IMPACT OF BRITISH COLONIAL GENDER REFORM ON EARLY FEMALE MARRIAGES AND GENDER GAP IN EDUCATION:

EVIDENCE FROM CHILD MARRIAGE ABOLITION ACT, 1929

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Abstract

The British colonial government set the minimum age at first marriage for females at 14 years in British India in 1929. It was not implemented until 1930, six months after its announcement. Using the princely states as a control group, we employ a difference-in-differences strategy to estimate the causal impact of abolishing female child marriage below the age of 14. Analyzing historical census data from 1911 to 1981, we find an anticipation effect: female child marriages increased in 1931 but declined sharply in the post-independence period. In the affected regions, underage female marriages declined, and female educational attainment increased in the long term.

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Abstract The British colonial government set the minimum age at first marriage for females at 14 years in British India in 1929. It was not implemented until 1930, six months after its announcement. Using the princely states as a control group, we employ a difference-in-differences strategy to estimate the causal impact of abolishing female child marriage below the age of 14. Analyzing historical census data from 1911 to 1981, we find an anticipation effect: female child marriages increased in 1931 but declined sharply in the post-independence period. In the affected regions, underage female marriages declined, and female educational attainment increased in the long term.

1 Introduction

Child marriage remains a pressing global challenge, with approximately 12 million girls married before adulthood each year (UNICEF, 2017). Child marriage, a critical human rights issue in itself, has been shown to negatively affect female socio-economic status and human capital accumulation (Jensen and Thornton, 2003; Field and Ambrus, 2008; Dahl, 2010; Vogl, 2013). More broadly, marital status has been identified as an important determinant of female labor force participation (Heckman and Macurdy, 1980; Angrist and Evans, 1998; Goldin and Katz, 2002; Stevenson, 2008). This has prompted most countries around the globe to enact various legislations prohibiting the practice of child marriage.

While raising the legal minimum age of marriage is often proposed as a tool for women's empowerment, the effectiveness of such reforms remains uncertain, given their interaction with cultural norms and institutions. Empirical evidence on the impact of post-colonial age-of-marriage laws varies by context and institution (Bharadwaj, 2015; McGavock, 2021; Bellés-Obrero and Lombardi, 2023; Garcia-Hombrados, 2022) and could have unintended consequences (Bharadwaj, 2015). In this paper, we examine the impact of the age of marriage law in the context of colonial India,[1] where universal marriage and early marriage for females was a social norm (Gupta, 2014). The average age of marriage for women in colonial India was 12.7 years (Dyson, 2018), with substantial within-region variations in female child marriages.[2] The variations in marriage market outcomes and gender biases in colonial India are shown to be persistent (Gupta, 2014). We examine whether the British legal reform that raised the age at first marriage had both a short-term and a persistent impact on female outcomes.

Our analysis focuses on the Child Marriage Restraint Act (1929), known as the Sarda Act,

[1] Our analysis begins in 1911, covering the latter part of colonial rule (1911-1947) and extends into post-independence India.

[2] Table A.1 presents the regional variations in the share of married females aged 5–10 years in 1921, using census data. These shares measure the proportion of females between the ages of 5 and 10 years who were or have been married.

which set the minimum legal age at first marriage at 14 years for females in British India.[3] The law was announced six months before its enforcement. The 1931 census report for India noted a large increase in child marriages in the census year and speculated that the rise in marriages was a preemptive measure to circumvent the law. It mentioned that "it was this interval between the date when the Act was passed and the date on which it came into force which was largely responsible for the enormous increase in the numbers of those married below the age of ten years" (Child Marriage Restraint Act, 1930; Census of India, 1931; Census of India, 1931 Vol. 1, Part 1, pp. 229—230).[4] Anecdotal evidence shows that the reaction to the announcement of the policy was so extreme that some high-caste girls married lower-caste men and men with disabilities (Gupta, 2014).

We exploit the unique temporal and geographic variation in the Sarda Act's implementation to provide a systematic empirical analysis of its anticipation effects and to evaluate its long-term impacts. The Sarda Act had two key features: it was announced on September 28, 1929, but enforced six months later on April 1, 1930, and it applied exclusively to British India. This distinction between British India and princely states emerged after the Great Rebellion of 1857. Following the rebellion, administrative control shifted from the East India Company to the British Crown in 1858 (Iyer, 2010). The British Crown, acknowledging the princely states' support during the rebellion, abandoned further territorial annexation plans through Queen Victoria's Proclamation of 1858. While British India's laws were established by the British Parliament, princely states maintained their own courts under their rulers' authority (Interpretation Act, 1889).[5] This semi-autonomous status of princely states continued until their integration into independent India in 1947.

We employ a difference-in-differences strategy to estimate the short-run effect of the law abolishing child marriage in British India districts, using historical census marriage data by district, age, and gender from 1911 to 1931, with districts in princely states as the control group. We begin by establishing parallel trends in female child marriage rates between British India and princely states for both age groups (5-10 and 10-15 years) prior to the reform, using both logs and levels of the rates. We find that child marriage rates for girls aged 5-10 years increased by 18-25% in British India relative to princely states following the Sarda Act's announcement (baseline: 104 marriages per 1,000 girls aged 5-10 years in 1911-1921).

The results are robust to controlling for population changes, region-specific trends, alternative methods of clustering, placebo tests and differential trends between districts with large

[3]While earlier laws had addressed social reforms, such as the Bengal Sati Regulation (1829), the Hindu Widow Remarriage Act (1856), and the Age of Consent Law (1891), this was the first law imposed by the British in British India that specifically restricted child marriage; See Appendix B for further details.

[4]British officials cross-referenced the census records with records on marriage registration, commonly maintained by Christians and Muslims in British India. Hindus did not customarily register marriages, but the marriage pattern of those of other religions for whom it was the norm to maintain registration records, such as Christians, followed the marriage pattern among Hindus (Krishnan, 1977). The British census reports found a significant increase in marriage registrations in the months preceding the date on which the law would come into force. We do not interpret this report as causal evidence of the anticipation effect of the law.

[5]British policy towards the native states evolved from "ring-fence" (1765–1818) to "subordinate isolation" (1818–1858), and finally to "non-annexation with the right of intervention" (1858–1947). See Iyer, 2010 for more details.

or small population sizes. Further, using migration data from 1921 to 1931, we find that the effect is unlikely to have been driven by households sorting according to their marriage norms in response to the Sarda Act. The coefficient estimate of the Sarda Act can be biased if British India and princely states have differential pre-trends in economic opportunities. Drawing on Fenske et al. (2022b), we use the literacy rate of boys aged 10-15 as a proxy for economic opportunities and find no differences in literacy rates of boys aged 10-15 in 1911-1921 between British India and princely states. Further, we find no pre-trends in the population shares of major religious groups (Hindus, Muslims, and Christians) and tribal communities, suggesting that cultural differences driven by religious composition are unlikely to confound our treatment effects. We find that marriage rates for women aged 15-20 rose by 2.1-4.6% in British India relative to princely states in 1931, suggesting that the observed rise in marriages for girls aged 5-10 and 10-15 does not represent an entire shift away from marriage for older girls in the age group of 15-20. Regions with a higher presence of Protestant missions showed greater compliance with the Sarda Act in 1931. Since Protestant missions historically promoted women's education and is associated with higher female marriage ages (Calvi et al., 2022), this finding suggests that pre-existing social norms shaped the effectiveness of marriage age reforms.

We next examine the medium-term effect of the law. If households anticipated strong enforcement of the law and had been deterred from violating it, the child marriage of girls should have declined sharply after the passage of the law. We use historical data from the Census of India between 1911 and 1981 – covering both colonial and post-colonial India – to construct district-level panel data on marital status in the population by age and gender and to estimate the implementation effect of the Sarda Act. We focus on girls aged 10-15 years, as this represents the only age group with consistently comparable marriage data across both the colonial period (1911-1931) and the post-colonial period (1961-1981).[6] We find that the Sarda Act reduced marriage rates of girls ages 10-15 by 51% during 1961-1981, relative to 1921 levels. The results are robust to controlling for long-term population changes and a range of post-colonial policies. This result is in line with the suggestive findings of Hatekar et al. (2007), who uses genealogical data for a sample of women from the State of Maharashtra to provide suggestive evidence of the effectiveness of the Sarda Act.

Our analysis reveals persistent differences in gender-related outcomes between regions formerly under British India and those under princely states. We use decennial censuses for the period 1911-2011 to show the long-run evolution of female marriages in the age group of 10-15 between British India and princely states. To understand whether the historical legal reform has further long-term consequences, we compare British India districts with their neighboring princely state districts. We match each British India district with a neighboring princely state district with the closest baseline demographics at the pre-intervention period, including the prevalence of female marriage at ages 10-15. For each group of matched neighboring British India districts and princely states, we compare the post-independence gender differential in human capital investment between regions formerly under British India and in princely states in pre-independence India.[7] This allows us to control for differences in cultural practices and so-

[6] See Section 4.1 for a detailed explanation.

[7] See Section 6.2 for details on the matching procedures.

cial institutions. We then test for within-pair differences between the regions that were formerly British India and princely states, using independent nationally representative data collected in India after the 1990s: the District Information System for Education (DISE) and the District Level Household and Facility Survey (DLHS). We find that in districts that were formerly under British India, the mean age of marriage is higher by 0.36 years, compared with the districts that were in princely states. We also find that there are 3.54 more girls enrolled in school per 100 boys enrolled for class 7 (approx. 13 years old) in British India districts than those in former princely state districts.

Disentangling mechanisms that underlie persistent effects is empirically challenging. Our heterogeneity analysis by urban population shares provides suggestive evidence of potential channels. If legal enforcement were the primary mechanism, we would expect stronger anticipation effects in urban British India districts given their higher concentration of colonial administrators. Alternatively, if urban areas primarily represented populations more receptive to modern marriage practices, we would expect to observe higher compliance without anticipation effects. The patterns we observe are more consistent with the second hypothesis: urban districts in British India exhibited higher compliance but no anticipation effects compared to urban princely state districts, suggesting cultural norms might have contributed to the reform's persistence. While long-run differences in gender outcomes between British India and princely states could reflect various institutional and economic factors, intergenerational transmission of norms could also play a role.

While our analysis cannot causally identify the mechanisms driving persistence, examining the temporal pattern of effects offers insights into how legal reforms shape social change. The contrast between the short-term and medium- to long-term effects demonstrates that the Sarda Act had a significant impact. In particular, when government policies force social change in some parts of society, the affected group often responds by taking actions to undermine the new policy, sometimes resulting in a backlash. The short-run results provide evidence of that behavior, and yet the medium/long-run results show that the colonial government succeeded in changing practice. The results highlight the importance of very long-run follow-up in studying interventions that promote social change.

This paper contributes to several strands of literature. We add to the literature on the impact of policies aimed at reducing child marriages that have focused on modern age-of-marriage laws (Bharadwaj, 2015; McGavock, 2021; Garcia-Hombrados, 2022; Bellés-Obrero and Lombardi, 2023). Using historical records, we complement this literature by providing a long-run follow-up of the short-run impacts of marriage laws. McGavock (2021) finds an increase in the legal age of marriage delays the age of marriage for females, particularly in regions with a higher preexisting prevalence of child marriages. Similarly, we find areas with an immediate perverse response to the Sarda Act had lower child marriages over time. Bellés-Obrero and Lombardi (2023) shows the age-of-marriage laws resulted in substituting formal for informal unions. In our study setting, marriage was an important social and religious institution (Carroll, 1983). Therefore, delaying female age at marriage had persistent impacts on child marriages.

Our findings suggest that considering historical institutions may be relevant to policy discussions about gender issues. Iyer (2010) shows direct British rule caused lower levels of access to schools, health centers, and roads in post-colonial India. We show that gender reforms in direct British rule regions positively impacted female marriage outcomes and literacy. Our work is closely related to the literature that examines gender differences in colonial India (Gupta, 2014; Fenske et al., 2022a,b). It broadly contributes to the literature that examines the long-term impact of historical economic (Nunn, 2008; Nunn and Wantchekon, 2011; Alesina et al., 2013; Carranza, 2014) and political institutions (Alesina and Fuchs-Schündeln, 2007; Grosfeld and Zhuravskaya, 2015; Becker et al., 2016; Campa and Serafinelli, 2019) on culture and social norms. In particular, this paper builds on the literature on the legacy of colonization policies (Acemoglu et al., 2001; Banerjee and Iyer, 2005; Dell, 2010; Wantchekon et al., 2015; Lowes et al., 2017; Dell and Olken, 2020). Most studies of colonial institutions focus on their effect on economic outcomes and social norms. In contrast, we study the impact of a colonial social policy intervention and its interactions with preexisting traditional practices on gender norms and outcomes.

The findings in the paper also relate to the growing number of studies that highlight the importance of culture for policy (Schoellman and Tertilt, 2006; Alesina et al., 2015; Ashraf et al., 2020; Bau, 2021) and the implications of gender-related social practices (Tertilt, 2005, 2006; Croson and Gneezy, 2009; Fernandez and Fogli, 2009; Alesina et al., 2013; Anderson and Bidner, 2015; Corno and Voena, 2016; Jayachandran and Pande, 2017; Corno et al., 2020). It also contributes to studies on the evolution of culture across generations (Abramitzky et al., 2016; Giuliano and Nunn, 2020). Our correlational evidence on intergenerational transmission align with broader literature showing that early marriage affects children's outcomes and perpetuates across generations (Vogl, 2013; Sekhri and Debnath, 2014; Chari et al., 2017; Fernández et al., 2004; Fernandez and Fogli, 2009).

2 Historical overview

2.1 The Establishment of British Control in India

2.1.1 Evolution of Colonial Rule (1600-1857)

The British first arrived in India in the early 1600s through a trading company called the East India Company (Banerjee and Iyer, 2005). It was not until 1757 that the British had their first military conquest within the present-day area of India, Pakistan, and Bangladesh (Banerjee and Iyer, 2005). The East India Company had experimented with a number of political arrangements to maximize its own commercial profits and minimize administrative liabilities (Iyer, 2010). Some states were brought directly under its control, and some states entered into political and commercial treaties. This experiment came to an end with the Great Revolution of 1857, when the British government took control (Iyer, 2010).

2.1.2 British Colonial Administrative Structure Post-1857

Following the revolution, the British government divided its territories into British India and princely (or native) states, according to the Interpretation Act of 1889. While British India was governed directly by the Governors-General, the princely states were independent kingdoms of Indian kings who accepted British suzerainty. These states were overseen by the Viceroy or the Governors-General, who was the chief administrator in India and the monarch's representative. The legal framework clearly delineated dominion from suzerainty, with British India's laws deriving from the British Parliament and the legislative authority extending to both the central and local governments. In contrast, the princely states maintained their judicial systems under the authority of their respective rulers (Interpretation Act, 1889). Although indirect control was exerted over the princely states, the rulers of those regions were not passive figures. The indigenous rulers had their own customs and laws, which they insisted on preserving (Ramusack, 2003).

2.2 British Legal and Social Reforms

Prior to British governance, Indian territories adhered to a variety of religious laws for personal matters such as marriage, maintenance, succession, and legitimacy. These included the Dayabhaga and Mitakshara laws for Hindus, the literary traditions of Ithna Ashari and Hanafi for Muslims, and several customary laws for tribal communities (Carroll, 1983). Upon assuming control, the British promised not to interfere with these personal laws[8] (Carroll, 1983). However, they retained the right to intervene using statutory laws that could override these personal laws, enabling social reforms at the Governor-General's discretion (see Appendix B).

2.3 Child Marriage Restraint Act, 1929 (Sarda Act)

2.3.1 Social Context and Need for Reform

Early 20th-century India faced significant social challenges due to widespread child marriage, with young girls often married before reaching adolescence (Mukherjee, 2006; Bagchi, 1993). The practice's detrimental effects on children's health and well-being (Srinivasa Aiyar, 1930) prompted legislative action when Hai Sahib M. Har Bilas Sarda introduced a reform bill in the Legislative Assembly on February 1, 1927.[9]

[8]Personal laws in India refer to the legal framework that governs family and personal matters specific to different religious communities.

[9]The British colonial government in India was headed by the Viceroy and appointed members of his council. Each of the 11 provinces in British India had its own governor, who was assisted by a provincial legislative council of appointed officials. A small fraction of Indian local elites were also appointed but were restricted to consulting. The Indian Councils Act of 1909 allowed 135 Indians to be elected to both the imperial council and the provincial legislative councils. However, the governor was not responsible for these elected Indian members, who were restricted to an advisory role. For details, see www.parliament.uk.

2.3.2 Legislative Process and Key Provisions

Despite significant opposition from orthodox sections of society (Hatekar et al., 2007), the Select Committee revised the bill to apply universally across British India and criminalized the solemnization of child marriages (Srinivasa Aiyar, 1930). The resulting Child Marriage Restraint Act of 1929 (Sarda Act), enacted on September 28, 1929, established minimum marriage ages of 14 for girls and 18 for boys.[10] The law, effective April 1, 1930, imposed penalties of up to Rs 1,000 and one month's imprisonment for facilitators of child marriages.[11] Under Section 108 (a) of the Indian Penal Code, any citizen of British India aiding in the contract of child marriage within British India and beyond could be prosecuted (Srinivasa Aiyar, 1930). Therefore, citizens of British India could not avoid the law by migrating to the princely states.

2.3.3 Scope, Applicability, and Implementation

The effectiveness of the Child Marriage Restraint Act (Sarda Act) depended on several conditions. First, if marriage were largely ceremonial and cohabitation substituted for marriage, then the law may not have impacted economic outcomes. Second, child marriages, particularly for females under 14, had to be prevalent in parts of society for the Act to be binding. Third, the population had to expect the law would be enforced on the ground.

The historical context satisfied these conditions. Marriage in India was not merely ceremonial but deeply institutionalized through religious doctrine (Carroll, 1983). Given the significant social and religious importance of marriage, British rulers initially hesitated to introduce marriage reform laws (Mukherjee, 2006).[12] This policy of non-intervention was ultimately superseded in 1929 through the diplomatic efforts of Sir James Crerar, whose strategic mobilization of Assembly support facilitated the passage of the Sarda Act (Mukherjee, 2006).

Evidence from the 1921 census confirms the widespread prevalence of child marriage, showing significant regional variation in marriage rates among females aged 5-10 years (see Table A.1). The expectation of enforcement by the Indian population was demonstrated by their response to the law's announcement. The Census Reports document a rush of marriages as families attempted to bypass the impending restrictions. A case in point was the Nasik court's intervention to prevent the marriage of a 10-year-old Brahmin girl, where the father argued that keeping his daughter unmarried past 14 violated religious doctrine (*Shastras*).[13]

To ensure effective implementation, authorities distributed multilingual pamphlets across towns and villages (Kalaivani, 2015). The Census of India (Vol-I) reported that successful en-

[10] In 1872, before the Sarda Act (1931), a group called Brahmo Samaj led by Raja Ram Mohan Roy abolished the marriage of girls below 14 years of age under legislation entitled the Native Marriage Act. However, this only applied to the members of that group.

[11] Marriages that already occurred in contravention of this Act were not made void. The Act made the solemnization of child marriages a punishable offense. The penal provisions did not impose penalties on the child.

[12] India Office observations on marriage legislation in July 1929 stated that "the position of an alien Government vis-a-vis attempts at legislative reform of social abuses which invariably have religious sanctions behind them, has been notoriously difficult in view of pledges of religious neutrality and of non-interference with religious practice" (Mukherjee, 2006).

[13] See Appendix–C for details on the anticipation effect mentioned in the census reports.

forcement relied heavily on private citizens and reform associations reporting violations. The first conviction occurred in Lahore in 1930, with 33 prosecutions documented by February 1931. While enforcement was stronger in areas with active reform associations, prosecutions occurred even in remote villages like Noakhali in Bengal and against village *munsiffs* in the Madras presidency, demonstrating the law's practical reach.

Women's organizations played a crucial role in the law's implementation and acceptance. The All-India Women's Conference (AIWC), Women's Indian Association, and National Council of Women in India successfully lobbied for political support and secured influential endorsements, including Gandhi's public opposition to child marriage (Raman, 2009; Mukherjee, 2006). These organizations conducted nationwide educational campaigns and pursued legal action against violations, as exemplified by Assam *Mahila Samiti*'s 1934 legal notice to Durgeshwar Bujarbarua for planning an underage marriage.

