivasi share is 1, caste households are 0.1 percentage point less likely to say they do not accept water from Adivasis, compared to a mean of 0.14 in villages with 0 Adivasi share. So shifting a caste household from a no-Adivasi share village to the average village with at least one Adivasi is associated with caste households being 21% less likely to practice untouchability.

In Panel B, we disaggregate the effect of Adivasi share by caste grouping. Consistent with Table 2, middle status castes are significantly less likely to practice purity norms in the presence of higher Adivasi PSU share. For female veiling and the (inverted) mobility index, the coefficients are large and negative and we can reject at the 1% level that the effects for high and middle status castes are the same. In the case of Dalits, the effect of Adivasi share is always negative on the norms indexes and significant for all outcomes except the intercase relations index. For food, the coefficients are half as large as for the middle status group, but we cannot reject equality for any of the outcomes. hlOverall, we take the results to be suggestively consistent with the predictions of the model.

5.3 Robustness and Validity Checks

Hindus and Adivasis did not settle randomly and, as such, there is the concern that the Adivasi-share effects may be endogenous to other features of the local social or economic environment. First, there is the possibility that differential selection in- or out- of Adivasi villages drives our results. However, we believe this to be unlikely: 93% of households in the IHDS rural sample for Central India report that their family has been in their current village for at least 90 years (the maximum possible response). For most castes, adoption of purity norms regarding marriage rules, women's role in society, and food taboos has only occurred within the past 100 years (Figure 3). Given this, there is not a strong reason to believe that these caste groups would have selectively migrated in to Adivasi villages based on their own purity norm preferences.

A second potential concern is that unobservable factors common to Adivasi villages, such as differential access to markets, may have direct effects on Hindus' practice of purity norms. In

order for such an unobservable factor to explain our results, it would have to be something that differentially affects middle-rank Hindus versus Adivasis and high- and low-rank Hindus. Standard economic explanations (such as remoteness or differential infrastructure) could not easily explain, for instance, why middle-rank Hindu FLFP increases with Adivasi share but that Adivasi FLFP and high- and low-rank FLFP are unaffected. Moreover, we find impacts of Adivasi presence across a wide range of Hindu cultural practices. This makes it less likely than an unobservable feature of the economic environment drives our findings. In Appendix Tables A6 and A7, we further address this concern by including village fixed effects in our estimation of the impact of Adivasi share on Hindu adherence to purity norms. Though effects are noisily estimated, we continue to find impacts on middle caste-rank women's ability to work and on middle caste-rank households' adherence to marriage restrictions, food taboos, and limits on inter-caste interactions. This suggests that unobservable factors common to Adivasi villages could not fully explain the impacts we observe and provides further evidence for the argument that Adivasi presence has a direct impact on Hindus' adherence to purity norms.

Finally, we provide evidence on the role of norms transmission by exploiting heterogeneity in gender attitudes *among* Adivasi groups. An important distinction among Adivasi groups is that while some groups historically practiced plough agriculture, other groups historically practiced shifting agriculture.[26] Ethnographic and empirical evidence shows that societies which formerly practiced shifting agriculture — a method of cultivation which employs more female labor — have higher rates of women's work and more equal gender norms today (Boserup, 1970; Alesina et al., 2013). We therefore hypothesize that Adivasi groups which historically practiced shifting agriculture should have higher rates of female labor force participation; and, as such, norms transmission to caste groups should be stronger in these villages.

The IHDS asks households to list the name of their caste or tribe. We match these tribe names to a dataset which contains information on each tribe's historical agricultural practices, which we created using ethnographic data on Adivasi groups. In Table 8 we compare village-level characteristics of villages in our sample. We regress the village level characteristic on the share of plough Adivasis in the village and on the share of non-plough Adivasis in the village. while villages with Adivasis are different than non-Adivasi villages, we can't reject equality of coefficients on non-plough and plough Adivasi share.

Table A8 shows the results of the analysis on female labor force participation. Consistent with the hypothesis outlined above, we find that Adivasi women who belong to Adivasi groups which used to practice shifting agriculture are 11.5 percentage points more likely to work outside the home for pay today (Panel A). Panel B shows the result of a regression of Hindu women's work participation on the share of the village population that belongs to a shifting or plough agriculture Adivasi group. We find that the increase in caste women's likelihood of working is driven entirely by historically shifting agriculture Adivasi groups. The sample for Table 5 includes Adivasi women

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[26] All Adivasi groups in Sambalpur now exclusively practice plough agriculture.

(Panel A) and Hindu women (Panel B) across Central India. This finding is also replicated in Figure A2, which shows a local polynomial regression of Hindu FLFP on Adivasi share, separating Adivasi groups into those that practiced plough versus shifting agriculture.

6   Spatial Regression Discontinuity Estimates

Despite the robustness of our OLS estimates and the fact that we observe Adivasi-share impacts across a range of purity norm outcomes, there remains the concern that there are unobservables that may be biasing our estimates. For example, remoteness to urban centers may differentially affect middle caste rank Hindus. Given this possibility, we also undertake an alternative estimation strategy: we exploit a historical natural experiment that led to variation in village-level Adivasi share among villages within a narrow geographic area. In this section, we first discuss the relevant historical context; then our estimation strategy and identification assumptions; finally, we present results of our RD analysis.

6.1   The Railroad and In-Migration to Sambalpur, Odisha

Our causal analysis exploits variation in Adivasi share due to the in-migration of Hindu households following the 1894 construction of a railroad stop in Sambalpur, Odisha.[27] The district of Sambalpur was taken over by the British colonial government in 1849 upon the death of the former Raj.[28] Sambalpur, which sits on the eastern edge of the former Gondwana Kingdom, is situated over 300 kilometres from Cuttack, the coastal city and capital of British Orissa at that time.[29] Prior to the opening of the railroad, the district was isolated with minimal trade or in- or out-migration to neighboring areas (Nethersole 1874; 1885). The existing trade route was the Mahanadi River, which bisects Sambalpur from north to south and flows to Cuttack and other coastal cities. Rice was and continues to be the dominant crop in Sambalpur.

The population of Sambalpur even prior to the railroad construction was multi-ethnic: among the 19 largest landowners in 1889, 12 were Gond, 2 belonged to a different Adivasi tribe, and the remaining 5 belonged to various Hindu cultivator castes (Russell 1889). The railroad construction in 1894 led to an additional surge of Hindu migrants from neighboring districts: In the words of the British Settlement Officer at the time, the construction of the railroad stop in Sambalpur "doubled the price of rice and changed the run of trade [from downstream the Mahanadi to northwards along the railroad]" which brought "an invasion of Hindu cultivators" to what had previously been a predominantly tribal area (Dewar, 1908). The Sambalpur stop was the terminus of a branch line from the main Bengal-Nagpur line (Figure 2). While the districts directly to the north, northwest, and northeast of Sambalpur were served by the main line, the station in Sambalpur City became

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[27]We use the term Sambalpur district to refer to the region of that name as it was defined in the British Colonial period. This region was later subdivided and now includes Bargarh, Jharsuguda, Nuapada and Sambalpur districts in the state of Odisha and parts of Mahasamund and Raigarh districts in the neighboring state of Chhattisgarh.

[28]The British colonial government at the time had a policy of annexing native (non-British controlled) states if the ruler died without an heir. See Iyer (2010) for further discussion.

[29]The former state of Orissa was renamed as Odisha in 2011.

the nearest railroad access point for not only Sambalpur district, but also the states directly to the southwest (Baud, Patna, and Sonpur), and southeast of Sambalpur (Athmallik and Rairakhol). These states (shaded in gray in Figure 2 below) became the main sending areas for Hindu migrants to the areas around the Sambalpur railroad station.

The Mahanadi River Boundary   Our treatment area of interest is the set of villages close to the Sambalpur railroad station, located on either side of the Mahanadi River. This key feature of Sambalpur geography restricted the settlement locations of new Hindu migrants: the river, which is almost a mile wide in parts, constrained population movement between the east and west sides.[30] This is because, at the time of the railroad station construction, the river only had one crossing in Sambalpur district: a pontoon bridge located at Sambalpur City, directly at the site of the new railroad station (Dewar, 1908; Deloche, 1993). Migrants, who arrived in the area after walking with their families and belongings from areas up to 200 kilometres away, settled in the plains surrounding the railroad station where they found land available (Dewar, 1908; O'Malley, 1909). Cultivable land was abundant; in 1889, only 56% of total land in the district was cultivated or under other use (Russell 1889). In general, cultivators did not bring their rice paddy directly to the railroad station; rather, they brought their paddy on head-loads down village paths to traders stationed along the primary district road, which ran from west to east through the district (Figure 2). Thus the difference in market accessibility for a cultivator located, for instance, along the district road 10 kilometres from the river on the east versus the west side was marginal: the only difference was the need for a trader who purchased on the west side to additionally transport the paddy across the pontoon bridge.

That migrants tended to settle on the side of the river from which they had come is also borne out in the historical land records data. We digitize individual land records from 1915 for a sample of 204 villages in our RD sample area in Sambalpur. These land records contain the name and ethnicity of every household in a village at that time. We use ethnicity names to determine whether a household was a likely migrant from the period after the introduction of the railroad in 1894. Most Hindu caste ethnicities present in Sambalpur prior to the railroad were also present in the neighboring states; however, we identify two Hindu caste groups *not* present in Sambalpur prior to the railroad but that were present in neighboring states. The *Bhulia* caste is described as being a dominant group in Sonpur state, to the southwest of Sambalpur while the *Chasa* caste is described as a primary ethnic group in Rairakhol state, to the southeast. Our digitization of the 1915 land records shows that Bhulia caste individuals held land in villages to the west but not east of the Mahanadi River in 1915; the reverse is true for individuals from the Chasa caste.

Our empirical analysis will exploit the discontinuous change in Adivasi population share at the Mahanadi River boundary due to higher levels of in-migration of Hindus on the west versus east

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[30]The description of population settlement after the introduction of the railroad draws heavily from the 1906 Sambalpur British Land Settlement Report, which includes a detailed accounting of population movement and market access during the prior decade.

Figure 1: Sambalpur District in 1906

Notes: The Mahanadi River is shaded in blue and the red arrows represent the direction of migration.

sides of the river. The historical record documents several causes of this difference in the magnitude of migration. The first and primary reason is differences in geography: to the east and southeast of Sambalpur, at the border with Rairakhol state, there is a hill range covered in dense forests. The hill range is described at the time as being "almost impassable,"[31] and, beyond it, the states of Rairakhol and Athmallik were both very isolated and sparsely populated. At the time of the railroad construction, Athmallik was home to only 56 persons per square mile and Rairakhol to 32 persons per square mile. They were two of the three least densely populated states in Orissa (Cobden-Ramsay, 1910). In contrast, the fertile and open plains that characterize the villages on either side of the Mahanadi River near to the railroad station continued westwards and southwards into Baud, Patna, and Sonpur states. These three states had population densities of 70, 116, and 188 persons per square mile, respectively. In other words, there was both a larger population of would-be migrants in areas to the west and southwest and the travel required for these migrants was less costly.[32] The second reason for the larger number of migrants from the west and southwest is that there was poor weather and a resulting famine in the area in 1899-1900. Patna and Sonpur states were especially badly affected, leading to an additional surge of migrants towards Sambalpur (which was less badly hit) in that year. The British Settlement Officer described the situation thusly: "crowds of aimless wanderers [from Patna and Sonpur]...flocked to the relative Eden that was Sambalpur" (Dewar, 1908). Though village-level census population data is not available for this period, the 1906 British Land Settlement Report for Sambalpur notes that only four villages

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[31]Orissa Historical Research Journal, vol I., 1952.

[32]The historical record and our own qualitative interviews with village elders in our RD sample areas confirm that some migrants from Rairakhol and Athmallik did, in fact, traverse the forested areas to settle in Sambalpur post-construction of the railroad. Our aim here is only to highlight the difference in relative magnitude of migrants.

in the district grew sufficiently over the decade from 1891-1901 to surpass a population of 2,000 individuals: these four villages are all located to the west of the Mahanadi River (Dewar, 1908).

Prior to the 1894 influx of Hindu migrants, the British colonial government had mapped the full Sambalpur region and divided it into village administrative units, each with their own hereditary headman. Thus new migrants to the Sambalpur area settled into existing villages, expanding the area under cultivation. In addition to the village headman, who collected taxes from individual households and acted as a liaison with the British government, each village had a watchman who was in charge of resolving disputes and reporting crime to the British. This structure of local governance was common to villages on the east and west side of the river (Dewar 1906; Hamid 1921).

6.2 Regression Discontinuity Empirical Specification

We exploit the discontinuous change in Adivasi share of the population on either side of the Mahanadi River boundary to estimate a causal effect of Adivasi share on our outcomes of interest. Our empirical specification is the following:

$$y_{i,v} = \alpha + \gamma East + f(\text{location}_v) + \beta X_{i,v} + \epsilon_{i,v} \tag{3}$$

where $y_{i,v}$ is the outcome of interest for individual i in village v and $East$ is an indicator variable equal to 1 if the village is on the eastern side of the Mahanadi River boundary and zero otherwise. $f(\text{location}_v)$ is the RD polynomial, which controls for smooth functions of geographic location for village v. X_i is a vector of covariates for individual i, which include age, survey date fixed effects, and enumerator fixed effects.