2.4 Marriage Reforms in Princely States

In contrast to British India, there were very few marriage reforms in the princely states (Ramusack, 2003). Mysore, in 1894, abolished the marriage of girls below the age of 8 years, as well as the marriage of girls under 16 years of age to men older than 50 years (Ramusack, 2003). In the face of widespread discontent among the masses, the Mysore Princely State implemented this reform largely by occasionally prosecuting powerless lower-caste members (Ramusack, 2003). According to the Census Report (1931, Vol.1), the Baroda government introduced the Infant Marriage Prevention Act in 1904, which set the minimum marriage age at 12 for girls, though the Kadva Kunbis community was exempted until 1922. In 1930, this exemption was removed, and the law was amended to void all marriages involving boys under eight and girls under 6. Furthermore, anyone involved in facilitating marriages of boys under 16 and girls under 14 faced penalties, including imprisonment and fines.

Jammu and Kashmir also enacted child marriage laws in 1930 that conformed with the Sarda Act (1929) (Census Report, 1931, Vol.1). Following the precedent set by the Sarda Act in British India, Mysore State passed a bill in 1931 that allowed marriages of girls aged 12 under certain conditions (Census Report, 1931, Vol.1). In the State of Idar, an act was proposed that would prohibit the marriage of girls under 14 and boys under 18, with an additional clause that men over 45 years could not marry women less than half their age (Census Report, 1931, Vol.1).

2.5 Marriage Reforms in Post-independent India

After India gained independence in 1947,[14] the Sarda Act was amended in 1949 to raise the minimum marriage age for girls to 15, and again in 1978 when it was increased to 18, applicable throughout India (Mahmood, 1980; Mukherjee, 2006; Tandon, 2010). Despite these amendments, the impact on the age at first marriage for girls remained limited (Bharadwaj, 2015), particularly in rural areas where local officials, often embedded in traditional practices, were responsible for enforcement.

[14]See Appendix–D for details on the swift integration of the princely states with the Dominion of India.

3 Conceptual Framework

The impact of raising the minimum legal age for marriage through legal reforms is theoretically ambiguous. Parents may opt to pay the penalty and continue to marry daughters below the legal age. Additionally, the long-term effects of such reforms may not persist if enforcement weakens, allowing social norms to revert to pre-reform levels. Thus, whether legal reform can effectively alter entrenched cultural practices remains an empirical question.

We first assess the immediate effect of the law. In early 20th-century India, if the preferred age of marriage for some families was below 14, the announcement of the Sarda Act may have prompted families to marry daughters earlier than planned to avoid legal penalties. In contrast, households that typically married daughters after the age of 14 would likely remain unaffected. Census data on marital status for 1921 shows that approximately 10% of girls in the age group of 5–10 years were reported to be married (see Table A.1), implying that a sizeable proportion of the population in the age group would be affected by the legal marital reform.

The extent of the reaction depended on households' expectations regarding enforcement. If families believed the law would be strictly enforced, they were more likely to rush marriages before its implementation. Given that the British colonial administration, rather than local elected representatives, was responsible for enforcement, households may have anticipated stronger implementation due to the lower political cost for colonial authorities (Besley and Coate, 2003). Our difference-in-differences model estimates the effect of the announcement of the law on the likelihood of girls in the age group 5-10 years getting married when households *perceived* strong enforcement of the law on the ground.

Our medium-term difference-in-differences estimate tests the impact of the law on marriage age approximately 30 years after its implementation. If the law had a persistent effect on girls' marriage age—for example, by changing social norms around marriage in the impacted regions—then girls' age at first marriage should be higher than pre-intervention levels relative to the princely states.

As social values evolve, laws prohibiting child marriage may appear more acceptable to communities, creating a "magnet effect" (Aldashev et al., 2012). This effect can accelerate the transformation of traditional customs and establish a new social coordination equilibrium. To examine the long-term impact of the law, we compare neighboring districts with similar pre-intervention demographic characteristics and child marriage rates for females but different historical marriage laws. This approach helps us account for shared market conditions, ethnic composition, and regional cultural practices.

It has been shown that former princely states have higher levels of access to health centers, schools, and roads compared to former British districts (Iyer, 2010). Table A.2 compares economic variables between British India and princely states in the 2000s. We see that princely states have a higher income per capita compared to British India. Therefore, princely states might be expected to have more market opportunities compared to British India, which might

encourage more girls in princely state districts to go to school. In our analysis, we find that districts in former British India have better female marriage and schooling outcomes compared to districts in former princely states. This difference in gender-specific human capital investment between princely states and British India may be associated with legal gender reforms that were introduced by British colonizers in British India.

4 Short Run and Medium Run Analysis

4.1 Data

Our main source of information identifying the administrative divisions of British India and the princely states is the Administrative Atlas of India, Census of India (2011), which includes information on whether each district in the census was a part of British India or a princely state. As the landscape of British India and the princely states was mostly settled by 1857, we define a district as being in British India according to the Administrative Atlas of India; otherwise, it is defined as a princely state. We supplement the definition with Baden-Powell (1892), which includes a detailed map of the divisions between areas in British India and the princely states, as well as the year of acquisition for each district. The geographical distribution is presented in Figure 1.

To analyze marriage patterns and the immediate impact of the 1929 Sarda Act, we digitize district-level Census of India data covering most of British India and the princely states from 1911-1931. The dataset includes population and marital status (married, widowed, and total population) by gender for three age groups: 5-10, 10-15, and 15-20 years. The census data are collected at 10-year intervals in 1911, 1921, and 1931. The reliability of these marriage statistics is well-established. Child marriage trends during 1901-1931 have been extensively studied by historians and statisticians (Agarwala, 1962; Malaker, 1973), with a particular focus on the rise in child marriage rates in 1931. Furthermore, marriage data from the Indian Census are used in the work of economists and historians to gain a deeper understanding of gender bias in marriage patterns in colonial India (Gupta, 2014; Fenske et al., 2022a).

British had a system to accurately collect data every ten years from 1881 onwards. The data collection process was improved in 1901 (See Fenske et al. (2022a) for more details on data collection of colonial censuses). Our analysis focuses on the 1911-1931 period because these years provide consistent variable definitions and comprehensive coverage across British Indian territories and princely states. The dataset encompasses districts in Assam, Baroda, Bengal, Bihar and Orissa, Bombay, Central Provinces, Gwalior, Hyderabad, Madras, Punjab, Rajputana, Central India Agency (CIA), and United Provinces.

To study the effect of medium-run implementation, we further digitize data from the Census of India from 1961 to 1981. We collect data on the population and marital status by gender for the age group 10-15 years. We link census data between 1911-1931 with census data from 1961-1981 to analyze the medium-run effect in the post-independence period.[15] The age interval

[15] In Appendix F, we describe how we match districts across different census years.

for female marital status data in the younger age group differs between the 1961-1981 and 1911-1931 census periods. During 1961-1981, census data on the marital status of young girls were grouped in the age interval of 0-9 years, making marital status data for females aged 5-10 years unavailable. Therefore, we use the share of married girls aged 10-15 years, which is consistently available in census data from 1911-1981, as our outcome measure to examine the medium-run effect of the Sarda Act. The resulting panel dataset at the district level spans 1911-1931 and 1961-1981 in 10-year intervals (see Table A.17 for summary statistics by year and region).

The availability of census data is limited for the census years 1941 and 1951, possibly due to World War II and other political factors (India Office of the Registrar, 1962). For the 1941 census, data on marriages by gender and age were presented at a restricted scale in the form of sample estimates for many of the provinces. The 1951 census used different age groupings for marriage totals by gender (5-14 and 15-24 years) compared to all other census years. To provide evidence of the transition following the policy, we use marriage data for ages 5-10 and 10-15 from the 1941 census, which is available for Baroda, Bengal, Bombay, Gwalior, Hyderabad, Mysore, and Rajputana.[16]

4.2 Empirical Strategy

We argue that the Sarda Act affected marriage practices among Indians in British India by abolishing their traditional marriage customs. Figure A.1 plots the percentage of married children in the age groups of 5-10 and 10-15 years from 1911 to 1931 for the whole of India by gender. The marriage pattern was stable from 1911 to 1921, while in 1931, marriage rates increased dramatically for all young age groups, particularly among females. According to the Census of India 1931 report, this surge in marriages likely resulted from an anticipation effect during the six-month interval between the Act's announcement and its implementation.

To test for the short-run impact of the Sarda Act, we use a difference-in-differences strategy to estimate the impact of the Sarda Act in 1931. We exploit the fact that the Sarda Act applied only to British India districts and use the princely states as the control group. We compare child marriage rates in 1931 between British India districts and princely states, accounting for baseline differences in 1911-1921, before the Act's announcement and introduction. Since the Sarda Act was announced on September 28, 1929, but implemented only in April 1930, our estimates using census data from 1911, 1921, and 1931 likely capture primarily the announcement effect of the Act on child marriage rates.

We examine the Sarda Act's effects on marriage rates among girls aged 5-10 and 10-15 years. For each age group, we employ two specifications. First, we analyze the share of married females, which is calculated as the proportion of married and widowed females in the total female population of that age group. Second, we estimate the effect using the log of married share as the outcome variable, which captures changes relative to baseline marriage rates.[17] Using

[16]The estimates for Madras from the digital Census 1941 PDFs were not legible.

[17]The log specification estimates the percentage change in child marriage rates relative to baseline levels, which is particularly relevant given the heterogeneous baseline rates across districts, as shown in Table A.1. Specifically, β in equation (1) measures the effect of the Sarda Act in percentage terms.

census data, we construct the marriage share for each age group as $m_{it} = \frac{married_{it}+widowed_{it}}{total_{it}}$, where $married_{it}$ represents married females, $widowed_{it}$ represents widowed females, and $total_{it}$ represents the total female population in district i in year t. Thus, m_{it} captures the proportion of females who are or have been married. We estimate the following equation:

$$y_{it} = \beta BI_i \times D_{1931} + \mu_i + \gamma_t + \eta X_{it} + \epsilon_{it} \tag{1}$$

where y_{it} is either the log rate of child marriage ($ln\ m_{it}$) or the child marriage rate (m_{it}) in district i in year t; D_{1931} is an indicator for the year 1931; BI_i indicates whether district i was part of British India; μ_i represents district fixed effects; γ_t represents year fixed effects; and ϵ_{it} is the error term. X_{it} includes district-level controls, and standard errors are clustered at the district level.

As robustness checks, we implement several alternative empirical strategies to establish the "rush to beat-the-policy" effect by the Indian communities. First, we extend our analysis to females aged 15-20 years to understand how the policy affected marriage patterns across different age groups. Second, we augment our differences-in-differences specification with region-specific time trends to control for unobserved changes in each historical province (there are 13 regions in our estimation sample);[18] for example, demographic trends or changes in cultural practices.

Third, we account for potential differences in socioeconomic conditions between large and small districts. While district fixed effects control for these differences, we conduct an additional robustness check: for marriage outcomes of females aged 5-10 and 15-20 years, we interact the 1911 population size (log, ages 10-15) with time trends to control for differential trends correlated with initial district size. For the 10-15 age group, we use the initial population of ages 15-20 years to construct these interaction terms.

For the medium-run analysis, we use the log (and level) married share of girls aged 10-15 years (i.e., 10-14.99 years) as the outcome variable. To estimate implementation effects in the medium run, we use our district panel data from 1911 to 1981, matched across census years. We estimate the medium-term effects during 1961-1981 using the following specification:

$$y_{it} = \sigma_1 BI_i \times D_{1931} + \sigma_2 BI_i \times Post_{(1961-1981)} + \mu_i + \gamma_t + \eta X_{it} + \epsilon_{it} \tag{2}$$

where the outcome variable y_{it} is either the log rate of child marriage among girls aged 10-15 years ($ln\ m_{it}$) or the level of child marriage rate (m_{it}) in district i in year t. D_{1931} is an indicator for the year 1931, $Post_{(1961-1981)}$ is an indicator for the years 1961-1981, BI_i indicates whether district i was part of British India, μ_i is a district fixed effect, γ_t is a year fixed effect, and ϵ_{it} is the error term. X_{it} represents district-level controls, including the log population of males aged 10-15 years. Standard errors are clustered at the district level. σ_2 estimates the medium-run impact of the Sarda Act.[19] A negative σ_2 would indicate that the Sarda Act successfully reduced

[18] This includes Assam, Baroda, Bengal, Bihar and Orissa, Bombay, CIA, Central Province, Gwalior, Hyderabad, Madras, Punjab, Rajputana, and UP.

[19] For log proportion of females married in ages 10-15, σ_2 estimates the treatment effect on British India districts relative to pre-treatment level (mean of 1911-1921).

child marriage rates in British India in the medium run. We also estimate a flexible specification by replacing the $Post_t$ indicator with yearly indicators for 1961, 1971, and 1981 in equation (2). This allows us to estimate the dynamic effects of the Sarda Act at 31, 41, and 51 years after its implementation.

4.3 Short-Run Results: Main Outcomes

For a causal interpretation of our difference-in-differences coefficient, we must establish that British India districts and princely states exhibited parallel trends in the outcome variable prior to the Sarda Act. We formally test this parallel trends assumption using data from 1911-1921. Our specification interacts an indicator for British India (BI) with an indicator for the year 1921 to examine whether the two regions experienced different trends in the outcome before the reform. The results, presented in Table 1, suggest no differential trends existed prior to the reform, supporting the validity of our identification strategy.

Panel (a) of Table 2 presents estimates of the short-run effects of the Sarda Act using equation (1). In Column (1), we find that the Act increased child marriage rates in British India by 18% in 1931 relative to princely states.[20] The effect diminishes monotonically for older age groups: we find a 6% increase for girls aged 10-15 years and a 3.5% increase for those aged 15-20 years. Panel (b) reports the effects in levels rather than logs. The Act increased marriage rates for girls aged 5-10 years by 1.54 percentage points, representing a 15.4% increase from the mean marriage rate of 0.10 in 1921. For older age groups, we find increases of 1.65 and 2.3 percentage points for ages 10-15 and 15-20, respectively. This is about 3.8% (10-15) and 2.7% (15-20) increase relative to the baseline mean in 1921.[21]

To assess the robustness of our results in Table 2, we address potential differences in unobserved trends between British India districts and princely states. These regions, situated in different geographical areas of India, may have experienced distinct social and cultural changes over time. Column (2) of Panel (a) in Table 2 controls for historical region-specific trends to account for this heterogeneity. The short-run effect of the Sarda Act on marriage rates for girls aged 5-10 remains robust, with a point estimate remarkably similar to our baseline specification in Column (1), albeit with larger standard errors. For girls aged 10-15, the effect becomes statistically insignificant after controlling for regional trends. Similarly, the increase in marriage rates for females aged 15-20 remains small after accounting for these unobserved trends.

To address potential differences in economic trends between British India districts and princely states, we control for initial population levels interacted with time trends. Districts with larger initial populations may have experienced economic booms that could confound our estimates. Column (3) includes an interaction between the log population in 1911 and a time

[20] For the log proportion of married girls aged 5-10 years shown in Table 1, our estimates measure changes in marriage rates as a percentage of the baseline level. This approach accounts for regional heterogeneity in baseline marriage rates. While districts may have different initial marriage rates for girls aged 5-10 years, the response to the Sarda Act's announcement is proportional to the average level of child marriage in 1911-1921. This follows the approach of Jayachandran et al. (2010), who similarly uses log mortality rates when examining the impact of modern medicine on maternal mortality.

[21] The average share of female married for age 10-15 and 15-20 in 1921 are 0.435 and 0.846, respectively.

trend. Panel (a) shows that after controlling for population-specific trends, British India experienced a 24.6% increase in child marriage rates. This larger estimate suggests that unobserved factors correlated with population trends likely biased our previous results downward. For females aged 10-15, we find an 8% increase in marriage rates after controlling for population trends, though this effect becomes smaller and less precise when we additionally control for province-specific trends. The coefficient for females aged 15-20 remains small and stable across all specifications.

In Panel (b), the coefficient for marriage levels in the 5-10 age group maintains a similar magnitude when controlling for population-specific trends, though with reduced precision. The point estimate remains robust and statistically significant when we additionally control for both log population $\times$ time trend and region-specific trends in column (4). This stability suggests that unobserved differences between British districts and princely states do not drive our estimated anticipation effect of the Sarda Act. For the 10–15 age group, we find no statistically significant effects on marriage shares after controlling for population trends. The coefficient for marriage levels in the 15-20 age group similarly remains stable across all specifications.

Our findings indicate that the announcement of the Sarda Act led to an 18-23% increase in marriage rates among girls aged 5-10 years in British India relative to princely states. This increase is substantial given the high baseline rates: in 1921, approximately 100 per 1,000 girls in this age group were or had been married. The minimal change in marriage rates among those aged 15-20 suggests that our findings cannot be explained by a simple downward shift in marriage age. If families were merely moving marriages from the 15-20 age group to younger ages, we would expect to see a corresponding decrease in marriage rates for the older age group, which we do not observe.

4.4 Results: Additional Outcomes

4.4.1 Effects of Male Marriage: Age 15-20

The *Sarda Act* of 1931, which led to increased marriages of girls aged 5-10 years, could potentially affect marriage patterns for boys as well. Since Agarwala (1957) reports that the average age of marriage for boys in 1921-1931 was 18.44 years, we examine whether changes in female marriage age impact marriage rates among boys aged 15-20 years.

To analyze this relationship, we estimate Equation 1 using the marriage rate of boys aged 15-20 as the outcome variable. Our results, presented in Appendix Table A.3, show no significant effect on marriage rates for boys in this age group. This suggests that parents rushing to arrange marriages for their daughters before the child marriage restrictions take effect likely choose either younger boys or older men as potential grooms.

4.4.2 Effects of Female Literacy

Early female marriage has been shown to result in lower female educational attainment (Field and Ambrus, 2008). Therefore, laws that affect the age of marriage for females are expected to impact human capital accumulation outcomes for females.

Due to differences in age groupings in literacy data across the Indian census years 1911-1931, we cannot estimate an immediate effect of the Sarda Act on female literacy rates in the age group of 5-10. As an alternative, we test for the short-run effect of the Sarda Act on female literacy rates in the age group of 10-15, as shown in Table A.4. We do not find a statistically significant effect of the Sarda Act on literacy rates in ages 10-15. The coefficient estimates are imprecise, possibly due to the overall low level of female literacy during this period - the average literacy rate of females aged 10-15 was 2.3% in 1921.

4.4.3 Heterogeneity by Presence of Protestant Missionaries

The 1931 census reports cited religious norms as one of the key reasons the Indians married their daughters below 14. The increase in marriages in ages 5-10 as a response to anticipation of the enforcement of the child marriage prohibition law could be less in districts with religious norms that are associated with better female outcomes.

According to Calvi et al. (2022), Protestant missions, representing 54% of all Christian mission settlements by 1911, significantly shaped colonial Indian education through their focus on mass literacy and universal education (Mathew, 1988; Bellenoit, 2007). Unlike Catholic missionaries who prioritized elite education (Mathew, 1999), Protestant missionaries consistently promoted universal learning with a distinctive emphasis on female education (Becker and Woessmann, 2008) through their innovative "zenana education" system. This approach, where female missionaries taught directly in household women's quarters, effectively circumvented cultural barriers to women's public education (Srivastva, 1991; Singh, 2013). The curriculum evolved from basic literacy and arithmetic to advanced subjects like mathematics and history, establishing a foundation for women's education in colonial India (Forbes, 1986).

Calvi et al. (2022) finds that Protestant missions in colonial India are associated with higher female literacy rates and later ages at first marriage. If a stronger presence of Protestant missionaries serves as a proxy for social norms favoring later female marriage, we would expect greater compliance with the Sarda Act in districts with more Protestant missions. Using data on Protestant missionaries from the World Atlas of Christian Missions (Dennis et al., 1911), we test for heterogeneity in the short-run effect based on the extent of Protestant missionary presence.