Following Calonico et al. (2014) and Gelman and Imbens (2019), our baseline specification is a local linear polynomial in distance to the river estimated separately on the west and east sides. Our preferred specification will use a fixed bandwidth of 20 km to the left and right of the river and a triangular kernel. We also calculate the optimal bandwidth using Calonico et al. (2020) mean-squared-error minimizing procedure. Our results are highly robust to robust to using a variety of alternate bandwidths (Appendix Figure A3) and kernels (Appendix Figure A4). We further report Conley standard errors with a cut-off window of 10 kilometeres to account for spatial auto-correlation (Conley, 1999) as well as p-values computed using a randomization exercise in which we randomly re-assign distance to the river (Appendix Tables A9 and A10.

Our coefficient of interest is γ, which can be interpreted as the impact on a Hindu household of residing in a village just to the east side of the Mahanadi River. The key identifying assumption for the regression discontinuity approach presented in Specification 3 is that all relevant factors besides treatment vary smoothly at the river boundary. This assumption is needed for Hindu individuals located just across the river on the (lower Adivasi share) western side to be appropriate counterfactuals for Hindu individuals on the (higher Adivasi share) eastern side. The intuition behind our specification is that, absent the influx of Hindu migrants in 1894-1900 to the western

side of the river, villages directly to the east and west of the river would have similar levels of Adivasi share of the population. They should also be comparable in terms of geography, historical governance institutions, and traditional norms of caste households. This allows us to identify the impact of the average difference in Adivasi share between villages east and west of the river on Hindu women's labor force participation and purity norms among Hindu households.

To assess the plausibility of our identifying assumption, Panel A of Table 4 examines a variety of geographic characteristics. Agriculture is the primary source of employment for both men and women in villages in our sample area and rice is the primary crop. Table 4 shows that villages on either side of the river boundary are balanced in terms of elevation, flow accumulation, rice suitability, and forest share. We do, however, find that villages to the east side of the river have steeper slope, which may indirectly affect crop output. In Appendix Figure A4, we replicate our main analysis controlling for geographic characteristics and find that estimates are consistent.

In Section 6.1, we show historical evidence that villages to the east and west side of the river were similar in terms of ethnic composition and other relevant factors prior to the introduction of the railroad. To further validate this assumption, we collect and digitize individual land records from 1887 for households in our regression discontinuity sample. These land records contain information on each household's caste or tribe, as well as their total landholdings. Columns 1 and 2 of Panel B in Table 4 show that villages are balanced in terms of Adivasi population share and Adivasi land-ownership share prior to the introduction of the railroad.[33] In Column 3 of Panel B in Table 4, we further utilize the land records to show that villages on either side of the river were balanced on an important measure of Adivasi political and economic power prior to the 1894 in-migration shock: we find that 15.4% of villages had Adivasi village headman, and that this share does not differ in villages east versus west of the river.

A second possible threat to identification is that the construction of the railroad could have differentially impacted households on either side of the river. For instance, villages on the eastern side, where the railroad is located, may have better access to agricultural markets. However, as we discuss in Section 6.1, the railroad station is directly at the river boundary. Thus except for the distance of the actual crossing of the river (there was a pontoon bridge at the railroad station crossing), households on either side of the river were equidistant to the railway station. To further validate the assumption of equal access to markets, we are also in the process of digitizing 1961 village notes completed by government officials that contain information on price of rice paid to cultivators in each village at that time, along with other measures of local agricultural markets. A preliminary analysis of records for 40 sample villages shows that the historical price of rice was similar on both sides of the river. As a last point of evidence for this assumption, we examine whether agricultural output and prices vary across the river in the present day. Column 2 of Table A11 shows that the revenue received by rice farmers in villages east of the river is not significantly

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[33]We are able to find complete land records for 117 of our sample of 142 villages. The share of missing records is not differential on the east versus west side of the river.

different from the price of rice received by farmers west of the river. Farmers on both sides of the river are equally likely to hire women (Column 1 of Table A11) and, consistent with the fact that female labor supply is higher in villages east of the river, we find that the wage for female labor is 19% lower in east-of-river villages (Column 4). We find that farmers east of the river report 17% higher output per acre, potentially as a result of an increase in the intensive margin of female labor usage or because cost savings on labor are put towards other inputs.

Our third identification assumption is no selective sorting of incoming caste migrants across the river boundary. In Section 6.1, we provide historical evidence that migrants arrived primarily from regions to the south-west of our study area and that the presence of the river made it costly for them to settle in the east: there was only one river crossing in the district (at Sambalpur City) and crossing was via a pontoon bridge or ferry, both of which had fees. However, it is possible that certain caste migrants, such as those with a greater affinity for Adivasi people or those who had more equal gender norms, were more likely to be willing to pay the higher effort and monetary cost to settle on the eastern side of the river. We cannot rule out this possibility, but we note that this would have been an unlikely scenario: at the time of caste households' migration, adherence to purity norms among non-Brahmin castes was low.

6.3   Regression Discontinuity Results

We now turn to the results of our regression discontinuity analysis. Table 5 uses the Socio-Economic and Caste Census from 2011 and limits the analysis to our sample villages. In column 1, we show the village-level Adivasi share and in column 2 we show caste women's labor force participation. Consistent with the historical evidence discussed in Section 6.1, villages just east of the river have roughly 25 percentage points higher Adivasi share. On average, villages west of the river have 25% Adivasi share, so being east of the river is associated with a 100% increase in the fraction of Adivasis in the average village. In column 2 we see that caste women in villages directly east of the river are 10 percentage points more likely to report that their primary occupation is one which involves work outside the home for pay.

Figure 5 presents standard RD plots for Adivasi share and Hindu FLFP, with distance to the river as the running variable and a local linear trend to each side of the discontinuity. We observe there is a clear discontinuity at the river point in terms of Adivasi share. With one exception, the average Adivasi share in each distance bin is always lower on the west side of the river. In the second panel, we see that on both sides of the river, being closer to the river is associated with higher caste FLFP. Again, we observe the discontinuous jump at the river boundary and, within each distance bin, the share of women who work on the east side of the river is always higher than on the west side. In Table A3 we show results varying the bandwidth and in Table A4 we show results using alternate kernels (e.g. uniform and Epanechnikov instead of triangular); results remain consistent with those shown in Table 5.

6.3.1 Evidence on the Transmission of Gender Norms from Adivasi to Hindu Households

We now turn to our survey data to investigate impacts on norms. In columns 3-8 in Table 5, we present results on women's labor force participation as well as norms related to women's work. We asked respondents to report the primary occupation of their wives. On average, Hindu women's primary occupation on the west side of the river is worker 34% of the time. This is about 9 percentage points higher than the estimate in the SECC. In column 3 of Table 5, we see a 0.14 percentange point (or a 43%) reduction in the probability that a Hindu woman is a housewife. The point estimate is statistically indestinguishable from the point estimate in column 2 using the SECC data. In column 4 we also see that caste women are almost twice as likely to have worked outside the home for pay in the previous 30 days.

We asked husbands to report their own and community beliefs about the appropriateness and desirability of women's work. In columns 5 - 6, are own beliefs. In columns 7 - 8 we ask respondents to provide second order beliefs - what they believe other households in their caste in their village think. In columns 5 and 7, we see that respondents on the east side are more likely to report whether they think it is appropriate for women to work even if even the household does not have a financial need and that the community believes it is appropriate for women to work, although only the latter is significant (at the 10% level). To understand the role of working women in the community, we presented respondents with a vignette that asked them to imagine hypothetically choosing one of two wives for their marriage-age son. Both women come from the same caste as the respondent and have exactly the same financial circumstances as each other, but one wife prefers to stay at home and only look after domestic duties while the other prefers to work outside the home for pay. Respondents on the east side of the river are 35% less likely to prefer a daughter-in-law who wants to be a housewife. Consistently they report that other households in their caste in their village are less likely to prefer the housewife to the working woman.

We further observe a meaningful upending of other purity norms, including restrictions regarding caste interactions and adherence to food taboos, on the east side of the river. In column 1 of Table 6, we note that nearly two-thirds of caste households west of the river would not touch water that an Adivasi has touched - a practice akin to perceiving an Adivasi as "less than human".[34] The practice was officially abolished in the Indian Constitution and the Indian Parliament has passed a variety of laws since independence (the latest in 2018) to define forbidden practices as well as punishments for violations. Nonetheless, between 1991 and 2020, there were over 700,000 instances of violence due to untouchability, including the rape of 38,000 women.[35] Strikingly, caste households east of the river are 46% less likely to practice untouchability tiwards Adivasis and 7% less likely to practice untouchability towards Dalits (columns 1 and 2).

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[34] National Geographic, 2003

[35] Statistics for Dalits. https://indianexpress.com/article/opinion/columns/in-the-death-of-a-dalit-student-betrayal-of-the-vision-of-freedom-8093920/

Perhaps the most surprising result indicates a shift not only in the personal practice of purity norms, but in the conception of social stratification itself. We gave respondents a list of all the castes and Adivasi groups that were represented in their village and asked them to rank the list in terms of social status in their community. In column 3 we show a dummy variable that indicates that the respondent ranks Adivasis as highly or more highly than a middle status caste.[36] Caste respondents east of the river are almost three times as likely to rank Adivasis at least as highly in the social hierarchy as a middle status group. Consistent with an upending of purity norms, we further observe that caste households east of the river adhere less to food taboos (column 4).

Our results are robust to various changes to the specification, including alternative bandwidths (Appendix Figure A3), alternative kernels, second-order RD polynomials, the inclusion of geographic controls (Appendix Figure A4), and accounting for spatial correlation (Appendix Table A9). We also calculate standard errors for each of our main outcomes based on randomization inference by randomly re-assigning the distance to the river for each sample village 1,000 times (Dell et al., 2018). For each iteration, we then repeat our analysis based on the re-assigned indicator for whether the village is located on the east side of the river. The p-value is calculated as the share of the placebo coefficients that are larger in magnitude than the actual coefficient on the east side dummy (in absolute terms). Appendix Table A10 shows that our results also hold in this exercise.

Alternative Explanations for the Relationship between Adivasi Share and Hindu Women's Work   We argue that higher Adivasi share leads to an increase in caste women's supply of labor through decreasing the social stigma surrounding women's work for caste households. We now evaluate alternative labor demand- or supply-based explanations for the observed relationship:

The presence of Adivasis in a village community may increase landowners' demand for female agricultural labor through increasing either the real or perceived returns to hiring women. For instance, fixed costs to hiring women may lead landowners to only hire male laborers when the pool of female laborers is small. If this were the case, we should also see that the rate of Adivasi women's work also increases with Adivasi share. But as shown in Figure 2, Adivasi female labor force participation does not change with their population share in the community. The presence of Adivasis in their village community may instead increase labor demand through changing some landowners' perception of the benefits of hiring female labor; in other words, Adivasi share may lead to a shift in attitudes among owners, not laborers. This is unlikely since agricultural labor has traditionally been and continues to be highly gender-segregated in our setting: certain tasks, such as transplanting, are typically done by women while other tasks, such as ploughing, are typically done by men. In Table A11, we cannot reject that landowners on the east and west side are equally likely to hire women (column 1) — the coefficient is noisy, but implies a lower likelihood of hiring on the east side. Moreover, nearly all landowners on both sides of the river express no preference in the caste of the workers that they hire.

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[36]We define the variable to specifically mean that an Adivasi group ranks as highly or higher than an Other Backwards Castes (OBC) caste group.

Our norms-based explanation for the observed increase in Hindu women's work is one of several possible reasons why Hindu women's labor supply might increase as a result of living in a community with Adivasi women. First, Hindu women may be more willing to work outside the home because, through exposure to Adivasi women, they learn and update their beliefs about the costs or benefits of working. A majority of women in our study sample area perform agricultural work on their own land; thus, learning would have to be associated with gains specific to agricultural work on someone else's land. In our survey, we measure possible learning through questions on the following topics: beliefs regarding safety of women working outside the home; knowledge of the daily wage for female labor; and, knowledge of landowners in the village who hire female agricultural workers.

Second, Hindu FLFP may increase with Adivasi share because of complementarities in caste women's labor supply function: for instance, Hindu women may have a stronger preference for safety than Adivasi women. If Hindu women are only willing to work as laborers when there is a sufficient number of other women working, then we would expect their labor supply to increase with Adivasi share. To assess these possible complementarities, we ask respondents from our RD sample survey about safety and preferences for number of women with whom they would work, as well as availability of childcare.

In Table A11, we present a variety of measures related to these two potential labor supply stories. In columns 3 and 4, we see that households east of the river are just as well informed as those west of the river about paid agricultural work opportunities for women as well as current female agricultural daily wages; nearly all respondents in the sample report being informed about both of these outcomes. In column 5, we see that women are equally likely to have access to childcare across both sides of the river. Nearly all respondents on both the west and east side express no preference for the caste of the hiring landowner, the caste of workers for women, and believe that it is safe for women to engage in paid agricultural opportunities in their village.

7   Mechanisms

Our conceptual framework argues that Hindus will be less likely to adopt purity norms when it it costly to exclude Adivasis from economic and social interactions. In Table 7, we analyze the quantity and quality of Hindu-Adivasi interactions in high Adivasi share villages (east of river) within our RD sample.

We asked respondents to tell us about their social interactions with members of their own caste, with Adivasis, and with Brahmins and members of other middle status castes. Specifically, by each of these three subgroups, we ask how many total friends they have, how many they socialize with frequently, how many they ask for personal or business advice, how many could they ask for a loan in case of an emergency, and how many would provide "manpower assistance" (assistance in, for example, setting up for a wedding or another type of event). In Table 7, we analyze each of the questions by group: Panel A shows for own caste, Panel B for Adivasis, and Panel C shows Brahmins or other middle and upper rank castes.

In columns 1 - 3 of Table 7, we show standardized indexes that aggregate outcomes by reference caste group. First, in column 1 we see that Hindu respondents east of the river have very similar social interactions within their own caste group. Looking at Panel A of Table 7, we see no large or any significant differences in the number of friends listed in each category. We do, however, see that respondents east of the river have 0.65 standard deviation unit more interactions with Adivasis than respondents west of the river. In Panel B of Table 7, we see that respondents east of the river report at least double the number of Adivasi friends in total, as well as those they socialize with, ask advice from, and could ask for financial or manpower assistant. Additional social interactions with Adivasis appear to substitute interactions with Brahmins or members of other middle status castes. Across all outcomes in Table 7, we cannot reject that coefficients in Panel B are the same magnitude as those in Panel C.

We conclude our analysis by turning to a distinct setting, where Adivasis are assigned more political and economic power, independent of their population share. In three districts (Feudatory States) of Odisha, the British colonial government assigned the position of village watchman to the village's Adivasi priest (*Jhankar*). In other districts, the status quo was instead to assign position based on merit. The historical record suggests that the decision was ad-hoc, and a response to needing to quickly put in place an administrative structure after death of the former Raj (Russell 1885; Maddox 1901; O'Malley 1909; Hamid 1921; Pati 1986). Importantly, the watchman position carried significant economic benefits: the watchman was given land on which he did not have to pay taxes and was also privy to tax income from all other village households (Central Provinces Land Act, 1882). In addition, the watchman was in charge of resolving village disputes and relaying information back to the British colonial government. Several sources document the political power and social capital of the jhankar in watchmen districts (Dewar 1906; O'Malley 1909; Cobden-Ramsey 1911; Hamid 1921). The watchman position was abolished post-independence, but the 1962 Orissa Land Reform Act allowed *jhankar* households to keep the land that had been historically allocated (Board of Revenue 1962). We therefore argue that the political and economic power of Adivasis was shifted in watchman districts.

To analyze how this shift in Adivasi power affected Hindu households, we create a sample of the blocks (administrative unit below district but above Panchayat) that border one another on either side of the district border. In Table A.13, we compare these blocks on a variety of geographic characteristics. Overall, we do not find significant differences between watchman and non-watchman bordering blocks. Importantly, the Adivasi population share in watchman blocks is statistically equivalent to that across the block border. That being said, we caution against a causal interpretation since there may be unobservable confounders.

For analysis of the impact of increased Adivasi power, we estimate the following specification:

$$y_i = \alpha + \phi_1 WatchmanBlock + \theta_c + \epsilon_i \tag{4}$$

where y_i is an individual or household-level outcome for Hindu caste households. *WatchmanBlock*

is an indicator for whether the block was a watchman block. θ_c is a caste fixed effect.

The results are presented in Table A14. We see that first watchman blocks are, in present day, 30% more likely to have an Adivasi in the position of *jhankhar*. So despite the abolition of the watchman position after independence, there appears to be persistence in the political empowerment of Adivasis. In columns 2 - 5 we then show a variety of purity norms practices by Hindu caste households. Hindu caste households are 17 percentage points more likely to have had an Adivasi priest officiate their wedding and are 7 percentage points less likely to practice untouchability. They are 8% more likely to state that it is appropriate for women to work and almost 20% less likely to practice meat taboos.

Overall, results are consistent with the argument in our conceptual framework that, in settings where out-groups have substantive economic or political power, Hindus caste groups are less likely to adopt norms that create social separations from the out-group.

8   Discussion

In this paper, we examine how the presence of an out-group in their community impacts Hindus' adherence to caste purity norms. Using a number of estimation strategies, including a historical natural experiment, we show that caste norms weaken when Hindus in central India live in villages with Adivasis, an indigenous group outside the caste system. We find that increased Adivasi population share is associated with decreased adherence to caste purity norms regarding women's seclusion and role in society, food taboos, and inter-caste interactions. When they have more Adivasi neighbors, Hindu women are more likely to work and have substantially higher earnings. They are also more empowered along a number of dimensions. When less constrained by caste norms, Hindus have stronger social and economic relationships both with Adivasis and with Hindus of low caste rank. We conclude from these findings that the presence of Adivasis leads to reduced social stratification within mixed Adivasi-Hindu communities.

One implication of our results is that policies that give additional political or economic power to Adivasis or other marginalized groups, such as Dalits, could not only lead to reduced discrimination against those groups, but may also change caste norms among the broader Hindu population. More broadly, by demonstrating how adoption of caste purity norms that are costly to women is at least partly an economic and social choice, as well as a religious one, we highlight how reductions in India's female labor force participation can, potentially, be corrected by policy.

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Figure 2: Adivasi Population Share and Women's Work Outside the Home
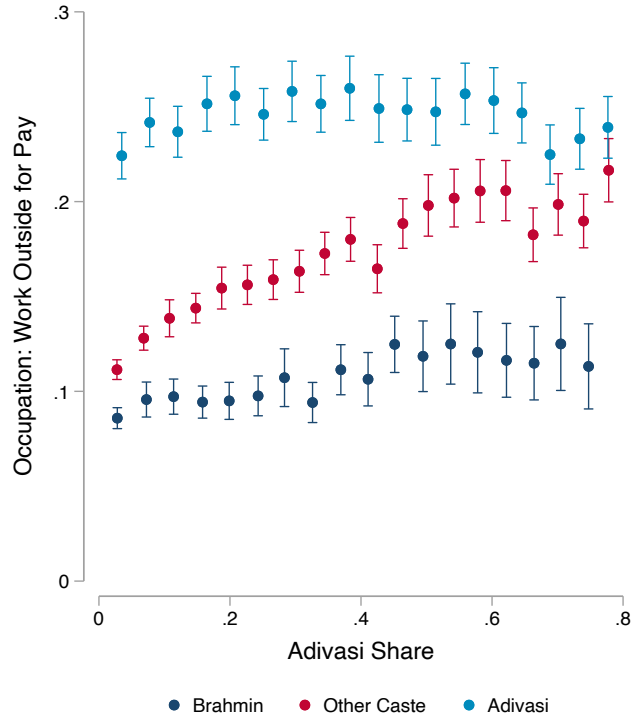
Notes: The figure is constructed using individual-level data on caste women aged 25-64 years from the 2011 Socio-Economic and Caste Census. The outcome on the y-axis indicates whether the Hindu woman worked based on the classification of a free-text occupation question (not including work on own farm). The x-axis represents the share of individuals who are classified as scheduled tribes in the village based on the 2011 population census. The figure plots binned means separately for Brahmins, other caste households, and Adivasis.

Figure 3: Purity Norms Adoption in the 20th and 21st Centuries by Caste
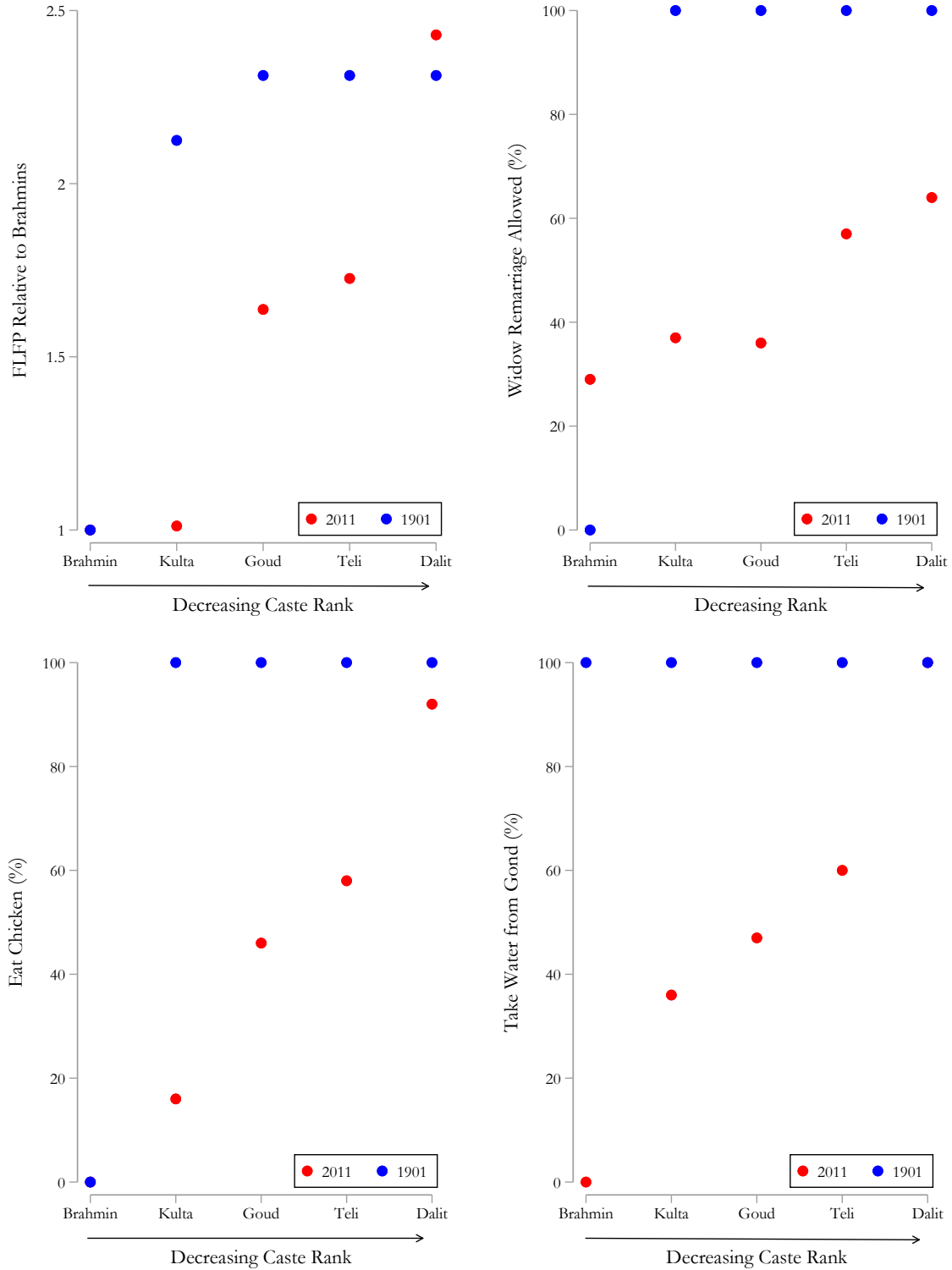
Notes: The figure plots the adoption of purity norms against caste rank over time. The caste ranking is from the 1901 British Census of India. The female labor force participation data for 1901 is obtained from the 1901 Census of India and for 2011 is obtained from the 2011 Socio-Economic Caste Census. The historical purity norms data is obtained from: The 1885-1889, 1906, and 1921 Reports on the Land Settlement of the Sambalpur District; Correspondence on the Revised Land Settlement Report for the Years 1900-1910 for the Sambalpur District; and The 1909 and 1915 Imperial Gazetteers for the Sambalpur District. Historical data is validated against contemporaneous ethnographic evidence, see Data Appendix for details. The present-day purity norms outcomes are obtained from primary survey data collection in Odisha (see Section 4).

Figure 4: IHDS Adoption of Purity Norms by Caste Group
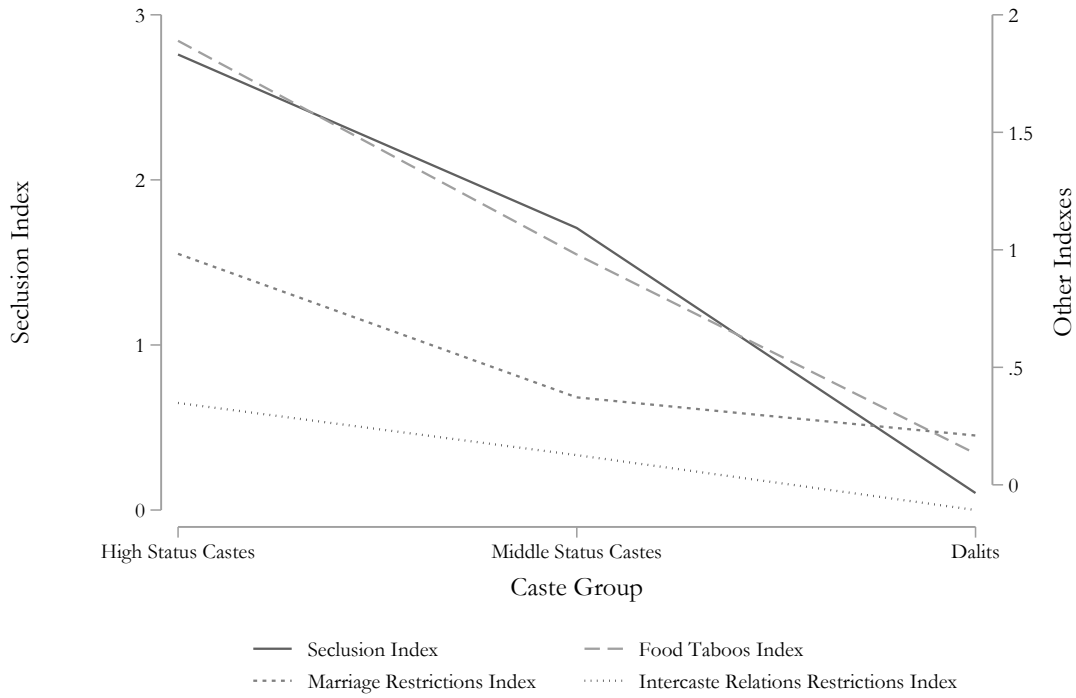
Notes: The figure is constructed using data from IHDS (2011). The sample includes all caste households in central states: Andhra Pradesh, Chhattisgarh, Gurajat, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, and Telengana. High rank castes consist of Brahmins and Rajputs, and middle rank castes consist of all other castes besides Dalits. See Appendix Tables A3, A4, and A5 for index components. The seclusion index combines the practice of purdah with the inverted decision-making index.