We define a district-level indicator MI_i that equals one if the number of missionaries in a district is above the median, and estimate the following equation for the short-run effect:

$$y_{it} = \beta_1(BI_i \times D_{1931} \times MI_i) + \beta_2(BI_i \times D_{1931}) + \beta_3(MI_i \times D_{1931}) + +\mu_i + \gamma_t + \eta X_{it} + \epsilon_{it} \quad (3)$$

The coefficient β_1 captures the differential effect of the Sarda Act between districts with higher versus lower presence of Christian missionaries. In Appendix Table A.5, we show that in British India, districts with a larger presence of Protestant missionaries experienced a reduction in marriages of girls aged 5-10 in 1931, suggesting higher compliance with the law rather than

perverse anticipation effects. While districts with a lower presence of Protestant missions saw a 37-46 percent increase in female marriages in ages 5-10 (measured by the coefficient on $B_i \times D_{1931}$), districts with a higher presence of Protestant missions experienced a 4.8-5.8 percent decrease (sum of coefficients on $B_i \times D_{1931}$ and $B_i \times D_{1931} \times MI_i$).

Our findings suggest that districts with a stronger presence of religious norms supporting female empowerment through education showed less urgency to circumvent the child marriage restrictions and demonstrated higher compliance with the Sarda Act. These results indicate that the Act was more effective in areas where local norms already favored later marriage for women, thus reinforcing existing social preferences.

4.4.4 Heterogeneity by Presence of European and American Migrants

To address potential concerns that the heterogeneous effects of the Sarda Act in areas with Protestant missions were driven by a higher concentration of Western immigrants rather than by missionary influence on local social norms, we examine differential responses based on the share of European and American settlers. Utilizing digitized district-level birthplace data from Chaudhary et al. (2025), which we further refine to accurately quantify the share of European and American residents, we examine heterogeneous effects while accounting for region-specific and population trends. As shown in Appendix Table A.6, we find no statistically significant differences in response to the Sarda Act between districts with lower and higher shares of European and American settlers. This suggests that the differential compliance with the Act was driven by missionary influence on local social norms rather than by the presence of Western immigrants.

4.4.5 Placebo Tests for the Impact by Protestant Missions

In Appendix Table A.7, we conduct a placebo test examining the role of Protestant mission presence. Our analysis confirms that the anticipatory effect of the Sarda Act remains stable and statistically significant even after accounting for Protestant mission presence in 1931. While districts with greater Protestant mission presence in 1931 show an 8-15 percent reduction in marriages among girls aged 5-10, this effect becomes statistically insignificant after controlling for region-specific trends and population characteristics.

4.5 Robustness Tests

4.5.1 Balance Test for Outcome Correlated with Differential trends

British India and princely states may have experienced differential development in skilled employment, urbanization, and income that could correlate with the effects of the Sarda Act. Following Chaudhary and Fenske (2020), who show that increased public investment in rail networks led to a demand-driven rise in education, particularly for boys between 1881 and 1921 in colonial India, we use male literacy rates as proxies for differential economic opportunities between princely states and British India. Using digitized literacy data for boys aged 10-15

from 1911 to 1921, we find no significant differences in literacy rates between British India and princely states. These results are presented in Appendix Table A.8.

Marriage age practices in colonial India were primarily shaped by religious and cultural norms (Carroll, 1983). In Appendix Table A.8, we also demonstrate the absence of differential pre-trends in the population shares of major religious groups (Hindus, Muslims, Christians) and tribal populations between British India and princely states. This evidence suggests no statistically significant demographic shifts during the pre-treatment period.

4.5.2 Spatial Correlation

Marriage markets in India operate primarily at the district level, with limited cross-district migration. Kone et al. (2018) documents that 66% of *migrants* remain within their origin district and only 2.8% of the population moves across district boundaries, using 2001 Census data. This local nature of marriage markets suggests that marriage-related shocks in one district would have minimal spillover effects on neighboring districts. Nevertheless, to account for the potential correlation in random shocks to marriage behavior between nearby districts, we cluster the standard errors at the region level as a robustness check.

In Appendix Table A.9, we report standard errors allowing for spatial correlation following the method in Colella et al. (2019)[22]. Our main results on the short-term impact of the Sarda Act remain robust when accounting for spatial correlations.

Given that our sample contains a small number of regions that vary in size, which may bias standard errors in clustering (MacKinnon et al., 2017; MacKinnon and Webb, 2017; Djogbenou et al., 2019), we conduct additional robustness checks. In Appendix Table A.10, we show that our findings on the percent change in marriage rates remain robust to clustering at the region level using the wild-bootstrap cluster method.

4.5.3 Placebo test

To further examine whether the short-run impact of the Sarda Act is not biased by omitted variables correlated with the timing of the Act, we test for null effects on outcome variables that are less likely to be impacted by the Sarda Act and changes in female marriage age, while measured consistently across both British India districts and princely states.

We test for null effects of the Sarda Act on population changes in the age group 40-60, as changes in female marriage age are unlikely to affect the total population of older cohorts in the very short run. In contrast, sudden economic shocks such as disasters or famines would likely affect the population of older cohorts. Due to data limitations in the census, we cannot examine these effects for smaller age ranges within these older cohorts.

[22]Colella et al. (2019) implement Conley (1999)'s cluster data structure by defining a circle around each unit to specify the spatial extent of dependence, allowing for potential decay in spatial correlation.

In Appendix Table-A.11, we find no statistically significant effect of the Sarda Act on the population in ages 40-60, supporting that the increase in female marriages observed in ages 5-10 in 1931 in British India is likely not due to other omitted factors.

4.5.4 Short-run Effects including Pakistan and Bangladesh in colonial sample

We digitized marriage data from the Census of India 1911-1931 for districts in present-day Bangladesh and Pakistan to estimate the short-run effect of the Sarda Act on a broader colonial sample. Appendix Table A.12 presents summary statistics of the share of married females aged 5-10 in Pakistan and Bangladesh districts during 1911-1921. We observe higher shares of married females in the regions of Assam and Bengal (regions with British India districts) than in the regions of North-West Frontier and Punjab.

In Appendix Table A.13, we find that the coefficient estimate of the treatment effect on the log share of females married in ages 5-10 ranges between 0.24-0.27, comparable in magnitude to our main sample estimates that include only territories of present-day India. These estimates are statistically significant at the 1-5 percent level and robust to controls for population and region-specific trends. The coefficient estimate for the share of females married in ages 5-10 is 0.02, statistically significant at the 10 percent level, consistent with our main sample findings.

For post-independence analysis of medium-run and long-run effects, we restrict our sample to present-day India, excluding territories in Pakistan and Bangladesh. This choice reflects the distinct political trajectories of Pakistan and Bangladesh, characterized by periodic bureaucratic and military coups and democratization attempts, in contrast to India's relatively stable political path (Tudor, 2013; Oldenburg, 2010; Riaz, 2016). Including Pakistan and Bangladesh in post-independence analysis would complicate the causal interpretation of the Sarda Act's persistent impact, as time-varying political factors correlated with British India's status in these countries could explain divergent marriage patterns between former British India districts and princely states.

4.5.5 Misreporting of Age

In Appendix A.14, we examine potential age misreporting and its relationship to children's marital status. If households are more likely to misreport the age of married children, this may cause measurement errors in our specification that are correlated with the treatment variable. To rule out misreporting of the age group, we conduct checks of the age structure by comparing the number of females reported to be aged 5–10 and 10–15 years in each district and estimate whether this is correlated with the treatment variable for the announcement effect. We find no evidence that the announcement changed the reported age structure of the census; hence, age misreporting does not confound the interpretation of our estimate.

4.5.6 Migration as a confounder

Selective migration in response to and anticipation of the Sarda Act could confound our estimates if households sorted across districts based on marriage norms. However, this form of selection bias is unlikely in our context. Empirical evidence documents strong in-group preferences in Indian marriage markets (Banerjee et al., 2013; Munshi and Rosenzweig, 2016), making migration to communities with different marriage norms less likely. Moreover, individuals typically maintain frequent interactions and close social ties within their own social groups, which provide crucial informal insurance networks (Caldwell et al., 1986; Mazzocco and Saini, 2012; Munshi and Rosenzweig, 2016).

We examine the extent of migration in the period of 1921-1931 in British India and the princely states using migration data from the census report that indicates the origin and destination provinces/states.[23] This allows us to understand the pattern of migration between British India and the princely states. Appendix Table A.15 presents the province/state level summary statistics on migration from 1921-1931.

Appendix Table A.15 documents low migration rates during this period, consistent with evidence from post-independence India. In 1921, British India districts averaged 25 emigrants per 1,000 population, while princely states averaged 68 emigrants per 1,000 population. Migration levels remained stable between 1921 and 1931 across both British India and princely states, suggesting limited migration responses to the Sarda Act. British India's emigration rate declined marginally from 25 to 24 per 1,000 population between 1921 and 1931 (see Appendix G for detailed discussion).

Further supporting our identification strategy, if households sorted across regions based on marriage norms in response to the Sarda Act, we would expect to observe systematic changes in emigration from British India to princely states. However, emigration from British India to princely states remained remarkably stable: 5.66 emigrants per 1,000 population in 1921 compared to 5.9 in 1931. The combination of low overall migration rates and the absence of systematic changes in migration patterns between British India and princely states suggests that our estimates measure the causal impact of the Sarda Act rather than the selective sorting of households across districts.

4.5.7 Heterogeneity by sex-ratio

An imbalance in the sex ratio due to differential mortality or sex-selective abortion may affect the age of marriage. Bergstrom and Lam (1991) show that changes in sex ratios in the marriage market can be equilibrated through changes in the age at marriage. Typically, the scarcity of males at marriageable age in the marriage market would cause higher age at marriage for females. We examine heterogeneity in response to the Sarda Act by female share in the population aged 5-10.

[23] In British India, the majority of the population is in districts that belong to British India (83%-100%), while it also includes districts that belong to princely states.

We estimate a specification similar to equation (3) but replace the missionary presence indicator with $HighFemaleShare_i$, which equals one if a district's share of females in the population aged 5-10 in 1921 exceeds the sample median. As shown in Appendix Table A.16, we find no differential impact of the Sarda Act across British India districts with varying female population shares.

5 Medium Run Implementation Effects

5.1 Effects on Child Marriage: Ages 10-15, 1911-1981

Appendix Table A.17 shows regional variations in the proportion of married females aged 10-15. Figure 2 illustrates the average proportion of married females aged 10-15 in British India and princely states from 1911 to 1981. The share of married females in this age group decreased significantly between 1961-1981 compared to 1911-1921. Notably, British India experienced a steeper decline in the proportion of married females than princely states.

Table 3 presents estimates from equation (2). Consistent with Figure 2, the implementation of the Sarda Act led to a significant decline in child marriage among females aged 10-15 years. The Act reduced the proportion of married females in this age group by 51% relative to baseline levels in British India. Column (2) confirms the robustness of these marriage rate estimates. The short-run effects of the 1931 Sarda Act on females aged 10-15 years are statistically significant at the 1% level, similar to the observed impact for girls aged 5-10 years.

Appendix Table A.18 presents a more flexible specification of equation (2), replacing the $Post_{(1961-1981)}$ indicator with separate yearly effects for 1961, 1971, and 1981. The Sarda Act reduced the proportion of married females aged 10-15 years by 43.5% in 1961 relative to pre-intervention levels. The magnitude of this effect becomes larger over time, reaching 53% in 1971 and 63% in 1981, as shown in columns (1) and (2).

Columns (3) and (4) of Appendix Table A.18 present estimates using the share of married females as the outcome variable. The level effect is statistically significant and largest in 1961 when the Sarda Act reduced the proportion of married females aged 10-15 by 5.9 percentage points. The negative estimates for 1971-1981 indicate persistent effects in later years, although the magnitude becomes smaller and statistically insignificant by 1981.

Using panel data from 1911 to 1981, we find that the implementation of the Sarda Act led to substantial reductions in child marriage. Specifically, the Act reduced the proportion of married females aged 10-15 years by 51% during 1961-1981 relative to 1921 levels. These results remain robust when examining marriage rates in levels.

5.2 Effects on Female Literacy: Ages 10-15, 1911-1981

We examine medium-run effects on female literacy in response to the Sarda Act. We find an increase in the female literacy rate by 7 percentage points, presented in Appendix Table A.19.

This is consistent with our cross-sectional long-run analysis on the impact of female education. Appendix Figure A.3 shows the trajectory of literacy rate for girls in British India and princely states.

5.3 Heterogeneity within British India by proportion of married females aged 10-15 in 1911

Figure A.4 illustrates the evolution of married females aged 10-15 from 1911-1981 in British India. We compare marriage trajectories between districts with high and low proportions of married females in this age group as of 1911.[24] Districts with high initial child marriage rates in 1911 experienced steeper declines compared to those with low initial rates. This pattern suggests convergence in female child marriage rates across British India's regions over time.

5.4 Robustness

5.4.1 Dropping Princely States with Age of Marriage Laws, 1941 subsample analysis

The medium-run analysis could be confounded if post-independence India experienced time-varying factors correlated with historical British India status. To address this potential concern, we examine the law's effects using available data from the 1941 census, prior to independence. Our analysis of the Sarda Act's implementation utilizes marriage records from districts in Bengal, Bombay, Gwalior, Hyderabad, and Rajputana.

We estimate an extended baseline specification for the 1911-1941 sample:

$$y_{it} = \beta_1 BI_i \times D_{1931} + \beta_2 BI_i \times D_{1941} + \mu_i + \gamma_t + \eta X_{it} + \epsilon_{it} \tag{4}$$

where D_{1931} and D_{1941} are indicators for 1931 and 1941 (post-Sarda Act period), respectively. BI indicates British India status, and coefficients β_1 and β_2 measure the effect of the Sarda Act in 1931 and 1941 respectively. We exclude Baroda and Mysore from the sample as they implemented their own child marriage laws in 1930, prohibiting female marriages below age 14.

Appendix Table A.20 presents the implementation effects of the Sarda Act. Columns (1) and (2) report estimates using the log share of married females as the outcome variable, while columns (3) and (4) show results using levels. The Act reduced female marriage rates in 1941 by 86 percent for ages 5-10 and 40 percent for ages 10-15 relative to baseline levels. These magnitudes are comparable to the effects observed in 1961 using the full sample. The level effects range from -0.10 to -0.16 percentage points. All estimates are statistically significant at the 1 percent level and robust across specifications

In this selected sample of 75 districts, we find no differential anticipation effects for marriages of girls aged 5-10 in 1931. This absence may be attributed to increased child marriages in the princely states of Rajputana and Hyderabad following the announcement of the Sarda Act. According to the 1931 census reports, the Hyderabad Legislative Council debated passing similar

[24] Districts with high proportions are defined as those above the median proportion of ever-married females aged 10-15 among British India districts.

child marriage legislation, which received support from the Women's Association for Education Advancement but faced opposition from orthodox groups. (Census of India, 1931)[25] The reports also document a surge in child marriages in Rajputana after the Act's announcement, despite the law not being applicable to the princely states (Census of India, 1931).[26] Within this sample, the Sarda Act's treatment effect remains negative for British India districts for the 10-15 age group.

5.4.2 Accounting for Post-colonial Policies

The identification of medium-term impacts of the Sarda Act (1929) could potentially be confounded by post-colonial social policies. We adopt two approaches to mitigate potential bias from these policy confounders. First, we control for the Hindu population share in each district since many key national legislative reforms targeting women's empowerment in post-colonial India primarily affected the Hindu population. Notable examples include the Hindu Succession Act (1956, 2005), which enhanced women's inheritance rights, and the Dowry Prohibition Act (1961), which penalized dowry practices.[27] If the share of the Hindu population differs between British India districts and princely states districts, post-colonial legal changes would affect the two regions differentially. In Appendix Table A.21, we show that our medium-term impact is robust to the inclusion of the share of the Hindu population interacted with time trends. This supports that the medium-run treatment effect estimates are not capturing the effect of policies that affects the Hindu population in particular.

In our second approach, we control for state government policies implemented in India between 1947 and 1981 that could potentially impact women's age at marriage through educational incentives and marriage assistance schemes. The evolution of educational policies in India can be traced through several key phases. The Constitution of India, enacted in 1950, established an ambitious vision for universal education through Article 45, which mandated that the State provide free and compulsory education to all children up to age 14. Following this constitutional directive, states began implementing their own educational policies. A significant structural change occurred after 1975 when primary education became a joint initiative of state and central governments. This shift marked a transition toward a more coordinated and unified approach to primary education in India, combining state-level implementation with central oversight and support.

Appendix Table A.22 presents the historical evolution of compulsory primary education legislation and marriage assistance schemes across Indian states from 1947 to 1973. In Appendix Table A.23, we show that our coefficient estimate of the Sarda Act's implementation effects between 1961 and 1981 remains robust to various methods of controlling for post-colonial policies. Column (1) of Appendix Table A.23 controls for all state-level education and marriage policies tabulated in Appendix Table A.22. In Columns 2-13, we control for these policies one

[25] Census of India, 1931. Vol. XXIII: H E H the Nizam's dominions (Hyderabad State). Part I: Report
[26] Census of India, 1931. Volume XXVII, Rajputana Agency
[27] Hindus exclusively practiced dowry, while Muslims in India practiced both dowry and Mehr (bride price).

by one. The coefficient remains stable and statistically significant at the 1 percent level across all specifications.

5.5 Mechanism of Dynamics of persistence in the Medium Run

It is challenging to untangle the mechanisms underlying the persistent impact of the Child Marriage Abolition Act (1929) in post-independence India. The persistent disparities in gender outcomes between former directly British-administered districts and princely states likely stem from multiple factors interacting with the impact of the law.

One direct mechanism is potential stricter enforcement of age-of-marriage laws in post-colonial British-administered districts compared to former princely states. However, the influence of colonial reforms can extend beyond mere legal enforcement, interacting with cultural institutions in nuanced ways that create lasting differences in marriage norms. Hatekar et al. (2007) argues that there was a gradual rise in the preference for "modern" wives, a shift initially led by progressive households of high socioeconomic status who influenced families from less educated or lower socioeconomic backgrounds. In British India, the Child Marriage Abolition Act (1929) provided legitimacy to progressive families seeking social change by reducing their social costs of deviating from traditional practices. Moreover, within the context of evolving social values, laws abolishing child marriage appeared less radical, potentially creating a "magnet effect" (Aldashev et al., 2012) that accelerated changes in pre-existing traditional customs and established new social coordination points. In contrast, princely states maintained traditional marriage practices longer due to the absence of institutional pressure to alter socially acceptable marriage market norms.

Post-colonial reforms that raised the legal female age of marriage to 18 were less effective in closing the gap between British India and princely states, largely because local enforcement officials adhered to traditional norms. Anecdotal evidence suggests that some elected officials openly endorsed marriages under age 18 (Murty, 2019; Pandey, 2019), indicating that despite increased state capacity in post-colonial India, the political will to challenge entrenched local norms developed gradually. This contrasted with British administrators who, guided by values distinct from local customs, were perceived by locals as more likely to impose and implement social reforms.

Below, we test for heterogeneity in the impact of the Sarda Act to understand the relative importance of the role of culture and possible state-capacity or enforcement in the persistence of the impact over medium term.

5.6 Heterogeneity by Rural-Urban

If legal enforcement had been the primary mechanism, urban districts in British India would have shown a stronger anticipation effect than urban princely states, due to the higher presence of British colonial administrators who were expected to enforce child marriage laws. Alternatively, a higher urban population share might indicate a greater share of individuals holding modern values who were inherently more likely to comply with legislation abolishing child marriages.

Therefore, if urban share primarily proxied for modern cultural values rather than enforcement capacity, we would not observe an anticipation effect in urban districts, as these populations would have already been transitioning away from child marriage practices.

We classify districts as urban if their urban population share in 1961 is above the sample median. In Appendix Table A.24, we find that in 1931, the share of female marriages in the 10-15 age group was lower in urban districts of British India compared to urban districts of princely states. For the short-run treatment effect on the share of female marriages, the difference between the urban and rural districts is imprecise in terms of percentage change, while in level, the urban district has a smaller treatment effect (closer to zero, with the difference with that for the rural district marginally statistically significant). The results indicate that urban districts in British India show no anticipation effect and likely exhibit higher compliance with the child marriage law than urban princely state districts. This evidence suggests that the impact of the child marriage reform stemmed from a "magnet effect" (Aldashev et al., 2012) that shifted traditional customs and created new social coordination points rather than primarily from legal enforcement.

The differences in female marriages (ages 10-15) between British India and princely states for both urban and rural districts persisted from 1961 to 1981. This pattern aligns with Hatekar et al. (2007)'s hypothesis that colonial child marriage legislation created a new focal point for marriage norms in British India, which was subsequently reinforced by shifting cultural values toward modernization.

The evolution of dowry prices in marriage markets represents another potential mechanism driving differences in female marriage age. We discuss this role of dowry below.

5.7 Role of Dowry

Chiplunkar and Weaver (2023) documents a significant evolution in Indian dowry practices: while only 38% of marriages involved dowry in 1931, this proportion increased to 88.2% by the 1970s, with higher payments corresponding to higher-earning grooms. The relationship between bride's age and dowry payments has important implications for marriage age patterns. If families of older brides faced higher dowry demands, the rising trend in dowry practices during post-colonial India might have counteracted the effects of marriage age legislation, potentially driving convergence in gender outcomes between British India and princely state districts. However, if the cultural transition toward modern values occurred more rapidly in former British India districts after independence, older brides in these districts might have faced lower dowry demands compared to their counterparts in princely states. In this case, rising dowry trends could have reinforced the divergent trajectory of marriage patterns between British India and princely state districts. While this mechanism potentially explains the persistent gap in marriage age between princely states and British India districts, it does not fully account for long-term differences in female literacy. The relationship between female literacy and dowry payments remains ambiguous in the literature. Beauchamp et al. (2017) and Dalmia (2004) find that higher female education reduces women's value in the marriage market, while Behrman et al. (1999) and Maertens and Chari (2020) document that increased female education enhances it.

6 Long Run Analysis

6.1 Data

Our analysis draws on historical marriage data from the decennial census spanning 1911-2011, with gaps in 1941 and 1951. Specifically, we construct a district-level panel by combining marriage records from 1991-2011 with those from 1911-1931 and 1961-1981. This dataset documents marriage patterns for females aged 10-15 across both formerly British India and the princely states. The resulting century-long panel enables us to examine long-term differences in female marriage patterns between these two types of administrative regions.

The post-independence period is covered by several complementary datasets. The District Level Household and Facility Survey (DLHS Round 3), conducted by India's Ministry of Health and Family Welfare from 2002-2004, complements the census data by offering more precise measurements of marriage age. While the census captures only broad age group categories, the DLHS provides the mean age of marriage for women based on ceremonies conducted in the three years preceding the survey across 570 districts.[28] The National Family Health Survey (NFHS-2)[29] was conducted in 1998-1999 and provides marriage information from 90,303 women aged 15-49 years across 26 states, enabling us to document the intergenerational persistence in marriage age.

Our most recent data come from the District Information System for Education (DISE), covering 2005-2013. This system provides administrative records for school-level enrollment across India. The data capture administrative information for each school in each academic year, including gender-specific student enrollment numbers and classroom counts. Since the distinctions between princely states and British India are primarily at the district level, we aggregate the information accordingly.[30] For our analysis, we aggregate all schools within each district to determine the number of students enrolled by gender and class for each year between 2005 and 2013. This provides estimates of the male-to-female student ratio for each class in each academic year across 433 districts. On average, schools in India have 9% more boys than girls enrolled in Class 6.[31]

To account for economic and geographic variations across these periods, we include several control variables: district-level GDP per capita data from India's Planning Commission, along with geographical controls, including latitude and distance to the coast. This comprehensive dataset—combining historical census records, contemporary surveys, and administrative data—enables us to trace the evolution of marriage patterns and educational outcomes from colonial to modern India while controlling for relevant socioeconomic factors.

[28] The data are released through DevInfo 6.0 by UNICEF.

[29] The National Family Health Survey (NFHS) is a large-scale, multi-round survey conducted on a nationally representative sample of India.

[30] We exclude Karnataka from the analysis in this sample because of the lack of available data at the time of writing.

[31] This is the ratio of raw enrollment. It does not take into account the gender ratio of the population.

6.2 Empirical Strategy

We extend Equation–(2) to include an additional interaction term of BI_i and $Post_{(1991-2011)}$, where $Post_{(1991-2011)}$ is an indicator for the period 1991 to 2011. The coefficient for the interaction term estimates the long-term association between the Sarda Act and female child marriages in formerly British India districts.

Estimating the causal long-term impact of colonial legal reform presents significant challenges, as post-colonial policies may confound marriage outcomes. To address this, we employ a strategy that matches districts from British India with those from princely states. The districts are matched based on administrative borders to control for cultural and economic differences. For each British district, which may border multiple princely state districts, we create a unique set of matched paired districts using pre-treatment covariates from 1911: the share of married females (aged 5-10) and female population (aged 5-15). We selected these variables because districts with similar pre-treatment marriage patterns and female populations likely shared similar marriage practices for younger girls.

To formalize our matching procedure, we calculate percentage differences between neighboring district pairs from the two administrations. Specifically, we compute: $\Delta M_{ij} = |(M_{PS,i} - M_{BP,j})|/M_{BP,j}$ and $\Delta n_{ij} = |(n_{PS,i} - n_{BP,j})|/n_{BP,j}$. where $M_{BP,j}$ and $n_{BP,j}$ represent the marriage rate and female population of British district j in 1911, and $M_{PS,i}$ and $n_{PS,i}$ denote the same measures for neighboring princely state district i. We then construct a similarity measure between districts i, j as $S_{ij} = 0.5\Delta M_{ij} + 0.5\Delta n_{ij}$. For each British district, we select the neighboring princely state district with the minimum score S_{ij} (i.e., $\hat{i}(j) = argmin_{i(j)} S_{i(j)}$). If a princely state district is matched with a single British India district, it forms a group of districts with two units. If a princely state district is matched with more than one British India district, we combine the British India districts and the matched princely state district into a single group of districts. Following the procedure, we formed 32 groups of districts based on 56 pairs of matched British India and princely state districts.[32]

Using these matched groups, we estimate two key equations. First, to assess the long-term impact of the 1929 Child Marriage Abolition Act on marriage age, we estimate:

$$M_{db} = \sigma BI_{db} + X'_{db}\Phi + \kappa_b + \tau_{db} \tag{5}$$

M_{db} is a continuous measure of the age of marriage in 2002–2004 for district d in group b. σ is the coefficient of interest since it indicates whether female marriages occurred at a later age in former British India districts compared to the districts that were formerly under the princely states. X_{db} are the district-level controls, including latitude, distance to the coast, and log GDP per capita (in 2000). κ_b is a group fixed effect that accounts for systematic differences between groups. τ_{db} is an error term.

[32]The princely state districts are matched with replacement.

Second, to examine educational outcomes, we estimate:

$$FMR^{g}_{dbt} = \alpha BI_{db} + X'_{dt}\xi + \delta_b + \gamma_t + \mu_{dbt} \tag{6}$$

FMR^{g}_{dbt} measures the ratio of female to male students enrolled in grade g in district d of group b in year t. BI_{db} is an indicator for district d in group b, which belonged to British India before independence. α, the coefficient of interest, captures whether there was systematically more female children enrolled in school in districts that belonged to British India. δ_b is the group fixed effect, which accounts for systematic differences between groups, such as gender ratio, unobserved gender bias in social norms, and the provision of schools. X_{dt} are district-level controls, which include the proportion of rural schools in district d, the average number of classrooms in schools in district d, log GDP per capita (in 2000), latitude, and distance to the coast. We also control for the ratio of female to male students enrolled in class 1 in year t, which measures contemporary labor market conditions that affected the enrollment ratio of children in grade 1.[33] γ_t is a year-fixed effect that controls for yearly gender differences in school enrollment. In additional specifications, we further control for the group-year fixed effects. μ_{dbt} is an error term.[34]

6.3 Results

6.3.1 Long-Run Panel: 1911-2011

Next, we present the evolution of the long-term effects of the Sarda Act using the decennial census for the period 1911–2011. In Figure 4, the percentage change in the treatment effect on females married at ages 10–15 increases until 1981, remains stable for a decade, and shrinks thereafter. Table 5 shows three effects: the anticipation effect in 1931 on the marriage of girls aged 10–15, a 52 percent decline in marriages during the period 1961–1981, and a 27.8 percent decline in marriages of girls aged 10–15 during the period 1991–2011.

6.3.2 Mean age of marriage

In Table 6, we report the persistent effects of the implementation of the Sarda Act in the long run, using a matched difference-in-differences design, for which we match districts bordering princely states and British provinces using the proportion of married females and female population in the age group 5-10 years in 1911. We find that in the long run, the mean age of marriage increases in British India. Column (1) of Table 6 shows the mean age of marriage rises by 0.45 years in British India after controlling for fixed effects for groups of matched districts. In column (2) of Table 6, we find that the results remain robust after additionally controlling for economic covariates.

6.3.3 Schooling Outcomes

In Table 7, we report the results for equation (6) estimated for each class from 4 to 7. Comparing across columns, it is clear that the gender enrollment ratio begins to differ in grades 4, 5, 6,

[33] The minimum age class 1 student in India 6 years.
[34] All standard errors are clustered at the group level.

and 7 when the decision to attend school becomes more closely related to a human capital investment decision beyond basic literacy. The estimate for class 7 (Column 1) suggests that in British districts, on average, 3.54 more girls enrolled in school per 100 enrolled boys compared to the princely state districts. The magnitudes of the coefficients increase with higher grades. This suggests that class 5 is a critical time: if girls drop out of school during this period, they may not return, whereas those who continue their education from this point are about as likely to proceed as boys.

6.4 Long Run Persistence: Mechanisms

The persistent gender-outcome gap between British India and the princely states may be shaped by multiple factors that emerged after colonial rule. These include varying levels of economic development and the interaction between formal institutions and informal cultural constraints. While causal identification of the mechanisms underlying these long-run equilibrium outcomes remains empirically challenging, we provide suggestive evidence of several potential channels that may help explain the enduring disparities in gender outcomes.

6.4.1 Historical Marriage Age and Contemporary differences in Mean Age of Marriage

We estimate the following extension of regression specification Eq-5 to test whether historical marriage rates in 1931 explain the persistence of differences in marriage outcomes:

$$M_{db} = \sigma_{\tilde{t}} BI + X'_{bd}\Phi + \beta_{\tilde{t}} m_{\tilde{t}} + \kappa_b + \epsilon_{bd}$$

where M_{db} is the female marriage age measured in 2002-2004. The equation controls for the female marriage rate at ages 10-15 calculated using census data[35] for a given census year $\tilde{t}$, $m^{\tilde{t}}$. We conduct separate regressions incorporating the marriage rate from each decadal census year $\tilde{t}$ as a control, where $\tilde{t}$ spans 1911-1931 and 1961-1981. Each regression controls for the marriage rate at ages 10-15 for the given census year ($m_{\tilde{t}}$).

Following Bleakley and Lin (2012), we report the coefficient ratio $\frac{\sigma_{\tilde{t}}}{\sigma}$, where σ is the coefficient estimate from Equation 5–the baseline long-run specification with group fixed effects (δ_b) that estimates the impact on mean marriage age without controlling for historical female marriage rates. If the marriage rate at year $\tilde{t}$ explains the difference in female marriage age in year t, then we would expect the coefficient $\sigma_{\tilde{t}}$ to be close to zero, making the ratio of conditional to unconditional coefficients also approach zero. Conversely, if historical marriage rates do not explain the differences in marriage age in the long run, we expect the ratio of coefficients to be close to one.

In Figure A.5, we find that historical marriage rates start having explanatory power on the contemporary differences in mean age of marriage between British India and princely states from 1931 onwards. This suggests that the divergence between the two regions coincides with the implementation of the Sarda Act, instead of being driven by historical patterns between the

[35] It is the same measure we used in the short-run and medium-run analysis with census data.

two regions that existed before the Sarda Act. The estimates are noisy because we have been able to match only a subset of districts from the long-run estimation sample for every census year.

6.4.2 Migration and Interpretation of Long-Term Effects

The association between colonial-era administrative boundaries and long-run gender outcomes could potentially be attributed to the sorting of individuals. While post-colonial sorting does not impact the identification strategy, which relies on parallel pre-trends in outcomes, it affects the interpretation of the persistent effects of the Child Marriage Abolition Act (1929). Population mobility — or its absence — shapes whether observed differences in gender outcomes can be attributed to location-specific institutional legacies or the persistence of cultural norms of the population.

Munshi and Rosenzweig (2016) provide evidence on the prevalence of *low level* male rural-to-urban and urban-to-urban migration in postcolonial India compared to countries of similar size and levels of economic development. It argues that economic benefits derived from income insurance provided by social networks is one of the reasons for males not *permanently* migrating away from their native villages. Evidence from Kone et al. (2018) documents striking spatial constraints on internal population movements in India. Cross-district mobility is particularly constrained, with only 2.8% of the population moving across district boundaries. This rate stands in marked contrast to other large developing and developed economies: Brazil records cross-district migration of 9.1%, China approximately 9.8%, and the United States exhibits rates near 20%. The spatial friction becomes even more pronounced at the state level, where India's inter-state migration rate barely exceeds 1% of the population. This limited mobility has important implications for understanding how colonial-era administrative boundaries continue to shape gender outcomes through both institutional and cultural channels.

The intergenerational transmission of marriage-age norms could possibly be one of such cultural channels. We use data from the National Family Health Survey (NFHS-2, 1998–1999). We analyze subsamples of girls 10 to 18 years old. Our outcome of interest is whether the girl is unmarried at the time of the interview. That is, we compare the marriage outcome of girls of the same age whose mothers differ in their age at first marriage, controlling for relevant mother and household level characteristics.[36] Appendix Table A.25 provides suggestive evidence of the transmission of marriage norms from mothers to daughters. We find that the probability that girls 10 to 18 years old are unmarried is positively correlated with the age at first marriage of their mothers. The correlation is statistically significant at the 1% level but small in magnitude.

The intergenerational transmission can operate through multiple pathways. First, Asadullah and Wahhaj (2019) shows that early marriages are associated with traditional gender roles and gender-biased resource allocation. This cultural transmission of gender values is further supported by Farré and Vella (2013), who demonstrate that mothers' attitudes towards labor force participation positively correlate with their daughters'. Second, fertility patterns play

[36]The survey covers 90,303 women aged 15-49 years from 26 states.

a crucial role — Mensch et al. (1998) finds that young brides face greater pressure to bear children and experience higher child mortality, potentially affecting family size and resource allocation. This fertility channel is affected by sibling competition in the marriage market, as Vogl (2013) finds that older daughters may marry sooner if they have a younger sister. Third, the educational pathway is evident in studies by Sekhri and Debnath (2014) and Chari et al. (2017), which demonstrate that delaying mothers' age of marriage leads to improved education and health outcomes for their children, creating a virtuous cycle of delayed marriage across generations.

7 Conclusion

This paper examines the impact of colonial legal reform on gender outcomes in India, focusing on the Child Marriage Restraint Act (Sarda Act) of 1929. Using historical census data (1911-1931), we show that the announcement of the law initially generated an adverse response in British India relative to princely states, with increased marriages of girls aged 5-10 years as families sought to circumvent the impending restrictions. These short-term effects are robust to region-specific trends, population trends, placebo checks, alternative methods of inference, and balance tests. The results remain consistent when examining broader colonial samples and are not confounded by age misreporting, sex-ratio heterogeneity, or population sorting.

The initial adverse response was followed by substantial and sustained declines in female child marriage (ages 10-15 years) during the medium term (1911-1981). These medium-term effects persist after accounting for post-colonial policies and remain robust when excluding princely state districts (i.e., control group districts) that implemented similar child marriage laws after 1930.

Through matched comparisons of neighboring British India and princely state districts, we systematically document better gender outcomes in former British India districts that persist into contemporary periods, as evidenced by later marriage ages and higher female educational enrollment at secondary school levels. Limited internal migration in post-colonial India suggests that both institutional legacies and cultural norms contribute to these enduring differences.

The temporal evolution from short-term backlash to long-term compliance highlights the importance of extended time horizons when evaluating interventions targeting deep-rooted cultural practices. This research advances our understanding of how colonial institutions shape contemporary gender outcomes through both formal institutional channels and informal cultural mechanisms. Future research should explore the specific pathways through which colonial legal reforms influence modern gender outcomes.

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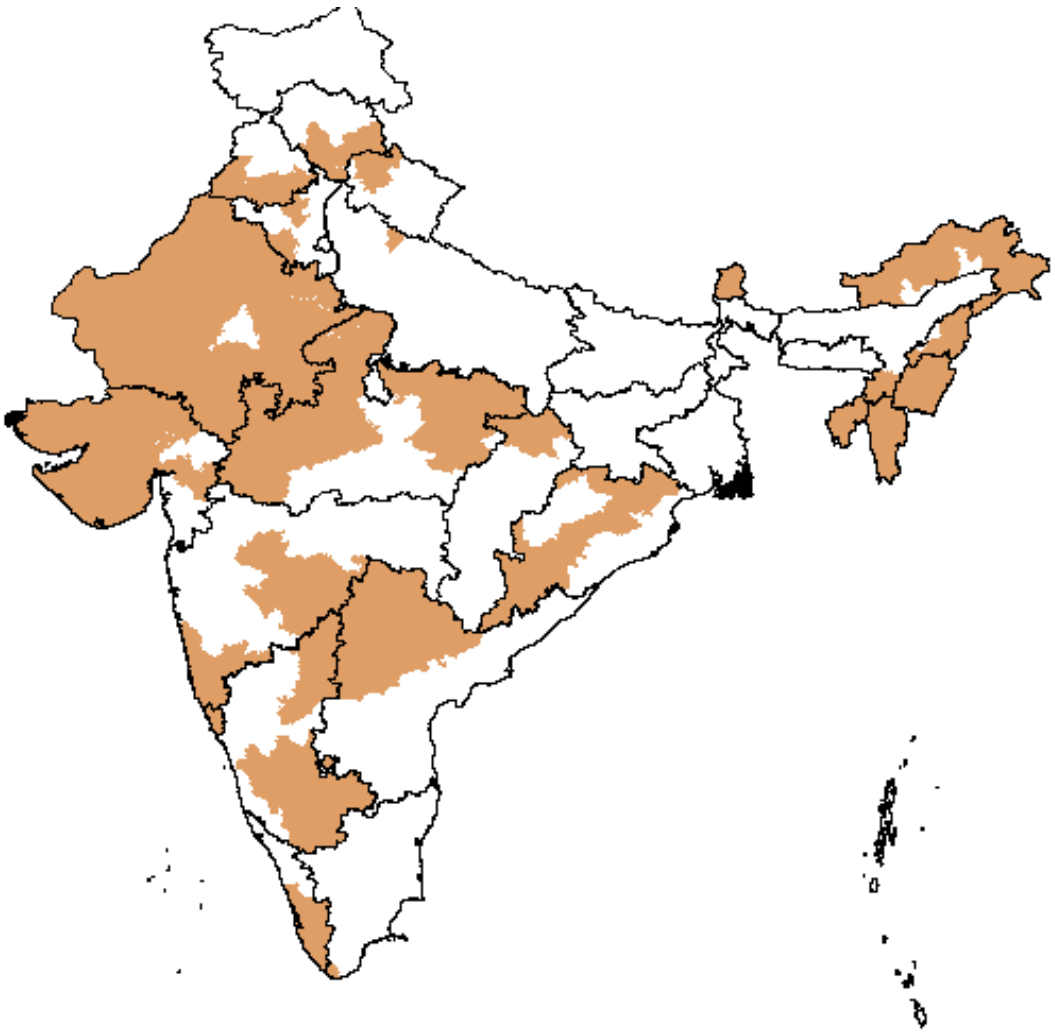
8 Figures and Tables

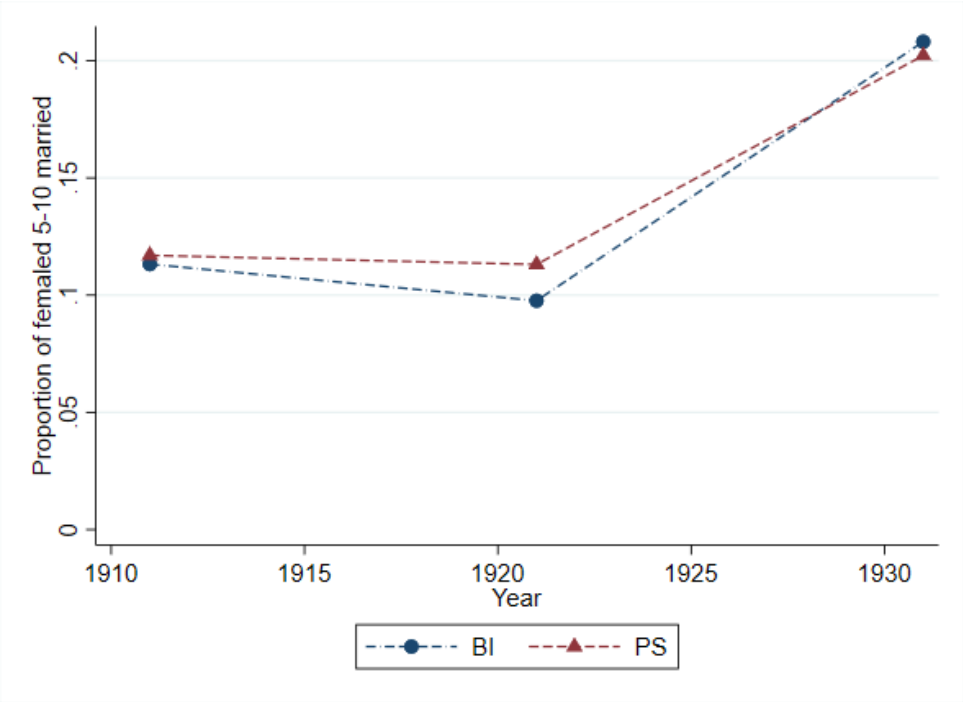
Figure 1: Distribution of Princely States and British Direct Rule Regions



Note: The figure plots the geographical distribution of districts formerly belonging to British India and the princely states in India. The shaded parts were districts that belonged to princely states, and the white parts were districts that were under British India. The solid line is the state boundary in post-colonial India. Sources: Baden-Powell (1892) and Census of India (2011).