Figure 5: RDD Plots
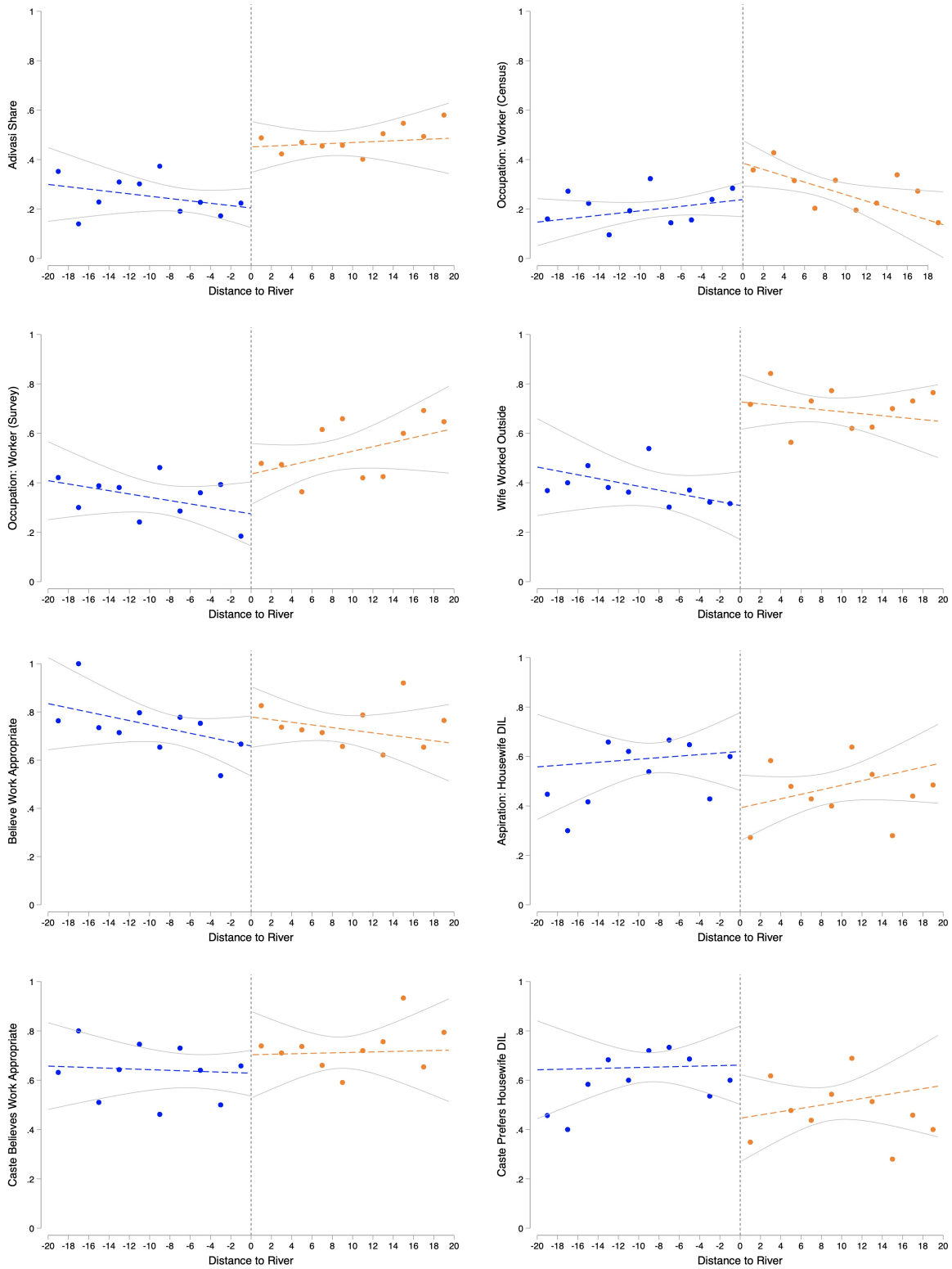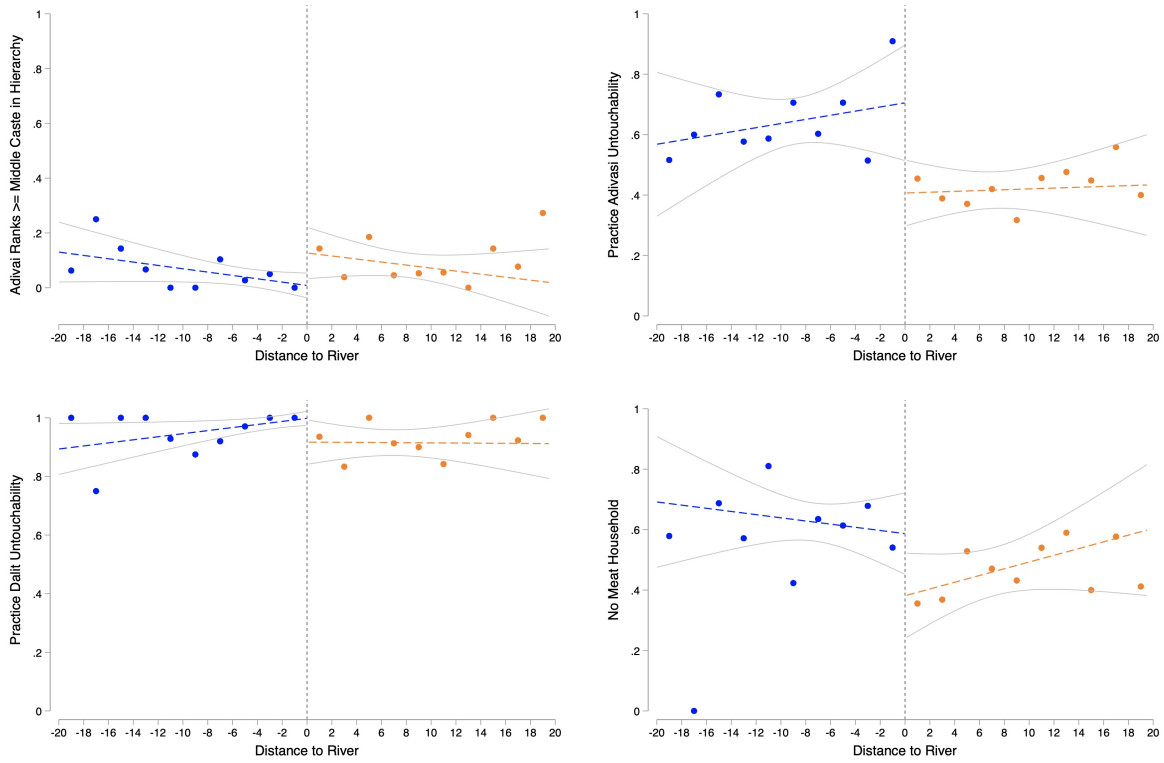
Notes: The figures show RD plots for our main outcomes. Each dot represents the outcome mean within a 2km bin. The local linear trends are estimated separately on each side of the river using a triangular kernel. Standard errors are clustered at the village level. The range plots correspond to 95 percent confidence intervals. The sample consists of 143 villages on either side of the Mahanadi River. The first figure shows village-level Adivasi share based on the 2011 population census. The second figure shows female labor force participation rates based on individual-level data from the Government of India's 2011 Socio-Economic and Caste Census. The remaining outcomes are obtained from our own surveys with Hindu caste men and village elders. See Tables 5 and 6 for outcome definitions.

Table 1: Average Purity Norms by Caste Group

	(1) Adivasi Mean	(2) Low Rank Difference	(3) Middle Rank Difference	(4) High Rank Difference
Panel A: Seclusion				
Ever Worked	0.76	-0.03*	-0.29***	-0.52***
	[0.42]	(0.02)	(0.01)	(0.02)
Allowed to Work	0.87	0.00	-0.16***	-0.18***
	[0.34]	(0.01)	(0.01)	(0.02)
Own Decision to Work	0.55	-0.06***	-0.14***	-0.17***
	[0.50]	(0.02)	(0.01)	(0.03)
Earnings in Past Year	5885.67	1785.65***	-2232.75***	-4234.69***
	[12955.90]	(434.88)	(236.56)	(536.08)
Practice Purdah	0.63	0.05***	0.11***	0.30***
	[0.48]	(0.02)	(0.01)	(0.02)
Can Attend Panchayat Meeting	0.09	0.05***	-0.00	-0.04***
	[0.28]	(0.01)	(0.01)	(0.01)
Can Visit Friend Alone	0.85	-0.06***	-0.07***	-0.10***
	[0.35]	(0.01)	(0.01)	(0.02)
Can Take Public Transport Alone	0.48	-0.02	-0.01	0.00
	[0.50]	(0.02)	(0.01)	(0.02)
Panel B: Food				
Men Eat First	0.31	-0.02	0.02	0.12***
	[0.46]	(0.02)	(0.01)	(0.02)
Alcohol Taboo	0.47	0.04*	0.23***	0.29***
	[0.47]	(0.02)	(0.01)	(0.03)
Meat Taboo	0.13	0.05***	0.26***	0.51***
	[0.34]	(0.01)	(0.01)	(0.02)
Panel C: Marriage				
Widow Remarriage Prohibited	0.32	-0.03**	0.05***	0.18***
	[0.46]	(0.02)	(0.01)	(0.02)
Practice Dowry	0.64	0.13***	0.15***	0.11***
	[0.48]	(0.02)	(0.01)	(0.02)
No Choice in Spouse	0.56	0.02	-0.01	0.11***
	[0.50]	(0.02)	(0.01)	(0.02)
Panel D: Intercaste Relations				
Intercaste Marriage Prohibited	0.74	0.00	0.02*	0.12***
	[0.44]	(0.02)	(0.01)	(0.02)
Practice Untouchability	0.08	-0.04***	0.06***	0.23***
	[0.28]	(0.01)	(0.01)	(0.02)
N				
	1468	1552	8087	752

Notes: The data is obtained from IHDS (2011). The sample includes all caste households in central states: Andhra Pradesh, Chhattisgarh, Gurajat, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, and Telengana. Low rank castes consist of dalits, high rank castes consist of Brahmins and Rajputs, and middle rank castes consist of all other castes. Columns 2-4 report coefficients from a joint regression. Robust standard errors are shown in parentheses. * Significant at the 10 percent level, ** Significant at the 5 percent level, *** Significant at the 1 percent level.

Table 2: Work IHDS

	(1) Ever Worked	(2) Allowed to Work	(3) Own Decision to Work	(4) Earnings in Past Year
Panel A: Pooled				
Adivasi Share	0.220***	0.147***	0.283***	2687.388***
	(0.059)	(0.053)	(0.077)	(672.717)
Mean if Adivasi Share=0	0.46	0.71	0.38	3764.53
	[0.50]	[0.45]	[0.49]	[7887.74]
Panel B: By Caste Rank				
γ_1: Adivasi Share * Middle Rank	0.268***	0.194***	0.342***	3096.969***
	(0.062)	(0.054)	(0.081)	(721.990)
γ_2: Adivasi Share * High Rank	0.045	-0.360*	0.030	-508.798
	(0.140)	(0.214)	(0.185)	(1252.949)
γ_3: Adivasi Share * Low Rank	0.056	0.118	0.069	1715.324
	(0.101)	(0.089)	(0.158)	(1729.018)
P-value from F-Test				
$\gamma_1 = \gamma_2$	0.129	0.011	0.104	0.012
$\gamma_1 = \gamma_3$	0.044	0.389	0.084	0.449
Mean if Adivasi Share=0 and:				
Middle Rank	0.43	0.68	0.36	3321.57
	[0.49]	[0.47]	[0.48]	[7679.22]
High Rank	0.21	0.69	0.38	1417.08
	[0.41]	[0.46]	[0.49]	[5367.77]
Low Rank	0.74	0.87	0.49	7315.65
	[0.44]	[0.34]	[0.50]	[8940.29]
N	8774	8422	7753	8785
PSU	648	648	648	648

Notes: The data is obtained from IHDS (2011) The sample consists of Hindu caste women in central states: Andhra Pradesh, Chhattisgarh, Gurajat, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, and Telengana. Low rank castes consist of dalits, high rank castes consist of Brahmins and Rajputs, and middle rank castes consist of all other castes. All regressions include state fixed effects and control for the distance to the nearest town. Panel B reports separate coefficients for each caste group. Standard errors clustered at the PSU (village) level. * Significant at the 10 percent level, ** Significant at the 5 percent level, *** Significant at the 1 percent level.

Table 3: Purity Norms Indexes

	(1) Practices Purdah	(2) Inverted Decision-Making Index	(3) Inverted Mobility Index	(4) Food Taboo Index	(5) Marriage Restrictions Index	(6) Intercaste Relations Index
Panel A: Pooled						
Adivasi Share	-0.265***	-2.126**	-0.823***	-0.921***	-0.799***	-0.213**
	(0.075)	(0.878)	(0.225)	(0.176)	(0.243)	(0.093)
Panel B: By Caste Rank						
γ_1: Adivasi Share * Middle Rank	-0.275***	-2.223**	-1.033***	-1.070***	-0.915***	-0.225**
	(0.081)	(0.930)	(0.235)	(0.198)	(0.264)	(0.105)
γ_2: Adivasi Share * High Rank	0.115	-0.654	1.402**	-0.179	0.737	-0.024
	(0.080)	(2.772)	(0.619)	(0.691)	(0.487)	(0.200)
γ_3: Adivasi Share * Low Rank	-0.403**	-2.437*	-0.742*	-0.570*	-1.143***	-0.186
	(0.166)	(1.261)	(0.397)	(0.315)	(0.407)	(0.214)
P-value from F-Test						
$\gamma_1 = \gamma_2$	0.001	0.571	0.000	0.210	0.002	0.362
$\gamma_1 = \gamma_3$	0.442	0.873	0.478	0.162	0.592	0.859
N	8782	8779	8784	10391	10391	10391
PSU	648	648	648	648	648	648

Notes: The data is obtained from IHDS (2011). The sample includes all caste households in central states: Andhra Pradesh, Chhattisgarh, Gurajat, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, and Telengana. Low rank castes consist of dalits, high rank castes consist of Brahmins and Rajputs, and middle rank castes consist of all other castes. All regressions include state fixed effects. The outcome in column 1 indicates whether a Hindu caste woman practices purdah (female veiling). See Appendix Tables A3, A4, and A5 for treatment effects on index components. Panel B reports separate coefficients for each caste group. Standard errors are clustered at the PSU (village) level. * Significant at the 10 percent level, ** Significant at the 5 percent level, *** Significant at the 1 percent level.

Table 4: RDD Balance Checks

Panel A: Geographic Characteristics

	(1) Elevation	(2) Slope	(3) Log Flow Accumulation	(4) Rice Suitability	(5) Forest Share
East	4.366	0.445**	0.914	0.344	0.026
	(3.369)	(0.177)	(0.686)	(0.286)	(0.028)
Mean for West of River	178.693	0.589	2.063	1.448	0.042
	[41.582]	[1.106]	[1.408]	[0.455]	[0.069]
N	142	142	142	142	142
Villages	142	142	142	142	142

Panel B: Distribution of Hindu Households by Caste Rank

	(1) High Rank Caste Share	(2) Middle Rank Caste Share	(3) Low Rank Caste Share
East	0.020	-0.084	0.064
	(0.038)	(0.062)	(0.066)
Mean for West of River	0.070	0.515	0.415
	[0.077]	[0.204]	[0.198]
N	141	141	141
Villages	141	141	141

Panel C: Historical Village Characteristics

	(1) 1887 Adivasi Population Share	(2) 1887 Adivasi Land Share	(3) 1887 Village Headman is Adivasi
East	0.001	0.025	-0.030
	(0.046)	(0.054)	(0.062)
Mean for West of River	0.454	0.371	0.154
	[0.250]	[0.246]	[0.364]
Villages	117	113	125

Notes: All regressions are based on a local linear specification estimated separately on each side of the river boundary with a triangular kernel and 20km bandwidth. *Panel A:* The outcomes in columns 1, 2, and 3 come from the Hydroshed database. The outcome in column 4 comes from the Global Agro-Ecological Zoning (GAEZ) models under the assumption of intermediate input usage. The outcome in column 5 comes from the 2011 population census. *Panel B:* Columns 1 through 3 denote the share of the village Hindu population that belongs to the denoted caste rank group. High rank castes are Brahmin and Rajput; low rank castes are Dalits; middle rank includes all other castes. Caste share outcomes from the 2011 SECC; caste is coded based on individuals' last name and validated based on in-person survey checks. *Panel C:* All outcomes from 1887 land records. *All Panels:* Standard errors clustered at the village level. * Significant at the 10 percent level, ** Significant at the 5 percent level, *** Significant at the 1 percent level.

Table 5: First Stage, Work Outcomes, and Beliefs

	Census Data		Survey Data					
			FLFP		Own Beliefs		Community Beliefs	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Adivasi Share	Occupation: Worker	Occupation: Worker	Wife Worked Outside	Believe Work Appropriate	Aspiration: Housewife DIL	Caste Believes Work Appropriate	Caste Prefers Housewife DIL
East	0.248***	0.098*	0.143**	0.375***	0.092	-0.199***	0.111*	-0.166**
	(0.065)	(0.052)	(0.072)	(0.082)	(0.068)	(0.075)	(0.059)	(0.078)
Mean for West of River	0.250	0.205	0.336	0.374	0.739	0.571	0.638	0.630
	[0.178]	[0.404]	[0.473]	[0.484]	[0.440]	[0.495]	[0.481]	[0.483]
N	142	26,283	856	856	813	798	861	773
Villages	142	141	142	142	142	142	142	142

Notes: All regressions are based on a local linear specification estimated separately on each side of the river boundary with a triangular kernel and 20km bandwidth. Column 1 uses village-level data from the 2011 population census. Column 2 uses individual-level data on caste women aged 25-64 years from the 2011 Socio-Economic and Caste Census and controls for age, marital status, and whether the household is classified as scheduled caste. Columns 3-8 use our own survey data with Hindu caste men and controls for age, enumerator fixed effects, and survey time fixed effects. The outcome in column 1 is the share of individuals who are classified as scheduled tribes in the village. The outcome in column 2 indicates whether the Hindu woman worked based on the classification of a free-text occupation question (not including work on own farm). The outcome in column 3 is an indicator variable that is equal to one if the primary occupation of the respondent's wife is not housewife. The outcome in column 4 indicates whether the respondent's wife did one of the following activities at least once in the past year: agricultural work for pay on someone else's land, self-employment, non-agricultural daily labor, or salaried work. The outcome in column 5 indicates whether the respondent believes that it is appropriate for a Hindu woman to work outside, even if not financially constrained. The outcome in column 6 indicates whether the respondent replied ' wife who wants to work for pay' to the following vignette: 'assume you had a son of marriageable age and you could choose between two wives for your son. Both wives are from your jati and have the same education and same financial status. However, only one of them wants to work outside for pay. Which wife would you prefer for your son?'. The outcomes in columns 7-8 are equivalent to the outcomes in columns 5-6, but instead of asking about the respondent's own beliefs, we ask the respondent about what other households in the village believe. Appendix Figure A3 shows results for different bandwidths and Appendix Figure A4 shows results for optimal bandwidths, different kernels, second-order RD polynomials, and geographic controls. Appendix Table A9 reports Conley standard errors that adjust for spatial correlation and Appendix Table A10 reports p-values based on randomization inference. Standard errors clustered at the village level. * Significant at the 10 percent level, ** Significant at the 5 percent level, *** Significant at the 1 percent level.

Table 6: Intercaste Purity Norms and Food Taboos

	Untouchability			Food Taboo
	(1) Practice Adivasi Untouchability	(2) Practice Dalit Untouchability	(3) Adivasi Ranks $\geq$ Middle Caste in Hierarchy	(4) No Meat Household
East	-0.298***	-0.081**	0.118**	-0.186**
	(0.110)	(0.040)	(0.052)	(0.091)
Mean for West of River	0.643	0.959	0.061	0.616
	[0.480]	[0.199]	[0.240]	[0.487]
N	835	361	375	848
Villages	143	143	143	143

Notes: East of River corresponds to higher Adivasi population share. All regressions are based on a local linear specification estimated separately on each side of the river boundary with a triangular kernel and 20km bandwidth. Column 1 pools data from our own survey data with village elders and with Hindu caste men. Columns 2-3 use our own survey data with village elders. Colum 5 uses our own survey data with Hindu caste men and controls for age, enumerator fixed effects, and survey time fixed effects. The outcome in column 1 indicates whether the respondent accepts water from at least one Adivasi group in the village. The outcome in column 2 indicates whether the respondent accepts water from Dalits in the village. The outcome in column 3 indicates whether there is at least one Adivasi group in the village that ranks at least as high as the lowest middle (OBC) caste group in the village. The outcome in column 4 indicates whether the respondent's wife eats chicken. Appendix Figure A3 shows results for different bandwidths and Appendix Figure A4 shows results for optimal bandwidths, different kernels, second-order RD polynomials, and geographic controls. Appendix Table A9 reports Conley standard errors that adjust for spatial correlation and Appendix Table A10 reports p-values based on randomization inference. Standard errors clustered at the village level. * Significant at the 10 percent level, ** Significant at the 5 percent level, *** Significant at the 1 percent level.

Table 7: Social Interactions

	(1) Total Friends	(2) Any Socialize	(3) Any Advice	(4) Any Financial Assistance	(5) Any Manpower Assistance
Panel A: Own Caste					
East	-0.106	-0.026	-0.072	0.048	-0.026
	(0.376)	(0.039)	(0.050)	(0.079)	(0.046)
Mean for West of River	2.756	0.963	0.942	0.455	0.963
	[1.879]	[0.189]	[0.235]	[0.499]	[0.189]
Panel B: Adivasi					
East	0.829***	0.360***	0.363***	0.152***	0.361***
	(0.236)	(0.117)	(0.105)	(0.058)	(0.116)
Mean for West of River	0.602	0.366	0.255	0.064	0.342
	[0.860]	[0.482]	[0.436]	[0.244]	[0.475]
Panel C: Upper or Other Middle Castes					
East	-0.557**	-0.388***	-0.362***	-0.116	-0.385***
	(0.273)	(0.113)	(0.110)	(0.073)	(0.101)
Mean for West of River	1.432	0.557	0.493	0.146	0.576
	[1.192]	[0.497]	[0.501]	[0.353]	[0.495]
N	712	712	712	712	712
Villages	143	143	143	143	143

Notes: East of River corresponds to higher Adivasi population share. All regressions are based on a local linear specification estimated separatey on each side of the river boundary with a triangular kernel and 20km bandwidth. All columns use our own survey data with Hindu caste men and controls for age, enumerator fixed effects, and survey time fixed effects. The outcomes are obtained from a social network exercise based on the following questions: 'How many families are there in this village whose house you visit frequently or with whom you socialize frequently?', 'How many families are there in this village who give you important advice, such as advice on farming, health, or financial issues?', 'In your village, how many families are there who you could borrow from without interest in case of a medical emergency?', and 'If you needed manpower assistance such as, for instance, if there was a wedding in your household, from how many families in this village could you ask for unpaid assistance?'. For each person listed in the module, we then elicited the name and caste of the person. Column 1 reports the total number of unique friends. The outcomes in columns 2-4 indicate whether the respondent has at least one friend in the respective categories. Panel A restricts the responses to friends from the respondent's own caste. Panel B restricts the responses to Adivasi friends. Panel C restricts the responses to friends other upper and middle rank castes. Standard errors clustered at the village level. * Significant at the 10 percent level, ** Significant at the 5 percent level, *** Significant at the 1 percent level.

Table 8: Balance Check: Comparison of Villages Where Adivasis Historically Practiced Plough vs. Non-Plough Agriculture

	Distance to Nearest Town (1)	Distance to District HQ (2)	Any Private Primary School (3)	No Drainage System (4)	Share HHs Open Defecate (5)	Share HHs Electricity (6)	Share HHs Mobile Phone (7)
Traditionally Non-Plough Adivasi Share	4.493 (4.948)	8.954 (13.054)	-0.565*** (0.189)	0.071 (0.200)	-0.037 (0.097)	-0.135* (0.081)	0.018 (0.167)
Traditionally Plough Adivasi Share	0.223 (8.949)	7.616 (23.706)	-0.226 (0.370)	0.082 (0.359)	0.124 (0.134)	-0.170 (0.126)	-0.301 (0.206)
p-value: Trad. Non-Plough Adivasi Share = Trad. Plough Adivasi Share	0.618	0.953	0.346	0.978	0.358	0.823	0.307
Outcome Mean for Adivasi Share = 0	14.938	51.124	0.403	0.496	0.812	0.781	1.311
Observations	198	198	198	198	198	198	198

Notes: Sample includes all villages in central states: Orissa, Madhya Pradesh, Chhattisgarh, Jharkhand, Maharashtra, Gujarat, Rajasthan, Andhra Pradesh, Telengana. All regressions include state fixed effects and standard errors clustered at PSU (village) level.

Table 9: Impacts of Historical Adivasi Agricultural Practices on Current Gender Norms

Panel A: Impacts on Adivasi Women

	Ever Worked	(Inverted) Seclusion Index	(Inverted) Marriage Restrictions Index
	(1)	(2)	(3)
Woman is Traditionally Non-Plough Adivasi	0.107**	0.317**	0.304*
	(0.045)	(0.157)	(0.158)
Outcome Mean for Traditionally Plough Adivasi	0.802	0.247	-0.017
N	483	483	483
Villages	82	82	82

Panel B: Impacts on Hindu Women

	Ever Worked	(Inverted) Seclusion Index	(Inverted) Marriage Restrictions Index	HH Earnings from Agricultural Labor (asinh)
	(1)	(2)	(3)	(4)
Traditionally Non-Plough Adivasi Share	0.562***	0.828***	0.790***	3.904***
	(0.083)	(0.202)	(0.144)	(0.835)
Traditionally Plough Adivasi Share	0.175	0.295	-0.154	0.207
	(0.209)	(0.304)	(0.405)	(1.748)
p-value: Trad. Non-Plough Adivasi Share = Trad. Plough Adivasi Share	0.064	0.130	0.032	0.049
Outcome Mean for Adivasi Share = 0	0.495	-0.001	0.002	3.504
N	1,835	1,836	1,836	1,658
Villages	197	198	198	197

Notes: Standard errors clustered at the village level. * Significant at the 10 percent level, ** Significant at the 5 percent level, *** Significant at the 1 percent level.