Figure 2: Female Marriage Pattern in 1911-1931, by British India and Princely States

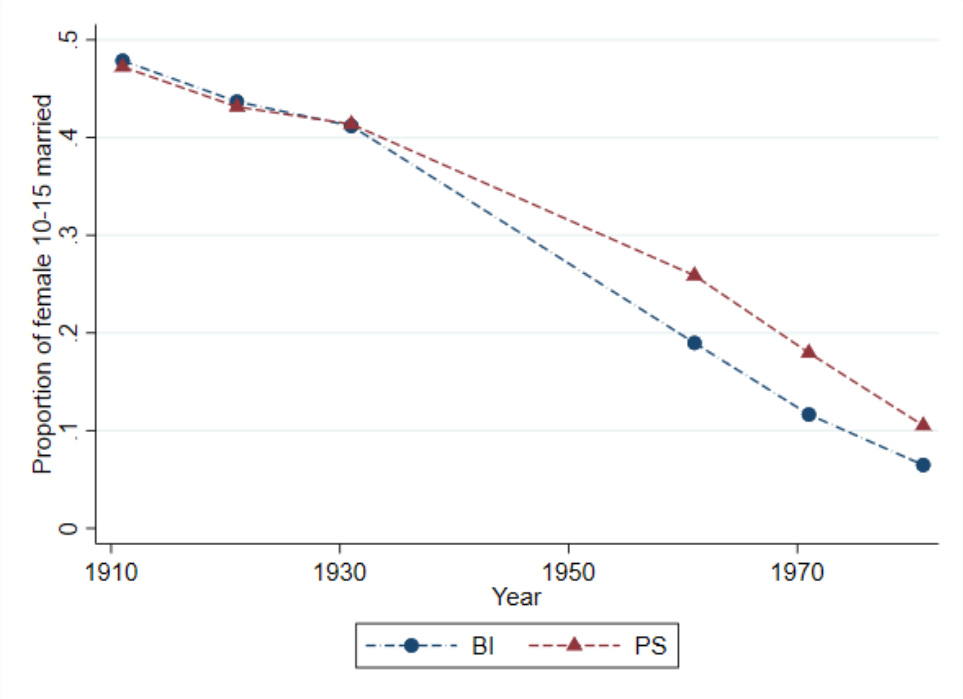
(a) Married proportion 5-10



Note: The graph shows the proportion of married females by district in our sample across census years. Specifically, it displays the percentage of girls married between ages 5-10 from 1911-1931, comparing districts in British India with those in princely states. The data comes from the Census of India (1911-1931). Our analysis reveals no statistically significant differences between British India and princely states in marriage trends from 1911-1921 for females aged 5-10, 10-15, and 15-20 years (see Table 1).

Figure 3: Female Marriage Pattern in 1911-1981, by British India and Princely States

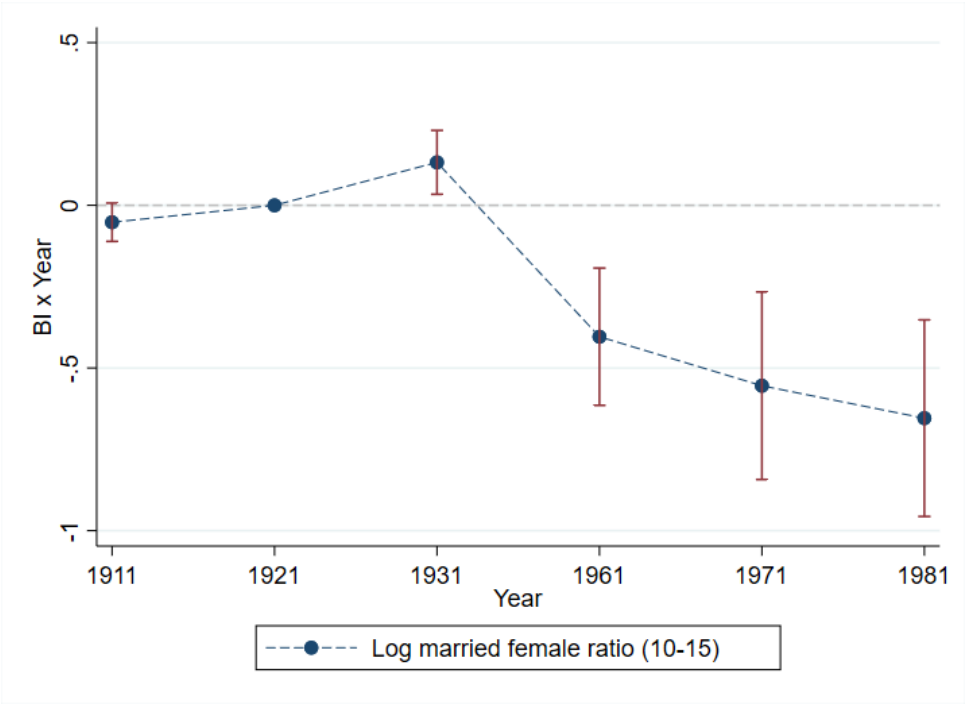
(a) Married proportion 10-15



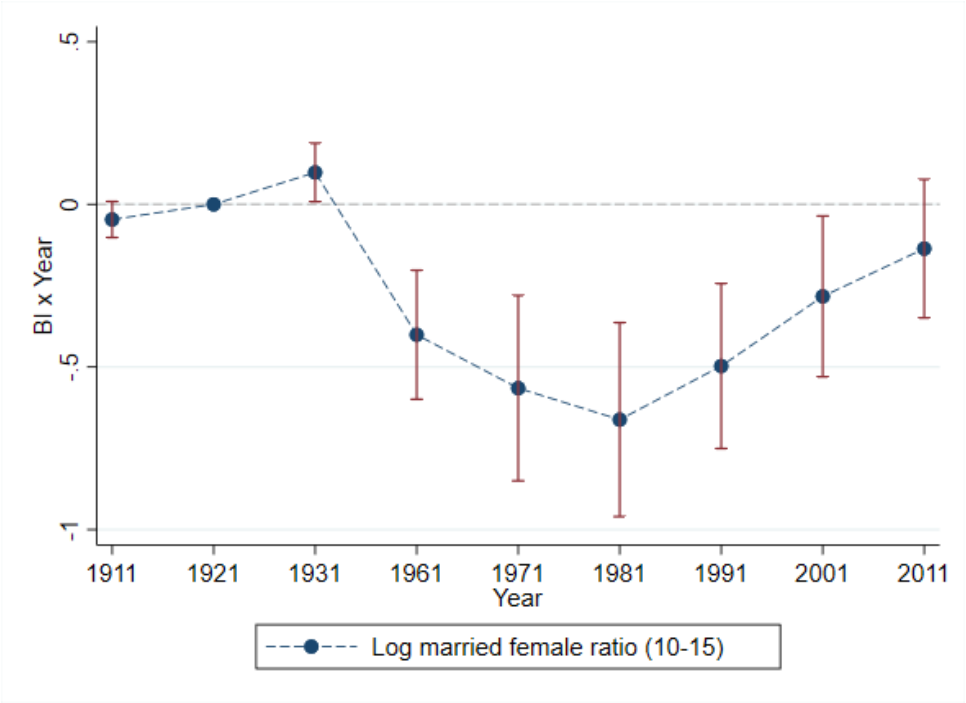
Note: The graph plots the proportion of females married in each census year at the district level in our sample. The figure plots the proportion of females married at ages 10-15 years for the period 1911-1981 for the sample of districts where the districts could be linked between 1931 and 1981 by British India and princely states. The blue lines represent British India, and the red lines are for princely states. Data are from the Census of India 1911-1931 and 1961-1981. We do not find any statistically significant difference in the trends, from 1911-1921, between British India and princely states for the proportion of females married at ages 10-15.

Figure 4: Medium-run and Long run Impact of Sarda Act, 1930

(a) ln - Share of female married 10-15 (Medium run, 1911-1961)



(b) ln - Share of female married 10-15 (Long run, 1911-1981)



Note: The figures plot the coefficient $BI \times year_t$ where BI is an indicator for the British India district, and $year_t$ is the year indicator, for equation (2) replacing the $Post_t$ indicator with yearly indicators. Panel (a) uses the data from 1911-1961. The specification is the same as column (1) in Table A.18. Panel (b) uses data from 1911 to 1981. Both specifications exclude 1941 and 1951. The omitted year is 1921.

Table 1: Short-Run Difference-in-Differences - Test of Parallel Trend

(a) ln Share of Female Married

	Age 5-10	
	(1)	(2)
BI × Year 1921	-0.0425	-0.0920
	(0.0750)	(0.0729)
	Age 10-15	
BI × Year 1921	0.00419	-0.0228
	(0.0199)	(0.0276)
	Age 15-20	
BI × Year 1921	-0.000262	0.00604
	(0.00526)	(0.00779)
Observations	511	511
Number of Districts	259	259
Year FE	Y	Y
District FE	Y	Y
Ln pop. (1911) x year trend	Y	Y
Prov. trend	N	Y

(b) Share of Female Married 5-10

	Age 5-10	
	(1)	(2)
BI × Year 1921	0.00216	-0.00774
	(0.00830)	(0.00508)
	Age 10-15	
BI × Year 1921	0.00623	-0.0144
	(0.00700)	(0.00951)
	Age 15-20	
BI × Year 1921	-0.000133	0.00474
	(0.00419)	(0.00593)
Observations	511	511
Number of Districts	259	259
Year FE	Y	Y
District FE	Y	Y
Ln pop. (1911) x year trend	Y	Y
Prov. trend	N	Y

Note: This table tests the parallel trend assumption for equation (1) using district-level panel data from 1911-1921. Instead of D_{1931}, we use an indicator for the year 1921. BI denotes districts in British India, and the interaction term $BI\times$ Year 1921 tests for differential trends between British India districts and princely states during 1911-1921. The dependent variable in panel A is the log of the female marriage rate, while panel B uses the female married rate. Both panels examine three age groups: 5-10, 10-15, and 15-20 years. Control variables include the log of total population for the relevant age group: 10-15 years for outcomes at ages 5-10 and 15-20, or 15-20 years for outcomes at age 10-15. The analysis uses historical region definitions from the Census of India (1911-1931) and includes Assam, Baroda, Bengal, Bihar and Orissa, Bombay, CIA, CP, Gwalior, Hyderabad, Madras, Punjab, Rajputana, and UP. Mysore is excluded from the sample. We cluster standard errors at the district level, and statistical significance is indicated by *, **, *** for the 10%, 5%, and 1% levels, respectively.

Table 2: Short-Run Difference-in-Differences

(a) ln Share of Female Married

	Age 5-10			
	(1)	(2)	(3)	(4)
BI × Year 1931	0.179**	0.184*	0.246***	0.229*
	(0.0743)	(0.109)	(0.0937)	(0.118)
	Age 10-15			
BI × Year 1931	0.0591**	0.0303	0.0801**	0.0524
	(0.0280)	(0.0385)	(0.0352)	(0.0438)
	Age 15-20			
BI × Year 1931	0.0346***	0.0214**	0.0466***	0.0339***
	(0.00843)	(0.0109)	(0.0115)	(0.0126)
Observations	856	856	757	757
Number of Districts	337	337	259	259
Year FE	Y	Y	Y	Y
District FE	Y	Y	Y	Y
Incl. Mysore	N	N	N	N
Region. trend	N	Y	N	Y
Ln pop. (1911) x year trend	N	N	Y	Y

(b) Share of Female Married 5-10

	Age 5-10			
	(1)	(2)	(3)	(4)
BI × Year 1931	0.0154*	0.0197**	0.0132	0.0230**
	(0.00897)	(0.00890)	(0.0110)	(0.0105)
	Age 10-15			
BI × Year 1931	0.0165*	-0.000263	0.0176	-0.000131
	(0.00997)	(0.0125)	(0.0120)	(0.0145)
	Age 15-20			
BI × Year 1931	0.0227***	0.0124	0.0297***	0.0204**
	(0.00588)	(0.00768)	(0.00731)	(0.00875)
Observations	856	856	757	757
Number of Districts	337	337	259	259
Year FE	Y	Y	Y	Y
District FE	Y	Y	Y	Y
Incl. Mysore	N	N	N	N
Ln pop. (1911) x year trend	N	N	Y	Y
Region. trend	N	Y	N	Y

Note: This table estimates equation (1) with additional controls using district-level panel data from 1911-1931. The dependent variable is the share of females married at age 5-10 years, expressed as logs in panel (a) and levels in panel (b). *BI* indicates districts under British India, and Year 1931 indicates observations from 1931. All columns control for log total population of the relevant age group (10-15 years for outcomes at ages 5-10 and 15-20; 15-20 years for outcomes at age 10-15). Column (2) adds region-specific year trends, column (3) adds an interaction between 1911 log population (age 10-15) and year trends, and column (4) includes both additional controls from columns (2) and (3). The analysis uses historical region definitions from the Census of India (1911-1931) and includes districts that are now part of India from the following historical regions: Assam, Baroda, Bengal, Bihar and Orissa, Bombay, Central India Agencies, Central Provinces, Gwalior, Hyderabad, Madras, Punjab, Rajputana, and United Provinces. Mysore is excluded from the sample. Standard errors are clustered at the district level, with *, **, *** indicating significance at 10%, 5%, and 1% levels respectively.

Table 3: Medium-Run Difference-in-Differences

	ln Share of Female Married 10-15	Share of Female Married 10-15
	(1)	(2)
BI × Year 1931	0.157***	0.0145
	(0.0511)	(0.0123)
BI × Post (1961-1981)	-0.507***	-0.0483**
	(0.130)	(0.0236)
Observations	1513	1513
Number of Districts	285	285
Year FE	Y	Y
District FE	Y	Y

Note: This table estimates equation (2) using district-level panel data from two periods: 1911-1931 and 1961-1981. The dependent variable is the share of females married at age 10-15 years, expressed as logs in column (1) and levels in column (3). BI indicates districts under British India, 1931 indicates observations from 1931, and $Post(1961-1981)$ indicates observations from the period 1961-1981. All specifications control for the log male population aged 10-15 years. The analysis includes districts from Assam, Baroda, Bengal, Bihar and Orissa, Bombay, Central India Agency, Central Provinces, Hyderabad, Madras, Punjab, Rajputana, United Province, and Mysore. Standard errors are clustered at the district level, with *, **, *** indicating significance at 10%, 5%, and 1% levels respectively.

Table 4: Medium-run Difference-in-Differences - Test of Parallel Trend

	ln Share of Married Female 10-15	Share of Married Female 10-15
	(1)	(2)
BI × Year 1921	0.0253	0.00856
	(0.0218)	(0.00718)
Observations	486	486
Number of Districts	249	249
Year FE	Y	Y
District FE	Y	Y
Incl. Mysore	Y	Y

Note: The table tests the parallel trends assumption for equation (2) by examining differences between British India and princely states from 1911 to 1921. The analysis replaces indicators for 1931 and post with an indicator for 1921. The interaction term $BI\times$ Year (1921) tests whether districts in British India exhibited different trends from those in princely states during this pre-treatment period. The analysis uses district-level panel data from 1911-1921. Column (1) presents the share of females married aged 10-15 years (in logs), while column (3) shows the share in levels. All specifications control for male population (in logs) aged 10-15 years. The sample covers districts in Assam, Baroda, Bengal, Bihar and Orissa, Bombay, Central India Agency, Central Provinces, Hyderabad, Madras, Punjab, Rajputana, United Provinces, and Mysore. Due to missing data for some districts in 1911-1921, the sample size differs from Table 3. Standard errors are clustered at the district level, with *, **, and *** denoting significance at 10%, 5%, and 1% respectively.

Table 5: Long-Run Difference-in-Differences

	ln Female Married Share 10-15	Female Married Share 10-15
	(1)	(2)
BI × Year 1931	0.121***	0.00675
	(0.0464)	(0.0124)
BI × Post (1961-1981)	-0.515***	-0.0530**
	(0.127)	(0.0242)
BI × Post (1991-2011)	-0.278**	-0.00570
	(0.110)	(0.0274)
Observations	2197	2197
Number of districts	285	285
Year FE	Y	Y
District FE	Y	Y
Incl. Mysore	Y	Y

Note: This table estimates equation (2) using district-level panel data spanning two periods: 1911-1931 and 1961-2011. Column (1) shows results for the share of females married aged 10-15 years (in logs), while column (3) presents the share in levels. The key variables are: BI, an indicator for districts under British India; $SardaAct$, an indicator for the year 1931; and $Post$, an indicator for 1961-1981. All specifications control for male population (in logs) aged 10-15 years. The sample includes districts from Assam, Baroda, Bengal, Bihar and Orissa, Bombay, Central India Agency, Central Provinces, Hyderabad, Madras, Punjab, Rajputana, United Provinces, and Mysore. Standard errors are clustered at the district level, with *, **, and *** denoting significance at 10%, 5%, and 1% respectively.

Table 6: Long-Run Effect - Mean Age of Marriage

Outcome:	Mean age of marriage	
	(1)	(2)
BP	0.452*	0.423*
	(0.233)	(0.223)
Observations	67	64
Mean	19.51	19.49
Group FE	Y	Y
Economic controls	N	Y

Note: This table estimates equation (5) using data from UNICEF DevInfo's District Level Household Survey (DLHS) 2002-2004. The dependent variable is the district-level mean age at marriage. *BI* indicates whether a district was formerly under British India. Column (1) controls for geographic characteristics (distance to coast and latitude), while column (2) adds the log of GDP per capita (2000). Robust standard errors are shown in parentheses, with *, **, and *** denoting significance at 10%, 5%, and 1% respectively.