A. Appendix Tables and Figures

Figure A1: IHDS Distribution of Adivasi Share
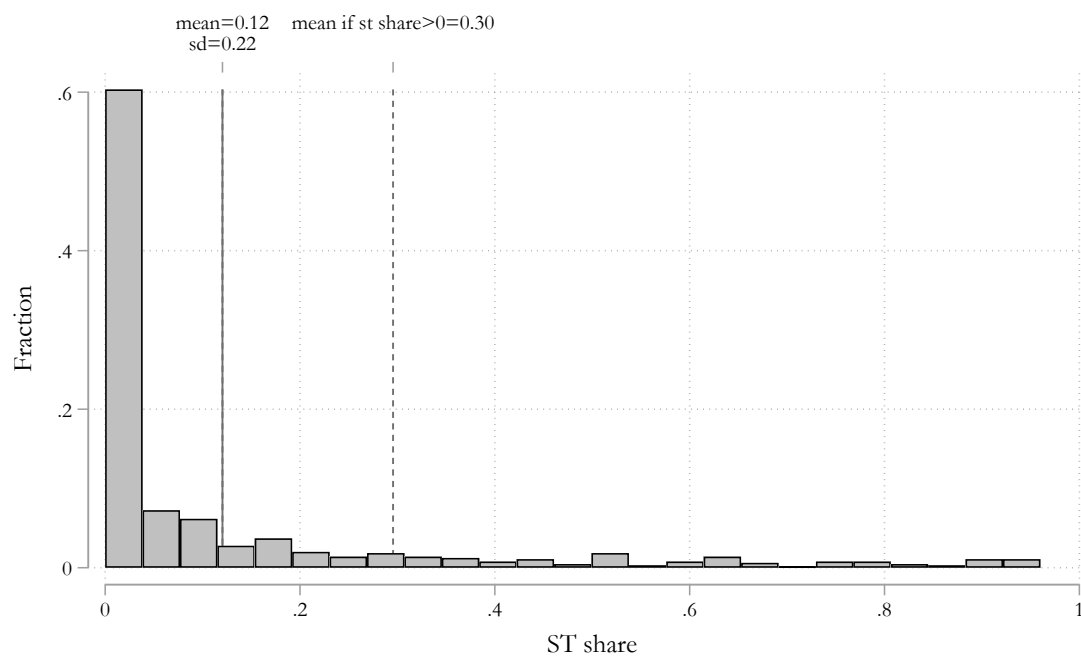
Notes: Figure constructed using data from IHDS (2011). The sample includes all caste households in central states: Andhra Pradesh, Chhattisgarh, Gurajat, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, and Telengana.

Figure A2: Non-Plough and Plough Adivasi Share Effects on Caste Women's Work

Sample: Caste Women in Central States

Figure A3: Robustness to RD Bandwidth
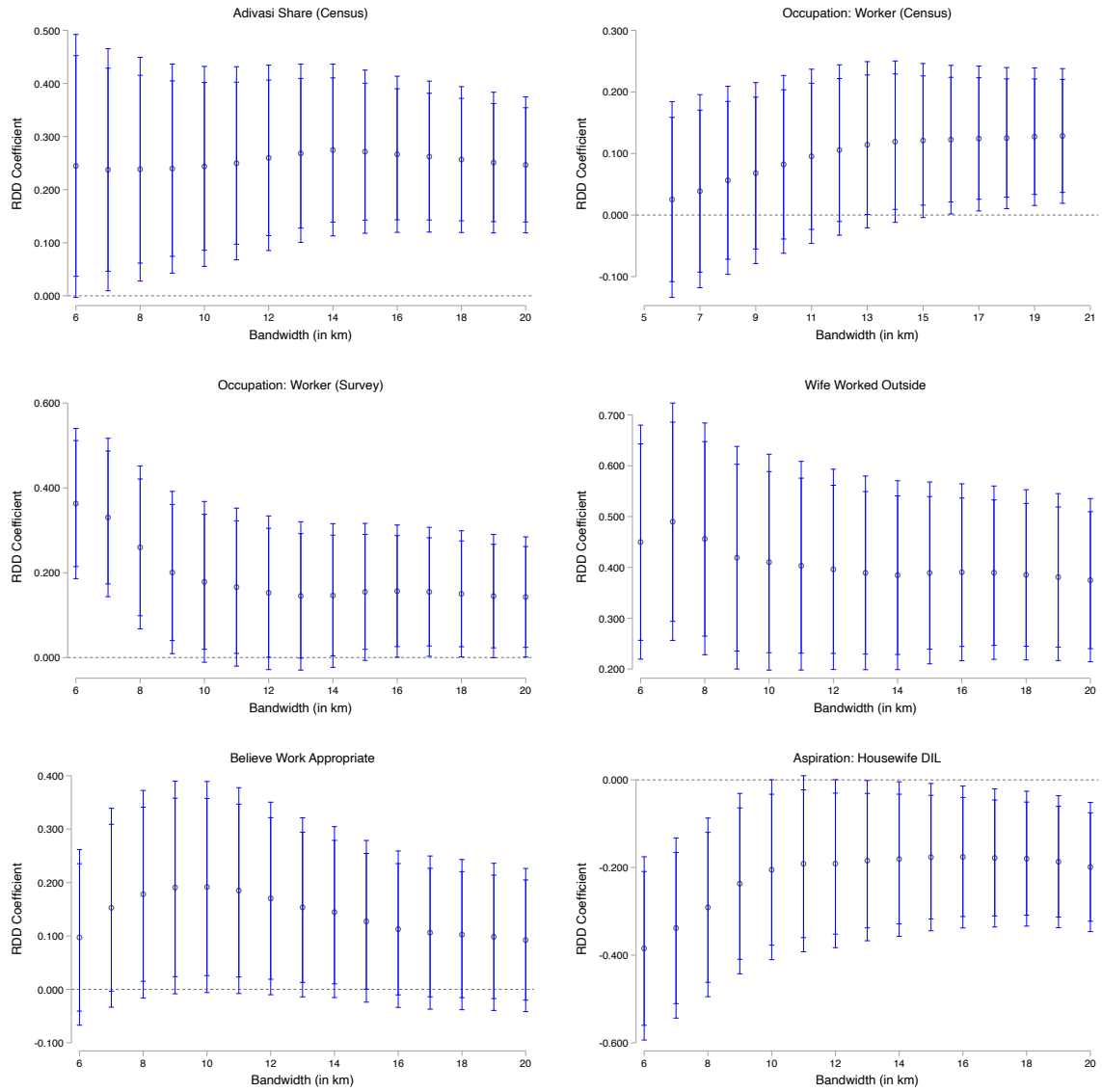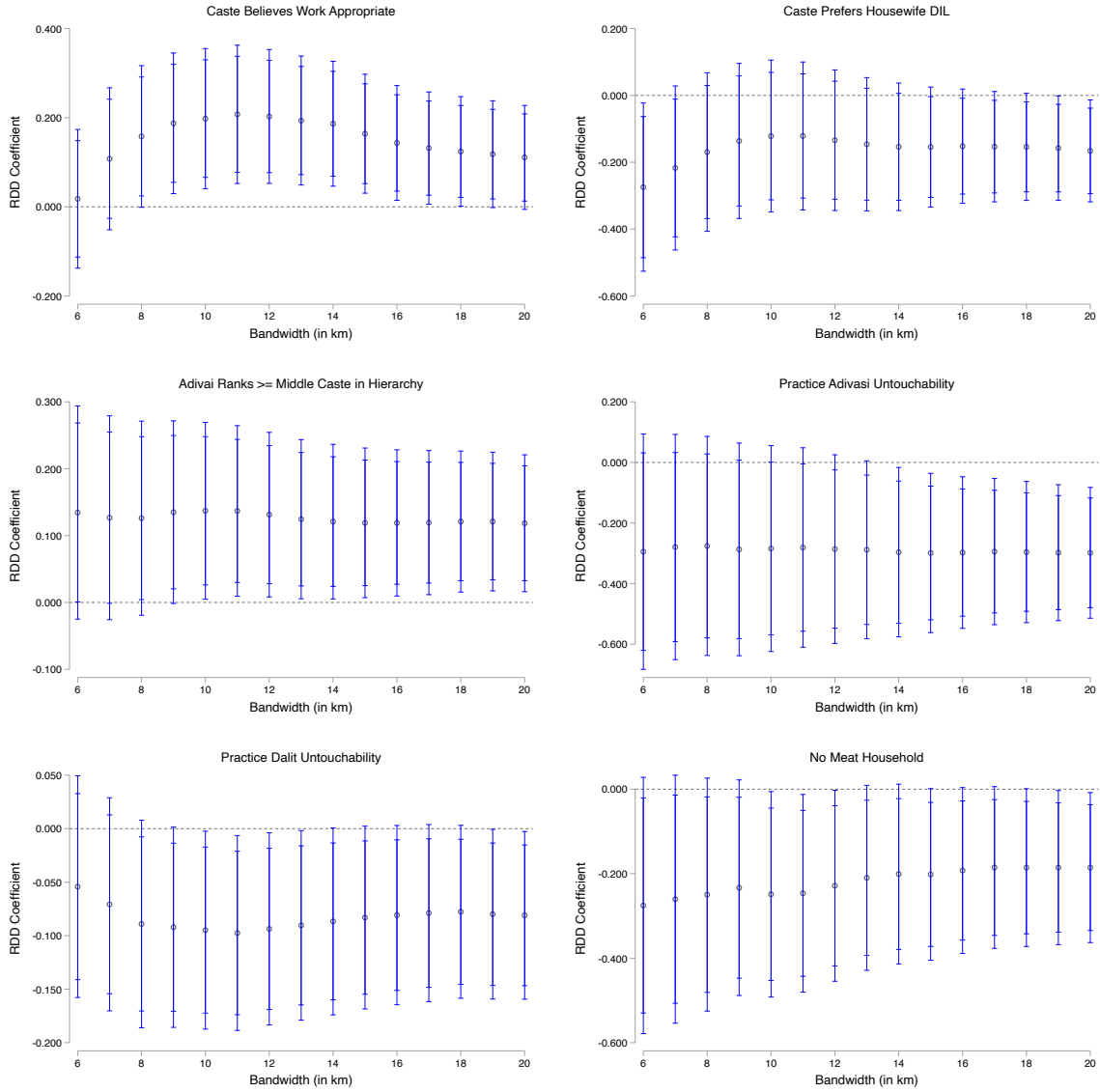
Notes: The figures show the RD coefficients for our main outcomes across different bandwidth definitions. The local linear trends are estimated separately on each side of the river using a triangular kernel. Standard errors are clustered at the village level. The range plots correspond to 90 and 95 percent confidence intervals. The first figure shows village-level Adivasi share based on the 2011 population census. The second figure shows female labor force participation rates based on individual-level data from the Government of India's 2011 Socio-Economic and Caste Census. The remaining outcomes are obtained from our own surveys with Hindu caste men and village elders. See Tables 5 and 6 for outcome definitions.

Figure A4: Additional Robustness Checks
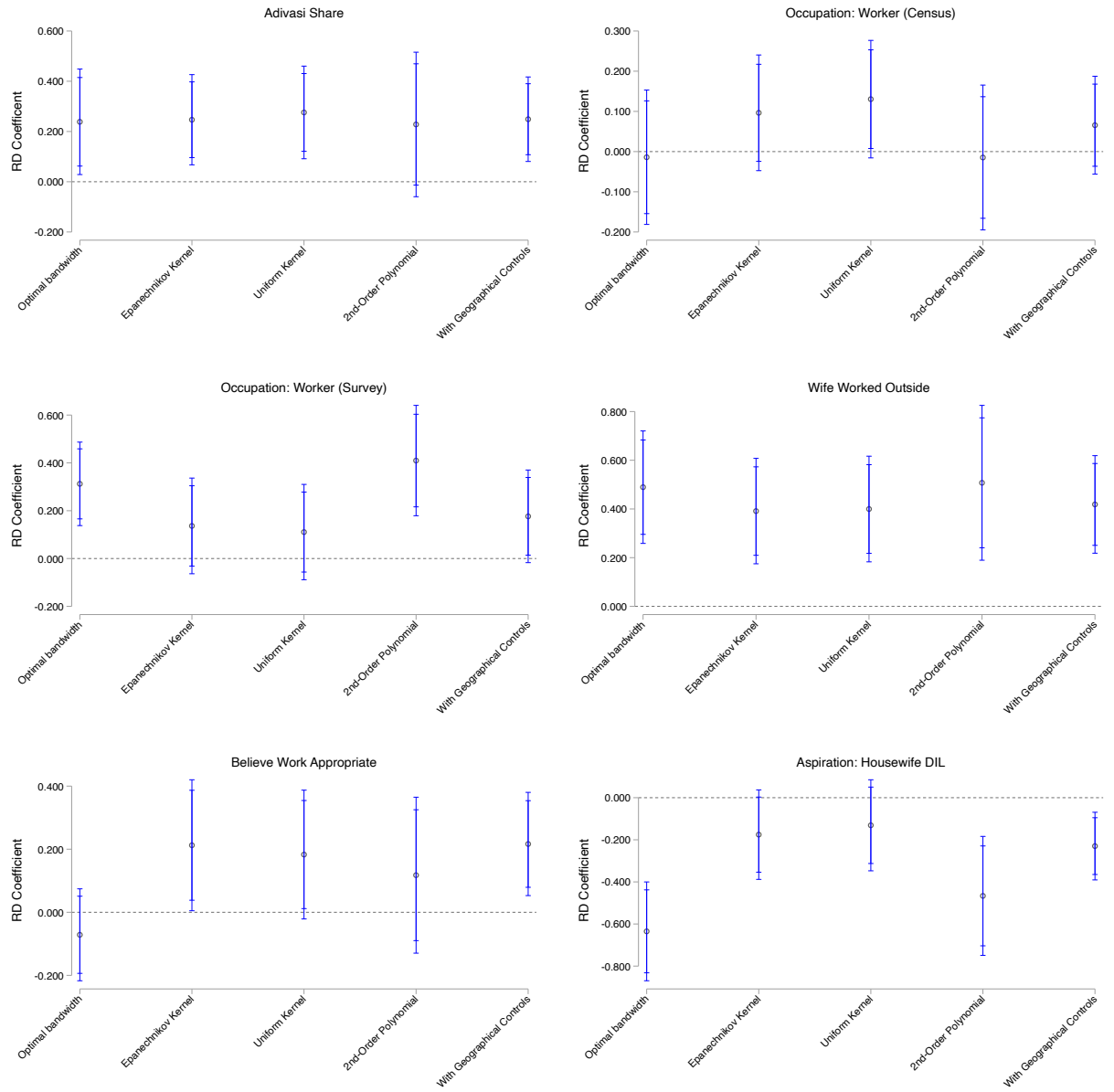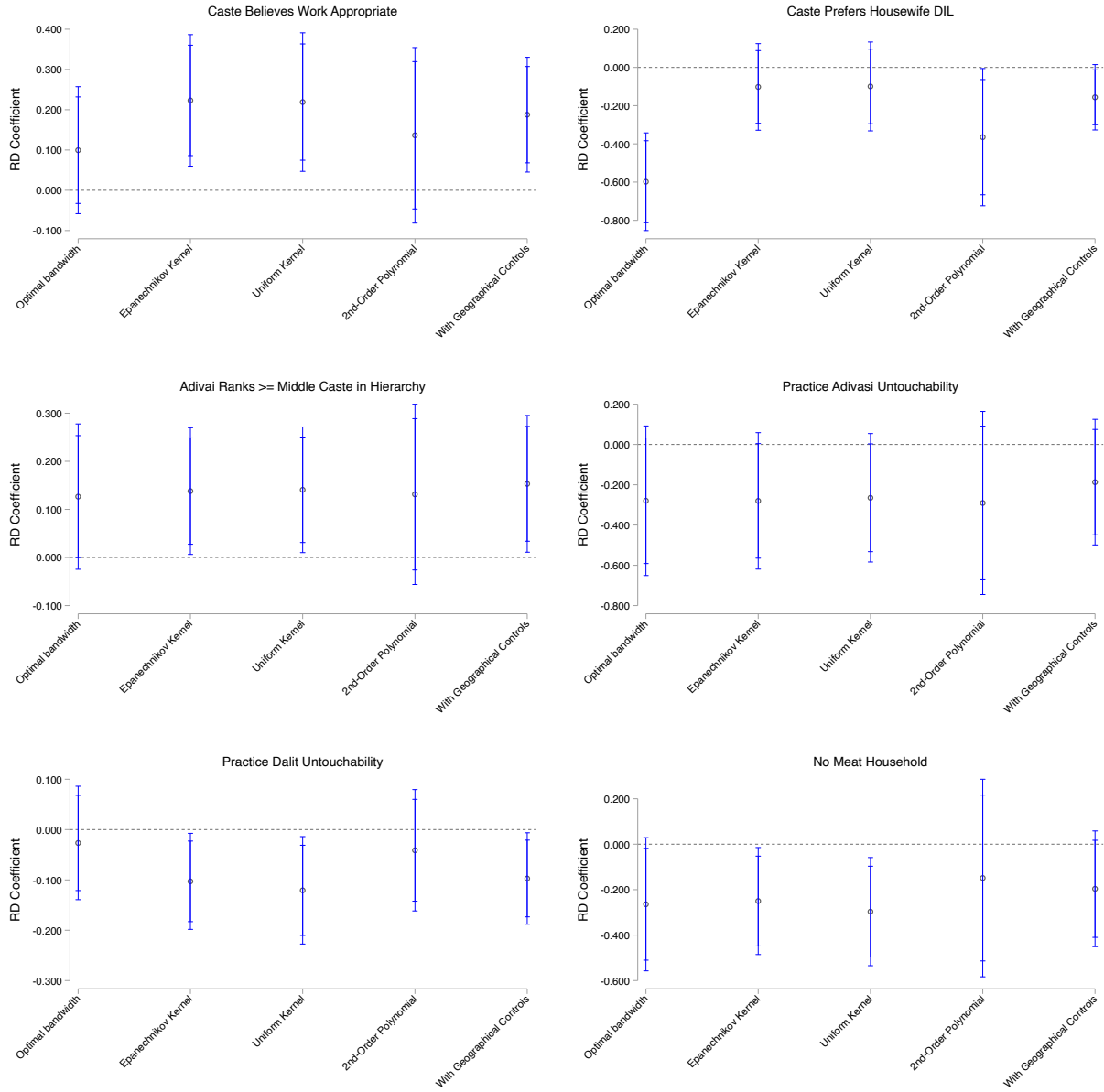
Notes: The figures show the RD coefficients for our main outcomes across different specifications. The first coefficients come from regressions using mean-squared-error optimal bandwidths (Calonico et al., 2020). The second and third coefficients come from regressions that use epanechnikov and uniform kernels respectively. The fourth coefficients come from regressions that use 2nd-order RD polynomials. The fifth coefficients come from regressions that include the geographic controls listed in Appendix Table 4. The range plots correspond to 90 and 95 percent confidence intervals. The first figure shows village-level Adivasi share based on the 2011 population census. The second figure shows female labor force participation rates based on individual-level data from the Government of India's 2011 Socio-Economic and Caste Census. The remaining outcomes are obtained from our own surveys with Hindu caste men and village elders. See Tables 5 and 6 for outcome definitions.

Table A1: Village Differences by Adivasi Share

	(1) Advasi Share = 0 Mean	(2) Adivasi Share Coefficient
Panel A: Population Numbers and Distribution		
Number of Households	547.53	-190.49***
	[590.47]	(69.17)
Dalit Share	0.16	0.06
	[0.20]	(0.04)
Middle Status Caste Share	0.77	-0.03
	[0.23]	(0.05)
High Status Caste Share	0.08	-0.03
	[0.15]	(0.03)
Panel B: Remoteness		
Distance to Nearest Town	13.94	4.99***
	[9.71]	(1.50)
Distance to District HQ	51.09	16.82***
	[30.34]	(4.33)
Panel C: Village Infrastructure		
Share HHs Electricity	0.77	-0.10***
	[0.27]	(0.03)
Share HHs Mobile Phone	0.83	-0.28***
	[0.17]	(0.03)
Share HHs Open Defecate	0.66	0.17***
	[0.30]	(0.04)
Has Drainage System	0.68	-0.07
	[0.47]	(0.06)
Village Has Paved Road	0.87	-0.19***
	[0.34]	(0.05)
Villages	380	683

Notes: Sample includes villages in central states: Orissa, Madhya Pradesh, Chhattisgarh, Jharkhand, Maharashtra, Gujarat, Rajasthan, Andhra Pradesh, West Bengal. All regressions include state fixed effects and standard errors clustered at PSU (village) level.

	(1) Female Share Unreserved Local Politicians	(2) Hindu Female Share Unreserved Local Politicians	(3) Discusses Politics with Husband
Panel A: Pooled			
Adivasi Share	0.075*	0.115*	0.110*
	(0.041)	(0.061)	(0.059)
Mean if Adivasi Share=0	0.12	0.12	0.70
	[0.17]	[0.17]	[0.46]
Panel B: By Caste Rank			
γ_1: Adivasi Share * Middle Rank			0.120*
			(0.063)
γ_2: Adivasi Share * High Rank			-0.221
			(0.168)
γ_3: Adivasi Share * Low Rank			0.219*
			(0.129)
P-value from F-Test			
$\gamma_1 = \gamma_2$			0.049
$\gamma_1 = \gamma_3$			0.448
Mean if Adivasi Share=0 and:			
Middle Rank			0.68
			[0.47]
High Rank			0.71
			[0.45]
Low Rank			0.72
			[0.45]
N	504	504	8489
PSU	504	504	648

Notes: The data is obtained from IHDS (2011). The sample includes household and village surveys in central states: Andhra Pradesh, Chhattisgarh, Gurajat, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, and Telengana. Low rank castes consist of dalits, high rank castes consist of Brahmins and Rajputs, and middle rank castes consist of all other castes. All regressions include state fixed effects and control for the distance to the nearest town. The village-level outcome in column 1 is the share of women among elected village representatives, restricted to seats that have not been reserved for quotas for women or underrepresented groups (scheduled castes and scheduled tribes/Adivasi) in the most recent election. The outcome in column 2 replicates the variable in column 1 but restricts the sample to Hindu village representatives. The individual-level outcome in column 3 indicates whether a Hindu caste woman responds that she discusses politics with her husband at least sometimes. Panel B reports separate coefficients for each caste group. Standard errors clustered at the PSU (village) level. * Significant at the 10 percent level, ** Significant at the 5 percent level, *** Significant at the 1 percent level.

Table A3: Mobility Index Components IHDS

	(1) Cannot Attend Panchayat Meeting	(2) Cannot Travel Alone to Friend House	(3) Cannot Take Public Transport Alone
Panel A: Pooled			
Adivasi Share	-0.077**	-0.112**	-0.147**
	(0.031)	(0.046)	(0.066)
Mean if Adivasi Share=0	0.91	0.24	0.54
	[0.29]	[0.43]	[0.50]
Panel B: By Caste Rank			
γ_1: Adivasi Share * Middle Rank	-0.088**	-0.160***	-0.179***
	(0.035)	(0.048)	(0.067)
γ_2: Adivasi Share * High Rank	-0.105	0.292*	0.550***
	(0.091)	(0.165)	(0.140)
γ_3: Adivasi Share * Low Rank	-0.002	-0.045	-0.309**
	(0.054)	(0.077)	(0.131)
P-value from F-Test			
$\gamma_1 = \gamma_2$	0.855	0.007	0.000
$\gamma_1 = \gamma_3$	0.166	0.177	0.335
Mean if Adivasi Share=0 and:			
Middle Rank	0.91	0.25	0.55
	[0.28]	[0.43]	[0.50]
High Rank	0.96	0.25	0.51
	[0.20]	[0.43]	[0.50]
Low Rank	0.86	0.21	0.54
	[0.35]	[0.41]	[0.50]
N	8776	8687	8729
PSU	648	648	648

Notes: Sample includes all caste households in central states: Orissa, Madhya Pradesh, Chhattisgarh, Jharkhand, Maharashtra, Gujarat, Rajasthan, Andhra Pradesh, West Bengal. All regressions include state fixed effects and standard errors clustered at PSU (village) level.

Table A4: Marriage and Intercaste Relations Restrictions Components IHDS

	(1) Widow Remarriage Prohibited	(2) Practice Dowry	(3) No Choice in Spouse	(4) Intercaste Marriage Prohibited	(5) Practice Untouchability
Panel A: Pooled					
Adivasi Share	-0.181**	-0.065	-0.142**	-0.036	-0.098*
	(0.077)	(0.053)	(0.063)	(0.053)	(0.052)
Mean if Adivasi Share=0	0.37	0.78	0.57	0.77	0.14
	[0.48]	[0.41]	[0.49]	[0.42]	[0.35]
Panel B: By Caste Rank					
γ_1: Adivasi Share * Middle Rank	-0.207***	-0.094*	-0.147**	-0.033	-0.101*
	(0.077)	(0.056)	(0.069)	(0.055)	(0.061)
γ_2: Adivasi Share * High Rank	0.419**	0.080	-0.298**	0.257**	-0.074
	(0.196)	(0.172)	(0.148)	(0.131)	(0.226)
γ_3: Adivasi Share * Low Rank	-0.370***	0.023	-0.038	-0.197	-0.065
	(0.098)	(0.117)	(0.103)	(0.125)	(0.069)
P-value from F-Test					
$\gamma_1 = \gamma_2$	0.002	0.326	0.344	0.038	0.909
$\gamma_1 = \gamma_3$	0.102	0.305	0.313	0.190	0.668
Mean if Adivasi Share=0 and:					
Middle Rank	0.38	0.80	0.56	0.76	0.15
	[0.49]	[0.40]	[0.50]	[0.43]	[0.36]
High Rank	0.47	0.71	0.73	0.83	0.33
	[0.50]	[0.45]	[0.44]	[0.38]	[0.47]
Low Rank	0.29	0.74	0.59	0.78	0.05
	[0.45]	[0.44]	[0.49]	[0.42]	[0.22]
N	9150	9241	8780	8884	6350
PSU	648	648	648	648	648

Notes: Sample includes all caste households in central states: Orissa, Madhya Pradesh, Chhattisgarh, Jharkhand, Maharashtra, Gujarat, Rajasthan, Andhra Pradesh, West Bengal. All regressions include state fixed effects and standard errors clustered at PSU (village) level.