Table 7: OLS Regression of Girl / Boy Enrollment Ratio: 2005-2013

	Outcome: Ratio of girl/boy enrollment			
	Class 7	Class 6	Class 5	Class 4
	(1)	(2)	(3)	(4)
BI	0.0354**	0.0322*	0.0239**	0.0113
	(0.0158)	(0.0170)	(0.0106)	(0.00895)
Controls	Y	Y	Y	Y
Group FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
	(1)	(2)	(3)	(4)
BI	0.0302	0.0320*	0.0197	0.00376
	(0.0185)	(0.0181)	(0.0119)	(0.0100)
Observations	2272	2272	2272	2272
Controls	Y	Y	Y	Y
Group × Year FE	Y	Y	Y	Y

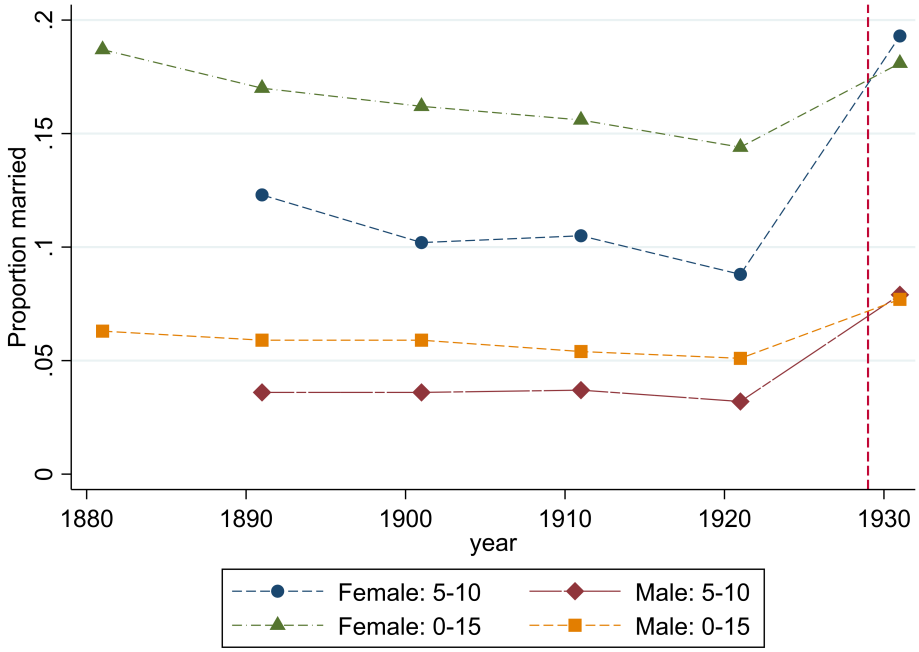
Note: This table estimates equation (6) for grades 4-7 during 2005-2013. The dependent variable is the girl-to-boy enrollment ratio at the district-year-grade level. *BI* indicates whether a district was formerly under British India. The specifications control for the girl-to-boy enrollment ratio in grade 1, the share of rural schools, the average number of classrooms, geographic characteristics (latitude and distance to coast), and district GDP per capita (in logs) measured in 2000. Standard errors are clustered at the district level, with *, **, and *** denoting significance at 10%, 5%, and 1%, respectively.

Appendix

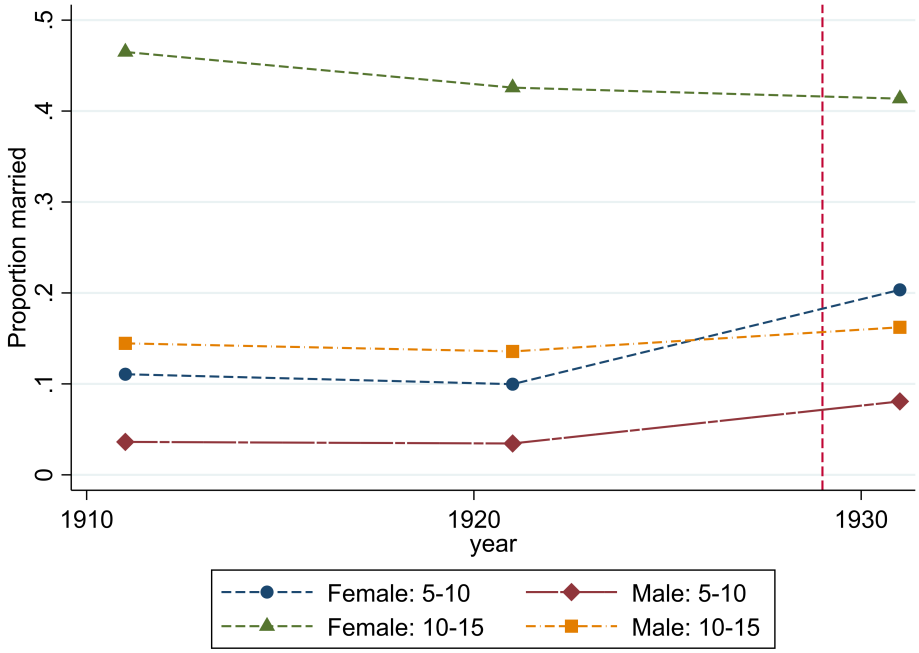
A Additional Figures and Tables

Figure A.1: Marriage Pattern in 1881-1931: Time Series

(a) National trend



(b) Our sample

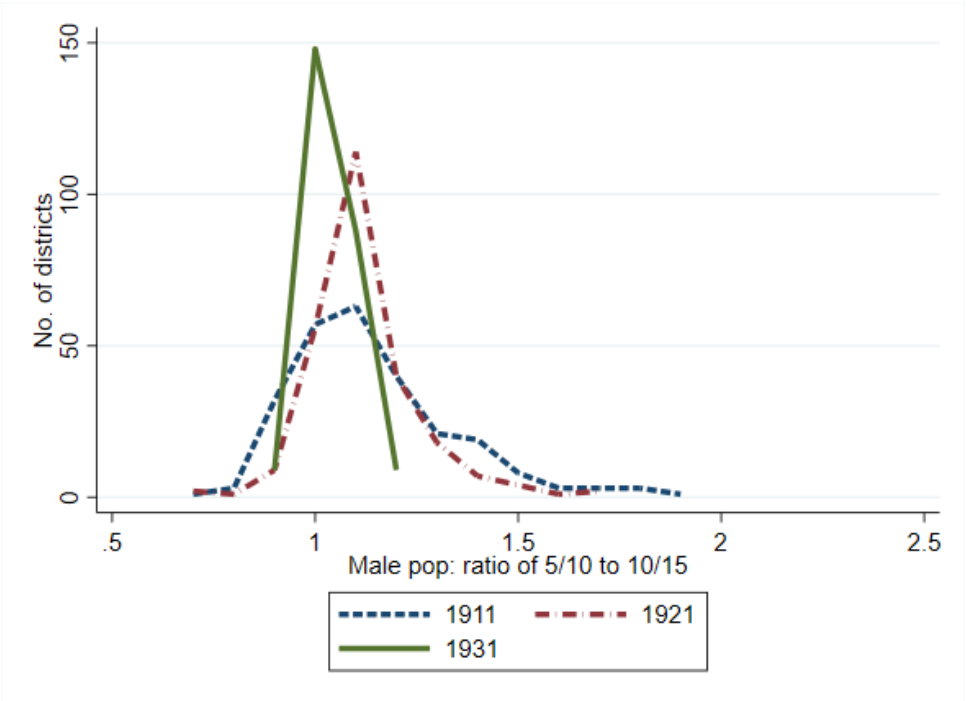


Note: The figure shows the prevalence of child marriage in India from 1881 to 1931, based on census data collected every 10 years. For each gender and age group, we calculate the marriage rate by dividing the total number of married children (including those widowed) by the total number of children in that demographic category. Panel (a) displays national-level marriage rates for children aged 5-10 years and 0-15 years, separated by gender. Panel (b) presents district-level averages of child marriage rates for two age groups (5-10 years and 10-15 years) across our sample districts in each census year. The data source is the Census of India (1881-1931).

Figure A.2: Age Structure in Census of India for 1911-1931

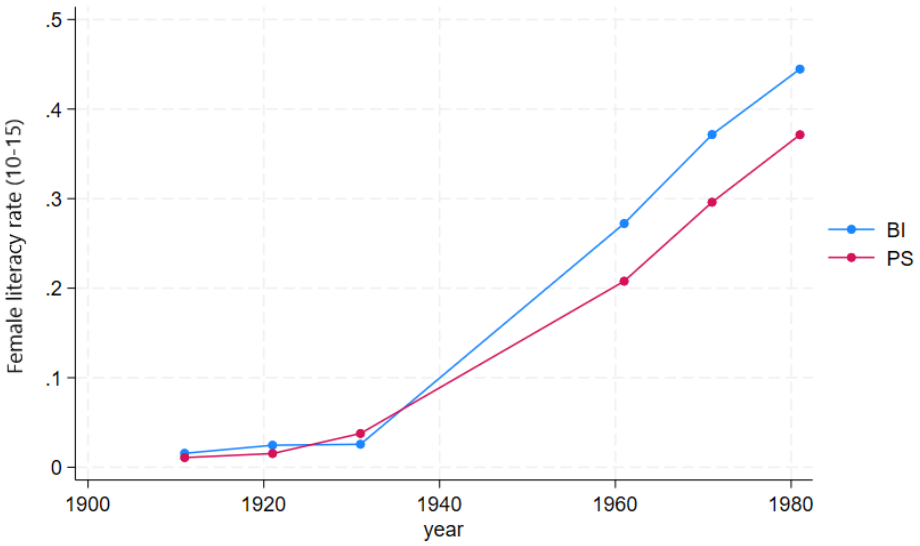
(a) Girls

(b) Boys



Note: The graph shows how age distributions varied across districts in India according to Census data from 1911-1931. Using histograms, it displays the ratio of children aged 5-10 to those aged 10-15 in each district, separated by gender. Panel (a) presents the age structure for girls across districts, while Panel (b) shows the same ratio for boys. The x-axis represents different ratio values (bins), and the y-axis shows how many districts fall into each bin. This visualization helps identify patterns in the reported age structure at the district level.

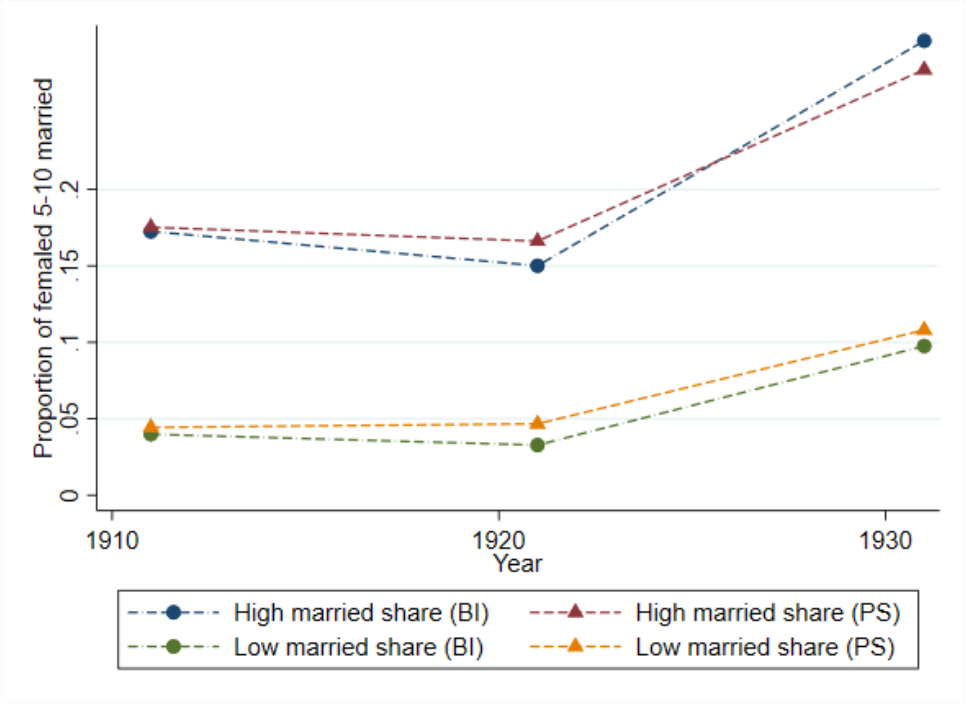
Figure A.3: Literacy Rate of Girls in Ages 10-15



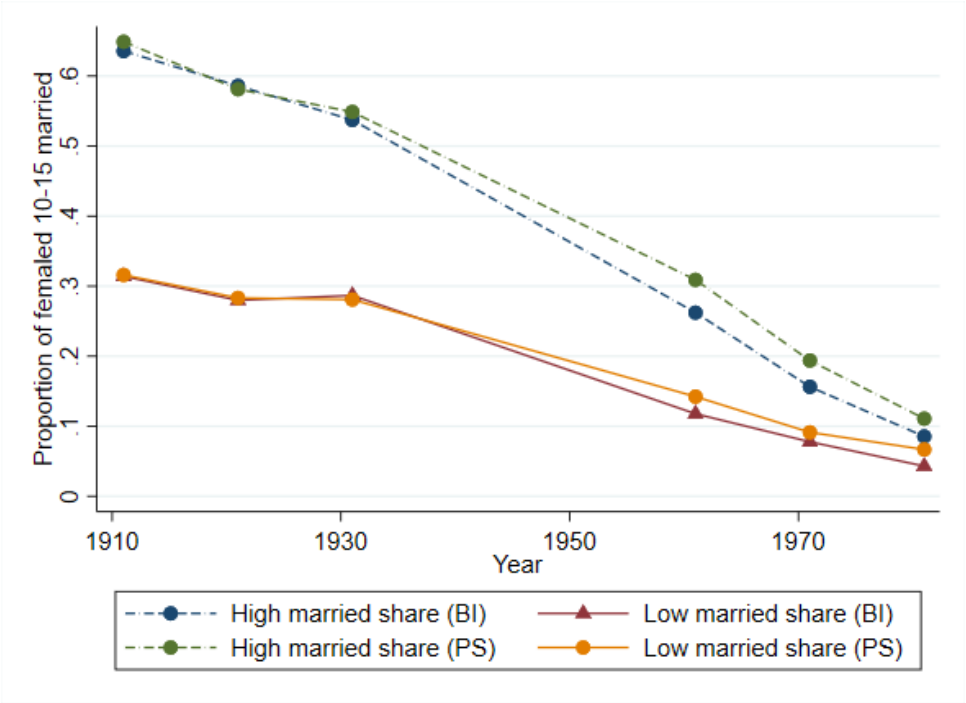
Note: The graph shows the trajectory of literacy rate of girls in aged 10-15.

Figure A.4: Female marriage pattern in 1911-1981 by high versus low year 1911 share of female married in ages 10-15

(a) Female 10-15

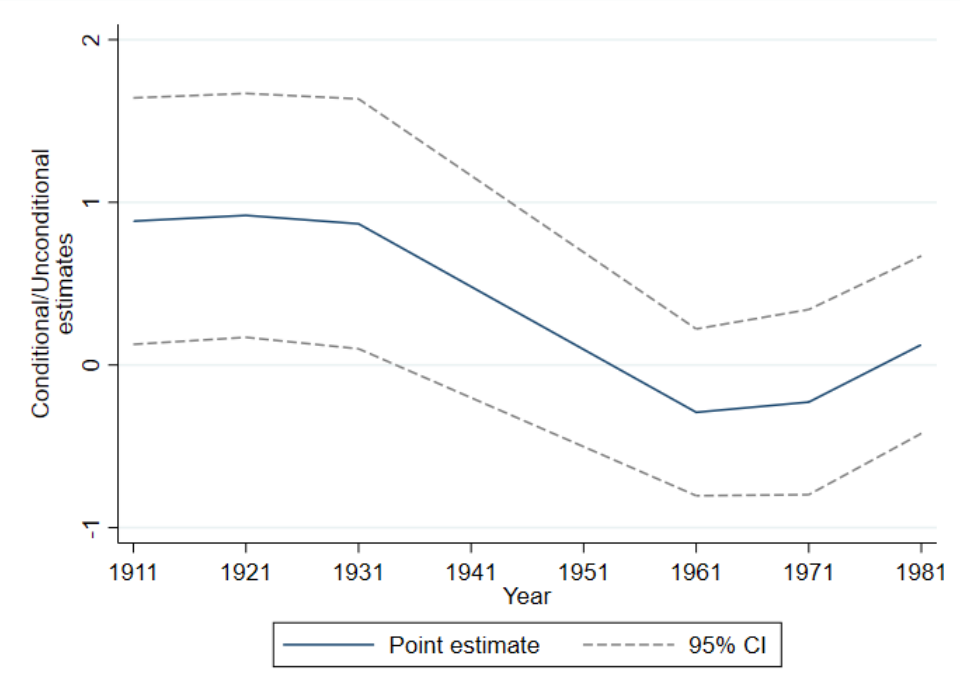


(b) Female 5-10



Note: The figure compares child marriage rates for females across districts in British India and princely states, focusing on two age groups: 5-10 years and 10-15 years. Districts are categorized based on whether their female marriage rates in 1911 were above or below the median. The data is shown for each census year, allowing us to track how marriage rates evolved in districts with initially high versus low levels of child marriage, across both British-administered territories and princely states.

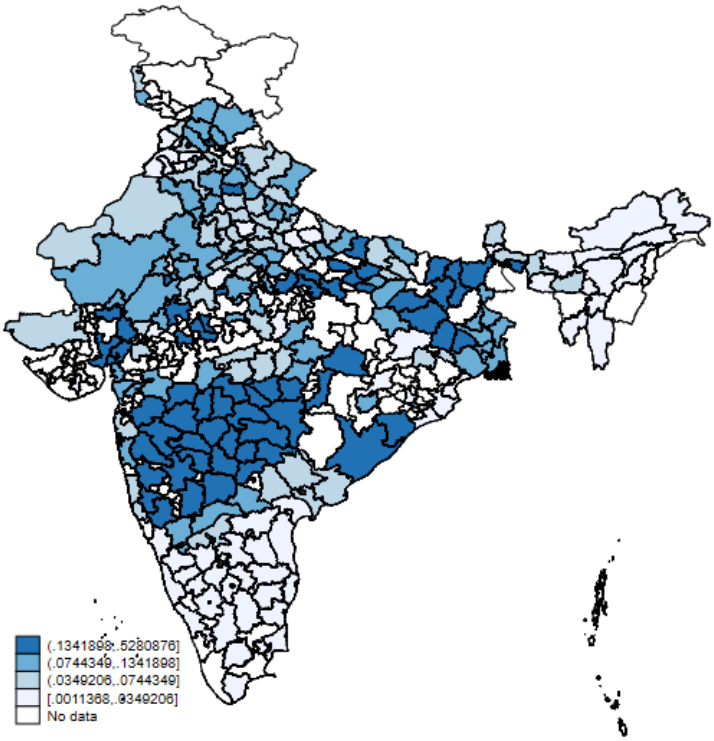
Figure A.5: Long run marriage regression - conditional on historical marriage level of 10-15



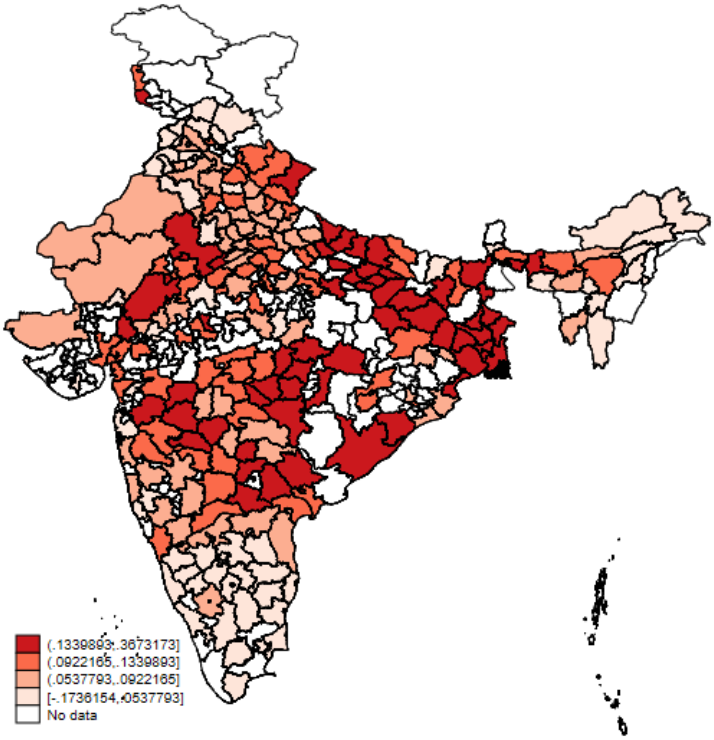
Notes: The figure plots the ratio of coefficients of the long-run marriage regression with group fixed effects, and that conditional on the marriage rate of females aged 10-15 at each of the years in the historical census.

Figure A.6: Proportion of married female at age 5-10 in 1921 and 1931

(a) Proportion of married female at age 5- 10 (%): 1921



(b) Change between 1921 and 1931 in proportion of married female at age 5- 10



Note: The figure maps child marriage rates across Indian districts between 1921-1931, using 1931 district boundaries from MLInfo. Panel (a) displays the district-level marriage rates for females aged 5-10 years in 1921. Panel (b) shows how these marriage rates changed between 1921 and 1931, measured as the absolute difference between these two years. The data are drawn from the Census of India for 1921 and 1931.

Table A.1: Married Share of Females Aged 5-10 Years in 1911 and 1931, by Historical Province

Married Share: 5-10 female			
Year	1911	1921	1931
Assam	0.02	0.01	0.07
Baroda	0.15	0.08	0.14
Bengal	0.11	0.08	0.27
Bihar and Orissa	0.17	0.13	0.26
Bombay	0.18	0.15	0.24
CIA	0.14	.	0.23
Central Province	0.16	0.14	0.29
Gwalior	.	0.12	0.21
Hyderabad	0.24	0.21	0.36
Madras	0.04	0.04	0.09
Mysore	0.01	0.01	0.04
Punjab	0.07	0.08	0.13
Rajputana	0.07	0.08	0.18
United Province	0.10	0.10	0.23
All	0.11	0.10	0.20

Note: The table shows child marriage rates by region for 1921 and 1931. For each region in our sample, we calculate the marriage rate for females aged 5-10 years by dividing the number of married and widowed females by the total female population in this age group at the district level. All data are sourced from the Census of India 1911-1931.

Table A.2: Summary Statistics - British India and the Princely States

	British India	Princely states
	Mean	Mean
District level characteristics		
Distance to coast (km)	479.2	388.2
Ln GDPPC (2000)	2.585	2.844
Manufacturing share of GDP (2000)	0.102	0.111
School characteristics		
Total girl / total boy enrollment in class 6	0.935	0.913
Total girl / total boy enrollment in class 5	0.939	0.923
Proportion of rural schools	0.883	0.869
Number of classrooms	4.415	5.023

Note: The table presents summary statistics for our sample analyzed in Section 6. The top panel shows district level variables: Log district level GDP per capita is measured in the year 2000. Distance to coast is measured in kilometers from the centroid of each district. The bottom panel presents data aggregated at district level from DISE school records, forming a district-level (unbalanced) panel for 2005-2013. The sample does not include Kerala.

Table A.3: Short-Run Difference-in-Differences - Male aged 15-20

(a) Log of Marriage Rate for Males Aged 15-20 Years

	Log of Marriage Rate for Males Aged 15-20 Years			
	(1)	(2)	(3)	(4)
BI × SardaAct (1931)	0.0389	0.0366	0.0327	0.0493
	(0.0281)	(0.0342)	(0.0350)	(0.0397)
Observations	855	855	756	756
Number of Districts	337	337	259	259
Year FE	Y	Y	Y	Y
District FE	Y	Y	Y	Y
Incl. Mysore	N	N	N	N
Ln pop. (1911) x year trend	N	N	Y	Y
Prov. trend	N	Y	N	Y

(b) Marriage Rate for Males Aged 15-20 Years

	Marriage Rate for Males Aged 15-20 Years			
	(1)	(2)	(3)	(4)
BI × SardaAct (1931)	-0.00779	-0.00301	-0.0135	-0.00148
	(0.00799)	(0.00882)	(0.0100)	(0.0106)
Observations	855	855	756	756
Number of Districts	337	337	259	259
Year FE	Y	Y	Y	Y
District FE	Y	Y	Y	Y
Incl. Mysore	N	N	N	N
Ln pop. (1911) x year trend	N	N	Y	Y
Prov. trend	N	Y	N	Y

Note: The table presents estimates for equation (1) with additional controls. The sample includes panel data at the district level for 1911-1931. Panel (a) uses the log of marriage rates for females aged 15-20 years as the outcome variable, while panel (b) uses the marriage rates in levels. BI is an indicator for districts under British India. $Year1931$ is an indicator for the year 1931. Controls include log total population at age 10-15 years. Column (2) controls for region-specific year trend; column (3) controls for log population (age 10-15 years) in 1911 interacted with year trend; column (4) includes both as controls. Regions are defined according to the historical definition in the Census of India between 1911-1931. The sample includes Assam, Baroda, Bengal, Bihar and Orissa, Bombay, Central India Agencies, Central Provinces, Gwalior, Hyderabad, Madras, Punjab, Rajputana, and United Provinces, excluding Mysore. Standard errors are clustered at the district level. *, **, *** indicate significance at 10%, 5% and 1% level.

Table A.4: Short-run effect on Literacy Rate

	Outcome: Female literacy (10-15)
	lit. rate
	(1)
BI × Year 1931	-0.0457
	(0.0430)
Observations	808
Number of Districts	301
Year FE	Y
District FE	Y
Incl. Mysore	N
Prov. trend	Y
Baseline literacy rate (1921)	0.0229

Note: This table examines the Sarda Act's short-term impact on female literacy using equation (1). The outcome variable is the female literacy rate, calculated as the number of literate females aged 10-15 years divided by the total female population in that age group for each district. The analysis includes districts within present-day India's borders, excluding those now in Pakistan and Bangladesh. The regression controls for the log of total population aged 10-15 years. Note that the sample size is smaller than in Table 1's marriage analysis because district-level literacy data for the Central India Agency in 1931 is not available in the Census. Standard errors are clustered at the district level. Significance levels: *, **, *** indicate significance at 10%, 5% and 1% level.

Table A.5: Short-Run Difference-in-Differences - Heterogeneity by Protestant Missionaries

(a) Log of Marriage Rate for Females Aged 5-10 Years

	Log of Marriage Rate for Females Aged 5-10 Years			
	(1)	(2)	(3)	(4)
BI × Year 1931	0.365***	0.376***	0.461***	0.438***
	(0.0931)	(0.125)	(0.113)	(0.131)
BI × Year 1931 × HighMissions	-0.413*	-0.450**	-0.506**	-0.496**
	(0.222)	(0.205)	(0.232)	(0.207)
Year 1931 × HighMissions	0.197	0.305	0.293	0.348*
	(0.209)	(0.196)	(0.221)	(0.199)
Observations	777	777	702	702
Number of Districts	296	296	235	235
Year FE	Y	Y	Y	Y
District FE	Y	Y	Y	Y
Incl. Mysore	N	N	N	N
Prov. trend	N	Y	N	Y
Ln pop. (1911) x year trend	N	N	Y	Y

(b) Marriage Rate for Females Aged 5-10 Years

	Marriage Rate for Females Aged 5-10 Years			
	(1)	(2)	(3)	(4)
BI × Year 1931	0.0388***	0.0311***	0.0397***	0.0354***
	(0.0105)	(0.0103)	(0.0121)	(0.0116)
BI × Year 1931 × HighMissions	-0.0833*	-0.0556	-0.0843*	-0.0585
	(0.0429)	(0.0428)	(0.0437)	(0.0432)
Year 1931 × HighMissions	0.0602	0.0492	0.0595	0.0509
	(0.0416)	(0.0416)	(0.0426)	(0.0421)
Observations	777	777	702	702
Number of Districts	296	296	235	235
Year FE	Y	Y	Y	Y
District FE	Y	Y	Y	Y
Incl. Mysore	N	N	N	N
Prov. trend	N	Y	N	Y
Ln pop. (1911) x year trend	N	N	Y	Y

Note: This table presents estimates from equation (3) using district-level panel data from 1911-1931. Panel (a) uses the log of marriage rates for females aged 5-10 years as the outcome variable, while panel (b) uses the marriage rates in levels. The analysis uses several indicator variables: BI for British India districts, Year 1931 for observations from 1931, and $HighMission$ for districts with above-median number of missionaries according to the World Atlas of Christian Missions (1911). The model includes interactions between $HighMission$ and $Year1931$. All specifications control for the log of total population aged 10-15 years. Column (2) adds region-specific year trends. Column (3) includes an interaction between 1911 log population (ages 10-15) and year trends. Column (4) incorporates both sets of controls. The analysis covers historical regions as defined in the Census of India (1911-1931): Assam, Baroda, Bengal, Bihar and Orissa, Bombay, Central India Agency, Central Province, Gwalior, Hyderabad, Madras, Punjab, Rajputana, and UP, excluding Mysore. The sample includes only districts within present-day India's borders. Standard errors are clustered at the district level. Significance levels: *, **, *** indicate significance at 10%, 5% and 1% level.

Table A.6: Short-Run Difference-in-Differences - Heterogeneity by migrant share in 1921

(a) Log of Marriage Rate for Females Aged 5-10 Years

	Log of Marriage Rate for Females Aged 5-10 Years			
	(1)	(2)	(3)	(4)
BI × Year 1931	0.255***	0.286**	0.314***	0.324**
	(0.0886)	(0.140)	(0.110)	(0.151)
BI × Year 1931 × HighMigShare	-0.257	-0.238	-0.0990	-0.110
	(0.181)	(0.165)	(0.175)	(0.166)
HighMigShare × Year 1931	0.191	0.184	0.0315	0.0624
	(0.169)	(0.153)	(0.162)	(0.153)
Observations	780	780	721	721
Number of Districts	285	285	243	243
Year FE	Y	Y	Y	Y
District FE	Y	Y	Y	Y
Incl. Mysore	N	N	N	N
Prov. trend	N	Y	N	Y
Ln pop. (1911) x year trend	N	N	Y	Y

(b) Marriage Rate for Females Aged 5-10 Years

	Marriage Rate for Females Aged 5-10 Years			
	(1)	(2)	(3)	(4)
BI × Year 1931	0.0441***	0.0457***	0.0398**	0.0469***
	(0.0135)	(0.0130)	(0.0155)	(0.0145)
BI × Year 1931 × HighMigShare	-0.0319*	-0.0316*	-0.0264	-0.0278
	(0.0193)	(0.0167)	(0.0212)	(0.0190)
HighMigShare × Year 1931	-0.0206	-0.00866	-0.0245	-0.0120
	(0.0157)	(0.0133)	(0.0179)	(0.0161)
Observations	781	781	722	722
Number of Districts	285	285	243	243
Year FE	Y	Y	Y	Y
District FE	Y	Y	Y	Y
Incl. Mysore	N	N	N	N
Prov. trend	N	Y	N	Y
Ln pop. (1911) x year trend	N	N	Y	Y

Note: The table presents estimates for equation (3). The sample includes panel data at the district level for 1911-1931. The outcome variable is log proportion of females married between 5-10 years of age for panel (a) and in level for panel (b). BI is an indicator for districts under British India. $Year1931$ is an indicator for the year 1931. $HighShare$ is an indicator that the share of migrant (from Europe and America) in a district is above the median in 1921. The specification includes the additional interaction terms between $HighShare$ × Year 1931. Controls include log total population at age 10-15 years. Column (2) controls for province-specific year trend; column (3) controls for log population (age 10-15 years) in 1911 interacted with year trend; column (4) includes both as controls. Regions are defined according to the historical definition in the Census of India between 1911 and 1931. The sample includes Assam, Baroda, Bengal, Bihar and Orissa, Bombay, Central India Agencies, Central Provinces, Gwalior, Hyderabad, Madras, Punjab, Rajputana, and United Provinces, excluding Mysore. This also represents the list of historical regions in the sample. The sample includes districts that are now in India. Standard errors are clustered at the district level. *, **, *** indicate significance at 10%, 5% and 1% level.

Table A.7: Short-Run Difference-in-Differences - Placebo by Protestant Missionaries

(a) Log of Marriage Rate for Females Aged 5-10 Years

	Log of Marriage Rate for Females Aged 5-10 Years			
	(1)	(2)	(3)	(4)
BI × Year 1931	0.288***	0.308**	0.346***	0.353***
	(0.0865)	(0.120)	(0.104)	(0.126)
Year 1931 × HighMissions	-0.156**	-0.0811	-0.145**	-0.0789
	(0.0664)	(0.0724)	(0.0676)	(0.0733)
Observations	777	777	702	702
Number of Districts	296	296	235	235
Year FE	Y	Y	Y	Y
District FE	Y	Y	Y	Y
Incl. Mysore	N	N	N	N
Prov. trend	N	Y	N	Y
Ln pop. (1911) x year trend	N	N	Y	Y

(b) Marriage Rate for Females Aged 5-10 Years

	Marriage Rate for Females Aged 5-10 Years			
	(1)	(2)	(3)	(4)
BI × Year 1931	0.0234*	0.0227*	0.0206	0.0253*
	(0.0122)	(0.0118)	(0.0139)	(0.0130)
Year 1931 × HighMissions	-0.0110	0.00162	-0.0136	0.000589
	(0.0115)	(0.0103)	(0.0114)	(0.0105)
Observations	777	777	702	702
Number of Districts	296	296	235	235
Year FE	Y	Y	Y	Y
District FE	Y	Y	Y	Y
Incl. Mysore	N	N	N	N
Prov. trend	N	Y	N	Y
Ln pop. (1911) x year trend	N	N	Y	Y

Note: The table presents estimates for equation (3). The sample includes panel data at the district level for 1911-1931. The outcome variable is the log proportion of females married between 5-10 years of age for panel (a) and in level for panel (b). BI is an indicator for districts under British India. $Year1931$ is an indicator for the year 1931. $HighMission$ is an indicator that the number of missionaries (in World Atlas of Christian Missions, 1911) in a district is above the median. The specification includes the additional interaction terms between $HighMissions\times$ Year 1931. Controls include the log of the total population at ages 10-15 years. Column (2) controls for province-specific year trend; column (3) controls for log population (age 10-15 years) in 1911 interacted with year trend; column (4) includes both as controls. Regions are defined according to the historical definition in the Census of India between 1911 and 1931. The sample includes Assam, Baroda, Bengal, Bihar and Orissa, Bombay, Central India Agencies, Central Provinces, Gwalior, Hyderabad, Madras, Punjab, Rajputana, and United Provinces, excluding Mysore. This also represents the list of historical regions in the sample. The sample includes districts that are now in India. Standard errors are clustered at the district level. *, **, *** indicate significance at 10%, 5% and 1% level.

Table A.8: Balancing test

	Boys literacy rate - 10-15		
	(1)	(2)	(3)
	BP	PS	Diff
1911	0.091	0.070	.
1921	0.102	0.084	.
Change (1911-1921)	0.010	0.012	-0.002
p-value	.	.	0.479
Obs	177	82	259
	Hindu population share		
	BP	PS	Diff
1911-Mean	0.772	0.814	.
1921-Mean	0.771	0.808	.
Change	-0.001	-0.004	0.003
Obs	142	97	239
p-value	.	.	0.617
	Muslim population share		
	BP	PS	Diff
1911-Mean	0.133	0.105	.
1921-Mean	0.135	0.106	.
Change	0.002	0.004	-0.002
Obs	142	97	239
p-value	.	.	0.581
	Christian population share		
	BP	PS	Diff
1911-Mean	0.011	0.002	.
1921-Mean	0.015	0.003	.
Change	0.004	0.001	0.003
Obs	142	97	239
p-value	.	.	0.172
	Tribal population share		
	BP	PS	Diff
1911-Mean	0	0	.
1921-Mean	0.058	0.042	.
Change	0.059	0.045	0.013
Obs	142	97	239
p-value	.	.	0.470

Note: The table presents the summary statistics for boy literacy for the age group of 10-15, separately for districts in British India and Princely states in col (1)-(2). Col. (3) presents the differences in the mean of the two groups. P-value in parenthesis

Table A.9: Short-run DiD with standard error adjusted for spatial correlation

	(1) Ln	(2) Ln	(3) Level	(4) Level
BI × Year 1931	0.200***	0.258***	0.0171**	0.0224***
	(0.0584)	(0.0883)	(0.00736)	(0.00790)
Observations	785	785	785	785
Number of Districts	301	301	301	301
Year FE	Y	Y	Y	Y
District FE	Y	Y	Y	Y
Incl. Mysore	N	N	N	N
Ln pop. (1911) × year trend	N	N	N	N
Prov. trend	N	Y	N	Y

Notes: The table estimates the short-run DiD equation using the standard adjusted for spatial correlation (Colella et al., 2019) with a cutoff distance of 50km.

Table A.10: Short run effects in ages 5-10: wild-bootstrap standard error

Outcome: Log of Share of Females Married at Age 5-10 Years				
$BI \times Year1931$	.1788	.1844	.2465	.2286
t-statistics	2.582	2.012	2.991	2.071
p-value	.027	.0501	.012	.0731
Year FE	Y	Y	Y	Y
District FE	Y	Y	Y	Y
Incl. Mysore	N	N	N	N
Prov. trend	N	Y	N	Y
Ln pop. (1911) x year trend	N	N	Y	Y
Outcome: Share of Females Married at Age 5-10 Years				
$BI \times Year1931$	.0154	.0197	.0132	.023
t-statistics	.969	1.64	.722	1.465
p-value	.3874	.1772	.5195	.2132
Year FE	Y	Y	Y	Y
District FE	Y	Y	Y	Y
Incl. Mysore	N	N	N	N
Prov. trend	N	Y	N	Y
Ln pop. (1911) x year trend	N	N	Y	Y

Note: The table presents the t-statistics and p-value for wild bootstrapping the $BI\times$ Year 1931 coefficients clustering at the province level for the specifications in Table 2

.

Table A.11: Placebo Outcome for Short-run Effect

	ln Total pop. 40-60
BI × Year 1931	0.00931
	(0.0221)
Observations	856
Number of districts	337
Year F.E	Yes
District F.E	Yes

Note: The table presents the treatment effect of the Sarda Act on the log of the total district population of the age group 40-60. The specification is estimated in equation (1). Mysore is excluded from the sample.

Table A.12: Summary statistics for present-day Pakistan and Bangladesh districts

	Marriage rate of female 5-10		
	British India districts		
	1911	1921	1931
Assam	.02904	.01902	.11772
Bengal	.0869	.06123	.27657
Bombay	.02564	.02996	.08253
North West Frontier	.00579	.00207	.01969
Punjab	.01735	.01614	.04734
	Princely state districts		
	1911	1921	1931
Bombay	.	.05824	.10221
Punjab	.0159	.01547	.03754

Note: The table presents the district-level average marriage rate of females aged 5-10, including only districts in present-day Bangladesh and Pakistan in 1911-1931.

Table A.13: Short-Run Difference-in-Differences - Including districts in present-day Pakistan and Bangladesh

(a) Log of Share of Females Married at Age 5-10 Years

	Log of Share of Females Married at Age 5-10 Years			
	(1)	(2)	(3)	(4)
BI × Year 1931	0.235***	0.232**	0.285***	0.266**
	(0.0727)	(0.107)	(0.0926)	(0.118)
Observations	966	966	863	863
Number of Districts	376	376	296	296
Year FE	Y	Y	Y	Y
District FE	Y	Y	Y	Y
Incl. Mysore	N	N	N	N
Prov. trend	N	Y	N	Y
Ln pop. (1911) x year trend	N	N	Y	Y

(b) Share of Females Married at Age 5-10 Years

	Share of Females Married at Age 5-10 Years			
	(1)	(2)	(3)	(4)
BI × Year 1931	0.0156*	0.0175**	0.00854	0.0195*
	(0.00882)	(0.00816)	(0.0106)	(0.00994)
Observations	967	967	864	864
Number of Districts	376	376	296	296
Year FE	Y	Y	Y	Y
District FE	Y	Y	Y	Y
Incl. Mysore	N	N	N	N
Prov. trend	N	Y	N	Y
Ln pop. (1911) x year trend	N	N	Y	Y

Note: The table presents estimates for equation (1) with additional controls. The sample includes panel data at the district level for 1911-1931. The outcome variable is the log child marriage rate for girls aged 5-10 years in panel (a) and in level for panel (b). *BI* is an indicator for districts under British India. Year 1931 is an indicator for the year 1931. Controls include log total population in ages 10-15 years. Column (2) controls for region-specific year trend; column (3) controls for log population (age 10-15 years) in 1911 interacted with year trend; column (4) includes both as controls. Regions follow the historical definitions from the Census of India between 1911-1931. The sample includes Assam, Baroda, Bengal, Bihar and Orissa, Bombay, Central India Agency, Central Provinces, Gwalior, Hyderabad, Madras, Punjab, Rajputana, United Provinces, North West Frontier, excluding Mysore. The sample includes districts that are now in India, Pakistan, and Bangladesh. Standard errors are clustered at the district level. *, **, *** indicate significance at 10%, 5% and 1% level.