Table A5: Food Taboos Compoenents IHDS

	(1) Meat Taboo	(2) Alcohol Taboo	(3) Men Eat First
Panel A: Pooled			
Adivasi Share	-0.177***	-0.135**	-0.214***
	(0.052)	(0.052)	(0.061)
Mean if Adivasi Share=0	0.39	0.67	0.35
	[0.49]	[0.45]	[0.48]
Panel B: By Caste Rank			
γ_1: Adivasi Share * Middle Rank	-0.236***	-0.141**	-0.217***
	(0.060)	(0.058)	(0.065)
γ_2: Adivasi Share * High Rank	0.018	0.127	-0.170
	(0.220)	(0.143)	(0.180)
γ_3: Adivasi Share * Low Rank	0.041	-0.225**	-0.222
	(0.089)	(0.104)	(0.147)
P-value from F-Test			
$\gamma_1 = \gamma_2$	0.265	0.083	0.803
$\gamma_1 = \gamma_3$	0.007	0.453	0.974
Mean if Adivasi Share=0 and:			
Middle Rank	0.41	0.71	0.35
	[0.49]	[0.44]	[0.48]
High Rank	0.63	0.73	0.48
	[0.48]	[0.43]	[0.50]
Low Rank	0.20	0.48	0.31
	[0.40]	[0.48]	[0.46]
N	9258	5544	8768
PSU	648	648	648

Notes: Sample includes all caste households in central states: Orissa, Madhya Pradesh, Chhattisgarh, Jharkhand, Maharashtra, Gujarat, Rajasthan, Andhra Pradesh, West Bengal. All regressions include state fixed effects and standard errors clustered at PSU (village) level.

Table A6: Work IHDS with Village Fixed Effects

	Ever Worked	Allowed to Work	Own Decision to Work	Earnings in Past Year
γ_1: Adivasi Share * Middle Rank	0.108	0.210**	0.192*	996.878
	(0.115)	(0.106)	(0.112)	(2067.342)
N	8763	8408	7732	8774
PSU	648	648	648	648

Notes: Sample includes all caste households in central states: Orissa, Madhya Pradesh, Chhattisgarh, Jharkhand, Maharashtra, Gujarat, Rajasthan, Andhra Pradesh, West Bengal. All regressions include PSU (village) fixed effects.

Table A7: Purity Norms Indexes with Village Fixed Effects

	Practices Purdah	Inverted Decision-Making Index	Inverted Mobility Index	Food Taboo Index	Marriage Restrictions Index	Intercaste Relations Index
γ_1: Adivasi Share * Middle Rank	-0.058	-0.256	-0.640	-0.844**	-0.099	-0.264
	(0.076)	(1.272)	(0.473)	(0.339)	(0.401)	(0.164)
N	8771	8768	8773	8774	8774	8774
PSU	648	648	648	648	648	648

Notes: Sample includes all caste households in central states: Orissa, Madhya Pradesh, Chhattisgarh, Jharkhand, Maharashtra, Gujarat, Rajasthan, Andhra Pradesh, West Bengal. All regressions include PSU (village) fixed effects.

Table A8: Impact of Plough and Non-Plough Adivasis

	Worked (1)
Panel A: Adivasi Woman Worked	
Woman is Traditionally Non-Plough Adivasi	0.115***
	(0.036)
Outcome Mean for Traditionally Plough Adivasi	0.372
Village Controls	Yes
State FEs	Yes
Observations	4,954
Panel B: Caste Woman Worked	
Traditionally Non-Plough Adivasi Share	0.292***
	(0.068)
Traditionally Plough Adivasi Share	-0.033
	(0.079)
p-value: Trad. Non-Plough Adivasi Share = Trad. Plough Adivasi Share	0.000
Outcome Mean for Adivasi Share < 0.1	0.298
Village Controls	Yes
State FEs	Yes
Observations	2,449

Notes: Sample includes all caste households in central states: Orissa, Madhya Pradesh, Chhattisgarh, Jharkhand, Maharashtra, Gujarat, Rajasthan, Andhra Pradesh, Telengana. All regressions include state fixed effects and standard errors clustered at PSU (village) level.

Table A9: RDD Results with Conley Standard Errors

Variable	Estimate	S.E.	p-value
Adivasi Share	0.074	(0.074)	0.074
Occupation: Worker (Census)	0.042	(0.042)	0.042
Occupation: Worker (Survey)	0.054	(0.054)	0.054
Wife Worked Outside	0.064	(0.064)	0.064
Believe Work Appropriate	0.045	(0.045)	0.045
Aspiration: Housewife DIL	0.073	(0.073)	0.073
Caste Believes Work Appropriate	0.048	(0.048)	0.048
Caste Prefers Housewife DIL	0.082	(0.082)	0.082
No Meat Household	0.081	(0.081)	0.081
Adivai Ranks >= Middle Caste in Hierarchy	0.046	(0.046)	0.046
Practice Dalit Untouchability	0.030	(0.030)	0.030
Practice Adivasi Untouchability	0.084	(0.084)	0.084

Notes: All regressions are based on a local linear specification estimated separately on each side of the river boundary with a uniform kernel and 20km bandwidth. The table reports Conley standard errors with a cut-off window of 10 kilometeres to account for spatial auto-correlation (Conley, 1999).

Table A10: Randomization Inference

Variable	p-value
Adivasi Share	0.002
Occupation: Worker (Census)	0.016
Occupation: Worker (Survey)	0.098
Wife Worked Outside	0.001
Believe Work Appropriate	0.258
Aspiration: Housewife DIL	0.020
Caste Believes Work Appropriate	0.127
Caste Prefers Housewife DIL	0.056
No Meat Household	0.056
Adivasi Ranks >= Middle Caste in Hierarchy	0.084
Practice Dalit Untouchability	0.146
Practice Adivasi Untouchability	0.009

Notes: All regressions are based on a local linear specification estimated separately on each side of the river boundary with a triangular kernel and 20km bandwidth. The exercise randomly re-assigns the distance to the river for each sample village 1,000 times. For each iteration, we then repeat our analysis based on the re-assigned indicator for whether the village is located on the east side of the river. The p-value is calculated as the share of the placebo coefficients that are larger in magnitude than the actual coefficient on the east side dummy (in absolute terms).

Table A11: Alternative Labor Demand and Supply Explanations

	Labor Demand			Labor Supply			
	(1) Hire Women	(2) Price Received Rice (Rs./Kg)	(3) Rice Output Per Acre (Kg)	(4) Women's Daily Wage (Rs.)	(5) Know Current Wage	(6) Know of Agri Labor Opportunities	(7) Childcare Available
East	-0.115	-0.945	260.147**	-54.276***	0.018	-0.064	-0.073
	(0.070)	(0.778)	(131.107)	(14.184)	(0.027)	(0.045)	(0.061)
Mean for West of River	0.848	17.021	1572.402	279.176	0.964	0.953	0.607
	[0.360]	[3.033]	[652.842]	[44.658]	[0.188]	[0.212]	[0.489]
N	532	307	507	357	373	331	855
Villages	143	143	143	143	143	143	143

Notes: All regressions are based on a local linear specification estimated separately on each side of the river boundary with a triangular kernel and 20km bandwidth. Outcomes come from our own survey data with Hindu caste men and controls for age, enumerator fixed effects, and survey time fixed effects. Standard errors clustered at the village level. * Significant at the 10 percent level, ** Significant at the 5 percent level, *** Significant at the 1 percent level.

Table A12: Geographic Balance Checks for Watchmen Analysis

	(1) Adivasi Share	(2) Elevation	(3) Slope	(4) Log Flow Accumulation	(5) Rice Suitability	(6) Forest Share
Watchman Block	0.009 (0.015)	18.854*** (1.566)	-0.040 (0.030)	-0.040 (0.232)	0.006 (0.019)	-0.009 (0.008)
Mean for Not Watchman Block	0.159 [0.150]	148.004 [12.977]	0.312 [0.302]	2.777 [2.363]	1.294 [0.208]	0.037 [0.086]
Villages	443	443	443	443	443	443

Notes: The outcomes in columns 2 and 4 come from the Hydroshed database. The outcome in column 3 comes from the SHRUG database (Asher et al., 2021). The outcome in column 5 comes from the Global Agro-Ecological Zoning (GAEZ) models under the assumption of intermediate input usage. The outcomes in columns 1 and 5 come from the 2011 Population Census. Standard errors clustered at the village level. * Significant at the 10 percent level, ** Significant at the 5 percent level, *** Significant at the 1 percent level.

Table A13: Purity Norms Using Watchman Block Assignment

	(1) Village Has Adivasi Jhankar	(2) Adivasi Priest Own Wedding	(3) Practice Untouchability	(4) Believe Work Appropriate	(5) No Meat Household
Watchman Block	0.179***	0.169***	-0.072***	0.044*	-0.104***
	(0.036)	(0.026)	(0.017)	(0.025)	(0.030)
Mean for Not Watchman Block	0.525	0.690	0.870	0.662	0.649
	[0.500]	[0.463]	[0.336]	[0.473]	[0.477]
N	1,780	1,780	1,780	1,780	1,780
Villages	791	791	791	791	791

Notes: The outcomes are obtained from phone surveys with elected village representatives. Standard errors clustered at the village level. * Significant at the 10 percent level, ** Significant at the 5 percent level, *** Significant at the 1 percent level.

Table A14: Effect of Density on Hindus

	(1) Mean	(2) Population Density
Panel A: Seclusion		
Ever Worked	0.493	-0.011
	[0.500]	(0.008)
Allowed to Work	0.735	0.004
	[0.441]	(0.012)
Own Decision to Work	0.421	-0.012
	[0.494]	(0.011)
Practice Purdah	0.741	-0.021**
	[0.438]	(0.010)
Can Attend Panchayat Meeting	0.091	0.001
	[0.287]	(0.004)
Can Visit Health Center Alone	0.640	-0.005
	[0.480]	(0.008)
Can Visit Friend Alone	0.780	-0.015**
	[0.414]	(0.007)
Can Take Public Transport Alone	0.475	-0.009
	[0.499]	(0.008)
Panel B: Food		
Men Eat First	0.335	0.012
	[0.472]	(0.011)
Alcohol Taboo	0.670	0.010
	[0.454]	(0.010)
Meat Taboo	0.375	0.003
	[0.484]	(0.006)
Panel C: Marriage		
Widow Remarriage Prohibited	0.360	0.006
	[0.480]	(0.011)
Practice Dowry	0.777	0.002
	[0.416]	(0.007)
No Choice in Spouse	0.558	-0.037***
	[0.497]	(0.008)
Panel D: Intercaste Relations		
Intercaste Marriage Prohibited	0.763	-0.006
	[0.425]	(0.009)
Practice Untouchability	0.133	0.006
	[0.339]	(0.007)

uses population density and controls for area

Table A15: Effect of Adivasi Share on Hindus and on Adivasis

	Hindus		Adivasis	
	(1) Mean if Adivasi Share =0	(2) Adivasi Share Coefficient	(3) Mean	(4) Adivasi Share Coefficient
Panel A: Seclusion				
Ever Worked	0.493	0.219***	0.541	0.020
	[0.500]	(0.059)	[0.498]	(0.050)
Allowed to Work	0.735	0.147***	0.758	0.000
	[0.441]	(0.053)	[0.428]	(0.042)
Own Decision to Work	0.421	0.287***	0.445	-0.019
	[0.494]	(0.077)	[0.497]	(0.076)
Practice Purdah	0.741	-0.262***	0.721	-0.070
	[0.438]	(0.075)	[0.448]	(0.081)
Can Attend Panchayat Meeting	0.091	0.078**	0.090	0.016
	[0.287]	(0.031)	[0.287]	(0.027)
Can Visit Health Center Alone	0.640	0.144**	0.644	0.057
	[0.480]	(0.071)	[0.479]	(0.071)
Can Visit Friend Alone	0.780	0.115**	0.793	0.085*
	[0.414]	(0.046)	[0.405]	(0.045)
Can Take Public Transport Alone	0.475	0.149**	0.476	0.065
	[0.499]	(0.066)	[0.499]	(0.060)
Panel B: Food				
Men Eat First	0.335	-0.215***	0.331	-0.034
	[0.472]	(0.061)	[0.471]	(0.055)
Alcohol Taboo	0.670	-0.134**	0.628	-0.047
	[0.454]	(0.052)	[0.464]	(0.058)
Meat Taboo	0.375	-0.176***	0.331	-0.063
	[0.484]	(0.052)	[0.471]	(0.039)
Panel C: Marriage				
Widow Remarriage Prohibited	0.360	-0.182**	0.352	0.130*
	[0.480]	(0.077)	[0.478]	(0.071)
Practice Dowry	0.777	-0.064	0.752	-0.283***
	[0.416]	(0.054)	[0.432]	(0.068)
No Choice in Spouse	0.558	-0.141**	0.558	-0.082
	[0.497]	(0.062)	[0.497]	(0.062)
Panel D: Intercaste Relations				
Intercaste Marriage Prohibited	0.763	-0.037	0.759	0.012
	[0.425]	(0.053)	[0.428]	(0.057)
Practice Untouchability	0.133	-0.098*	0.123	-0.034
	[0.339]	(0.052)	[0.329]	(0.035)