Table A.14: Short-Run Effect on (DiD) on Age Structure

Outcome: No. of female 5-10/10-15		
	(1)	(2)
Year 1931	-0.186***	-0.245***
	(0.0212)	(0.0787)
Year 1931 × BI	0.0162	-0.00404
	(0.0207)	(0.0235)
Observations	856	856
Number of Districts	337	337
District FE	Y	Y
Year FE	Y	Y
Province-specific trend	N	Y

Note: The table presents estimates of equation (7) where the outcome is age structure, measured as the ratio of number of girls at age 5-10 to number of girls at age 10-15 for each district of each census year 1911-1931. The sample includes Assam, Baroda, Bengal, Bihar and Orissa, Bombay, Central India Agencies, Central Provinces, Gwalior, Hyderabad, Madras, Punjab, Rajasthan, and UP. Standard errors are clustered at the district level. *, **, *** indicate significance at 10%, 5% and 1% level.

Table A.15: Migration at Region Level: Summary Statistics

	Emigrants per 1,000 population of origin					
	Total		Destination BP		Destination PS	
Origin province	1921	1931	1921	1931	1921	1931
BP (share of pop in BI: 83-100%)	25.29	24.34	19.59	18.4	5.66	5.89
sd	(12.42)	(9.52)	(13.94)	(10.92)	(5.61)	(5.63)
N			8			
PS	68.29	60.03	48.23	41.4	20.03	9.61
sd	(36.13)	(30.51)	(33.78)	(26.25)	(27.64)	(10.26)
N			6			

Note: The table presents summary statistics for the number of emigrants per 1,000 population in each of the provinces/states. The top (bottom) panel presents the statistics for British India regions (princely states). The data from the Census is available at the region level. In the British provinces, the majority of the population is in districts that belong to British India (83%-100%), while it also includes districts that belong to princely states. Columns (1)-(2) present the average number of emigrants per 1,000 population for the years 1921 and 1931, respectively, and columns (3)-(4) are the average number of emigrants to British Provinces (per population at the origin provinces). Columns (5)-(6) are the average number of emigrants to princely states per population at the origin provinces. Standard deviations are presented in parentheses.

Table A.16: Short-Run Difference-in-Differences - Sex ratio heterogeneity

(a) Log of Share of Females Married at Age 5-10 Years

	Log of Share of Females Married at Age 5-10 Years			
	(1)	(2)	(3)	(4)
BI × SardaAct (1931) × HighFemaleShare	0.0233	0.0431	0.0215	0.0753
	(0.118)	(0.139)	(0.127)	(0.143)
BI × SardaAct (1931)	0.157*	0.153	0.230**	0.173*
	(0.0864)	(0.103)	(0.101)	(0.105)
Observations	855	855	756	756
Number of Districts	337	337	259	259
Year FE	Y	Y	Y	Y
District FE	Y	Y	Y	Y
Incl. Mysore	N	N	N	N
Ln pop. (1911) x year trend	N	N	N	N
Prov. trend	N	Y	N	Y

(b) Share of Females Married at Age 5-10 Years

	Share of Females Married at Age 5-10 Years			
	(1)	(2)	(3)	(4)
BI × SardaAct (1931) × HighFemaleShare	-0.0151	0.00982	-0.0116	0.0145
	(0.0175)	(0.0172)	(0.0186)	(0.0177)
BI × SardaAct (1931)	0.0262*	0.0125	0.0216	0.0124
	(0.0139)	(0.0133)	(0.0148)	(0.0142)
Observations	856	856	757	757
Number of Districts	337	337	259	259
Year FE	Y	Y	Y	Y
District FE	Y	Y	Y	Y
Incl. Mysore	N	N	N	N
Ln pop. (1911) x year trend	N	N	Y	Y
Prov. trend	N	Y	N	Y

Note: The table presents estimates for equation (1) with additional interaction terms with the indicator $HighFemaleShare$. The sample includes panel data at the district level for 1911-1931. The outcome variable is log child marriage rate for girls aged 5-10 years in panel (a) and in level for panel (b). BI is an indicator for districts under British India. Year 1931 is an indicator for the year 1931. $HighFemaleShare$ indicates if a district's share of girls aged 5-10 was above the median in 1921. Controls include log total population at age 10-15 years. Column (2) controls for region-specific year trend; column (3) controls for log population (age 10-15 years) in 1911 interacted with year trend; column (4) includes both as controls. Regions follow the historical definitions from the Census of India between 1911-1931. The sample includes Assam, Baroda, Bengal, Bihar and Orissa, Bombay, Central India Agencies, Central Provinces, Gwalior, Hyderabad, Madras, Punjab, Rajputana, and UP, excluding Mysore. This also represents the list of historical regions in the sample. The sample includes districts that are now in India. Standard errors are clustered at the district level. *, **, *** indicate significance at 10%, 5% and 1% level.

Table A.17: Share of Females Married Aged 10-15 years in 1911 and 1981, by Historical Regions

	Share married: 10-15 female					
Year	1911	1921	1931	1961	1971	1981
Assam	0.17	0.16	0.20	0.02	0.01	0.01
Baroda	0.48	0.35	0.32	0.06	0.03	0.02
Bengal	0.61	0.54	0.53	0.17	0.05	0.02
Bihar and Orissa	0.52	0.46	0.47	0.27	0.17	0.10
Bombay	0.60	0.53	0.43	0.14	0.06	0.03
CIA	.	.	0.44	0.42	0.33	0.18
Central Province	0.55	0.52	0.51	0.23	0.13	0.05
Gwalior	.	0.55	0.48	0.48	0.35	0.21
Hyderabad	0.71	0.63	0.60	0.36	0.21	0.11
Madras	0.25	0.22	0.22	0.07	0.03	0.01
Mysore	0.21	0.18	0.18	0.05	0.03	0.01
Punjab	0.39	0.34	0.32	0.09	0.06	0.03
Rajputana	0.44	0.41	0.41	0.32	0.25	0.18
United Province	0.54	0.51	0.47	0.28	0.21	0.11

Note: The table presents the district-level child marriage rates for girls aged 10-15 years in 1911 and 1981 by historical region. The child marriage rate is calculated as the percentage of girls who were married or widowed among all girls aged 10-15 years. Data are from the Census of India 1911-1981.

Table A.18: Medium-Run Difference-in-Differences, Yearly Effects

	ln Share of Female Married 10-15		Share of Female Married 10-15	
	Sample			
	1911-1961	1911-1981	1911-1961	1911-1981
	(1)	(2)	(3)	(4)
BI × Year 1931	0.0963***	0.157***	0.0138	0.0145
	(0.0371)	(0.0511)	(0.0113)	(0.0123)
BI × Year 1961	-0.435***	-0.379***	-0.0678***	-0.0586***
	(0.103)	(0.110)	(0.0215)	(0.0223)
BI × Year 1971		-0.530***		-0.0512**
		(0.149)		(0.0250)
BI × Year 1981		-0.630***		-0.0328
		(0.156)		(0.0264)
Observations	1014	1513	1014	1513
Number of Districts	284	285	284	285
Year FE	Y	Y	Y	Y
District FE	Y	Y	Y	Y

Note: The table presents estimates of equation (2) with flexible year indicators for 1961, 1971, and 1981. The outcome variable is the log share of females married between 10 and 15 years of age for columns (1)-(2) and the level of the share of females married between 10 and 15 years of age for columns (3)-(4). *BI* is an indicator variable for districts formerly under British India. Year 1931 is an indicator for the year 1931. Control includes (log) the total population of males at age 10-15 years. Columns (1) and (3) include 1911-1931 and 1961 samples. Columns (2) and (4) include samples from the years 1911-1931 and 1961-1981. Standard errors are clustered at the district level. *, **, *** indicate significance at 10%, 5% and 1% level.

Table A.19: Medium-run effect on literacy rate

	Outcome: Female literacy (10-15)
	lit. rate
	(1)
BI × Year 1931	-0.0297
	(0.0265)
BI × Post (1961-1981)	0.0795***
	(0.0219)
Observations	1507
Number of Districts	285
Year FE	Y
District FE	Y

Note: The table presents the medium-run effect of the Sarda Act on the literacy rate for females aged 10-15. It presents the estimate of equation (1) with the literacy rate of females (age 10-15) as an outcome. The female literacy rate is measured by the number of literate females aged 10-15 divided by the total number of females aged 10-15 in each district. Control includes a log population of 10-15-year-old males. Standard error clustered at the district level. *, **, *** indicate significance at 10%, 5% and 1% level.

Table A.20: Medium-run Difference-in-Differences-including 1941

	ln Married Rate (female)		Married Rate (female)	
	5-10	10-15	5-10	10-15
	(1)	(2)	(3)	(4)
BI × 1931	-0.0708	-0.0970**	-0.00288	-0.0586***
	(0.0914)	(0.0370)	(0.0174)	(0.0161)
BI × 1941	-0.856***	-0.403***	-0.0995***	-0.160***
	(0.150)	(0.0615)	(0.0177)	(0.0190)
Observations	283	286	283	286
No. of Dist	74	74	74	74
Year FE	Y	Y	Y	Y
District FE	Y	Y	Y	Y
Controls	N	N	N	N

Notes: The table includes districts for which 1941 data are available and are of comparable age group as 1911-1931, consisting of districts from Bengal, Bihar, Orissa, Bombay, Gwalior, Hyderabad, and Rajputana. Districts from Mysore and Baroda are excluded. The outcome variable is the log child marriage rate for girls aged 5-10 and 10-15 years in columns (1)-(2), and the level of child marriage rate for these age groups in columns (3)-(4).

Table A.21: Robustness check controlling for Hindu share in 1961 - Medium run

	Ln Married Rate 10-15 (female)	Married Rate 10-15 (female)
	(1)	(2)
BI × Year 1931	0.112**	0.0173
	(0.0445)	(0.0122)
BI × Post (1961-1981)	-0.432***	-0.0494**
	(0.128)	(0.0247)
Observations	1348	1348
Number of Districts	242	242
Year FE	Y	Y
District FE	Y	Y
Hindu Share (1961) × year FE	Y	Y

Notes: The table controls for the share of the Hindu population of a district in 1961 interacted with the fixed effect. The outcome variable is the log child marriage rate for girls aged 10-15 years in column (1), and the level of child marriage rate for girls aged 10-15 years in column (2).

Table A.22: Primary Education Policies in India

State	**Policy**	**Year**
Gujarat	Gujarat/Bombay Free Primary Education	1947
Orissa	The Orissa Basic Education Act	1951
Himachal Pradesh	Himachal Pradesh Compulsory Primary Education Act	1953
Assam	Assam Basic Education Act	1954
Kerala	Kerala Education Act	1958
Punjab	The Punjab Primary Education Act	1960
Delhi	Primary Education Act	1960
Bihar	Bihar Education Code	1961
Gujarat	Gujarat Free Primary Education (Amendment)	1963
Uttar Pradesh	The Uttar Pradesh Basic Education Act	1972
West Bengal	West Bengal Free Primary Education Act	1973
Tamil Nadu	Dr. Dharmambal Ammaiar Ninaivu Widow Remarriage Scheme	1975
Tamil Nadu	E.V.R. Maniammaiar Ninaivu Widow Daughter Marriage Assistance Scheme	1981

Table A.23: Robustness check: Medium-Run Difference-in-Differences controlling for other policies

	ln Share of Female Married 10-15												
	All	Assam Basic Educ. Act	Basic Educ. Act	Bihar Educ. Code	DAN Re-marriage Scheme	Widow Daughter Marriage Assist.	Gujurat/ Bombay Free Pri.	HP Act Educ.	Kerela Educ. Act	Primary Educ. Act	Punjab Pri. Educ. Act	UP Basic Educ. Act	West Bengal Free Pri. Educ. Act
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
BI × Post (1961-1981)	-0.490***	-0.426***	-0.495***	-0.559***	-0.498***	-0.498***	-0.557***	-0.527***	-0.506***	-0.503***	-0.487***	-0.533***	-0.495***
	(0.125)	(0.130)	(0.130)	(0.131)	(0.129)	(0.129)	(0.127)	(0.134)	(0.130)	(0.130)	(0.126)	(0.130)	(0.130)
Policy		-1.237***	-0.577**	0.685***	-0.650***	-0.650***	-0.876***	-0.429*	-0.126*	-0.791***	-0.694***	0.339***	-0.552***
		(0.285)	(0.236)	(0.192)	(0.0828)	(0.0828)	(0.268)	(0.252)	(0.0744)	(0.0953)	(0.241)	(0.116)	(0.129)
Observations	1513	1513	1513	1513	1513	1513	1513	1513	1513	1513	1513	1513	1513
Number of Districts		285	285	285	285	285	285	285	285	285	285	285	285
Year FE		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
District FE		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Share of Female Married 10-15												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
BI × Post (1961-1981)	-0.0649**	-0.0562**	-0.0484**	-0.0487**	-0.0509**	-0.0509**	-0.0522**	-0.0489**	-0.0496**	-0.0480**	-0.0491**	-0.0463*	-0.0464**
	(0.0251)	(0.0238)	(0.0236)	(0.0239)	(0.0234)	(0.0234)	(0.0238)	(0.0242)	(0.0236)	(0.0236)	(0.0237)	(0.0238)	(0.0234)
Policy		0.122***	0.00585	0.00597	0.195***	0.195***	-0.0682*	-0.0138	0.240***	-0.0652***	0.0303	-0.0244*	-0.0867**
		(0.0443)	(0.0400)	(0.0366)	(0.0139)	(0.0139)	(0.0385)	(0.0459)	(0.0122)	(0.0166)	(0.0214)	(0.0146)	(0.0344)
Observations	1513	1513	1513	1513	1513	1513	1513	1513	1513	1513	1513	1513	1513
Number of Districts		285	285	285	285	285	285	285	285	285	285	285	285
Year FE		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
District FE		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Note: The sample includes panel data at the district level for 1911-1931 and 1961-1981. The outcome variable is the log child marriage rate for girls aged 10-15 years in the top panel and level in the bottom panel. BI is an indicator for districts under British India. Year 1931 is an indicator for the year 1931, and $Post(1961-1981)$ is an indicator for the period 1961-1981. Controls include log total population of males aged 10-15 years. Each column from (2)-(13) controls for a state-specific reform indicator as shown in the column title, with details provided in Appendix Table A.22. Column (1) includes all policy indicators in the same specification. The sample includes Assam, Baroda, Bengal, Bihar and Orissa, Bombay, Central India Agencies, Central Provinces, Hyderabad, Madras, Punjab, Rajputana, UP and Mysore. Standard errors are clustered at the district level. *, , *** indicate significance at 10%, 5% and 1% level.

Table A.24: Medium-Run Difference-in-Differences - Heterogeneity by Urban-Rural

	ln Share of Female Married 10-15	Share of Female Married 10-15
	(1)	(2)
BI × Year 1931	0.248***	0.0501**
	(0.0854)	(0.0212)
Urban × Year 1931	-0.0218	-0.000392
	(0.105)	(0.0246)
BI × Post (1961-1981)	-0.371**	-0.0283
	(0.161)	(0.0307)
Urban × BI × Year 1931	-0.142	-0.0587**
	(0.107)	(0.0266)
Urban × Post	-0.403*	-0.0105
	(0.216)	(0.0392)
Urban × BI × Post (1961)	-0.209	-0.0438
	(0.246)	(0.0458)
Observations	1417	1417
Number of Districts	256	256
Year FE	Y	Y
District FE	Y	Y

Note: The table presents estimates of equation (2). The sample includes panel data at the district level for 1911-1931 and 1961-1981. The outcome variable is the log child marriage rate for girls aged 10-15 years in column (1) and in level for column (3). BI is an indicator for districts under British India. Year 1931 is an indicator for the year 1931, and $Post(1961-1981)$ is an indicator for the period 1961-1981. Controls include log total population of males aged 10-15 years. Urban is an indicator for districts with above-median urban population share in 1961. The sample includes Assam, Baroda, Bengal, Bihar and Orissa, Bombay, Central India Agencies, Central Provinces, Hyderabad, Madras, Punjab, Rajputana, United Province and Mysore. Standard errors are clustered at the district level. *, **, *** indicate significance at 10%, 5% and 1%.

Table A.25: Intergenerational Persistence of Age at Marriage

	Daughter Unmarried (=1 if yes)
	(1)
Age at First marriage of Mother	0.00286***
	(0.000907)
Observations	33,771
Sample Age Group	10 to 18 years
Controls	Y
District*Urban/Rural F.E	Y
Year of Birth F.E	Y

Note: The table analyzes marriage patterns for girls aged 10-18 years. The outcome variable is an indicator equal to 1 if a girl in age group "x" is unmarried at the time of interview. Controls include: mother's age and education level; household characteristics (religion, caste, head's gender and age); media exposure (weekly TV/radio consumption); partner's education; number of children; asset ownership (radio, TV, refrigerator, bicycle, motorcycle, car); and electricity access. The regression includes district-rural-urban and birth cohort fixed effects. Standard errors are clustered at district level. *, **, *** indicate significance at 10%, 5% and 1% level.

B Social Reform

Social reforms that were introduced by the British depended upon the discretion of the governors-general in charge and the native social reformers (Chitnis and Wright, 2007). All the British social reforms that were introduced by the governors-general were in direct conflict with the existing laws of Indian society (Lord William Bentinck, 1829; Carroll, 1983). The laws were passed after much deliberation by the reformist governors-general. The first of the most important social reforms introduced in colonial India was the abolition of Sati in 1829. Sati was only practiced by upper caste Hindus in Bengal, Rajputana, and Central India. It was a practice that involved a widow immolating herself on her husband's funeral pyre. The reform was pushed forward by a native social reformer, Raja Ram Mohan Roy. Lord William Bentinck introduced this law, arguing that the general masses of India were uncivilized and would continue this custom if the British did not bring forward a legal reform making it a punishable offense. In a speech in 1829, he pointed out that Britain could afford to abolish Sati without fearing a rebellion from the natives because the majority of Indian soldiers in the British army belonged to the tribes that did not practice Sati (Fisch, 2000). Since Sati was only practiced by a few ethnic groups in India, it was possible to extend the law outside British jurisdictions. The British negotiated with the princely states to abolish Sati - Rajputana was the last native state to abolish it in 1861 (Ramusack, 2003).

Since then, most of the social reforms were implemented within British India and did not apply to the princely states. With the initiative of the educationalist Pandit Iswar Chandra Vidyasagar, the British passed the Hindu Widow Remarriage Act of 1856. Until then, widow remarriage among upper caste Hindus had been prohibited, and Hindu widows were expected to live a life of austerity (Peers, 2013).

Although Sati was abolished in all of India, as a practice, it was not as widespread as female infanticide and child marriage (Grey, 2013), which existed across all of India and in all religions. Unlike Sati, the practice of female infanticide was not restricted to upper caste Hindus. The abolition of female infanticide (1870) and child marriage were harder to implement as they went directly against the widespread age-old customs of the natives across castes and tribes (Grey, 2011). The laws related to these practices were again confined to British India. In 1891, the Age of Consent Law was passed, which raised the age of consent to 12 years. This bill created much tension among the native population (Ramusack, 2003; Chitnis and Wright, 2007). The reforms were slow.

The Female Infanticide Prevention Act of 1870 was passed in British India to prevent the murder of female infants. Female infanticide was a very common practice in India because girls were perceived as an economic burden due to the dowry and other social customs (Census of India 1891, Sen (2002)).[37]

[37] See also Baines (1893)

C Child Marriage Restraint Act, 1929 (Sarda Act)

The earliest report on the increase in child marriages under the age of 10 in anticipation of the Sarda Act of 1929 was made available in Chapter VI of Census of India, Vol. I–India, 1931, authored by J.H. Hutton. In Chapter VI, Civil Condition Section 97, focusing on infant marriage, Hutton highlighted the large increase in child marriages, particularly among children under the age of 10, between the Sarda Act's passage (28th September 1929) and its enforcement (30th April 1930).

Notably, in the months immediately following the act's announcement, districts such as Hugli, Bankura, Dinajpur, Nadia, Dacca, and Chittagong observed a substantial increase in child marriages among both Hindus and Muslims. For instance, in Backargunj, an average of 305 minor Muslim marriages were registered monthly between 1921 and 1929. However, from January to April in 1930, the marriages of underage children were 419 in January, 1,320 in February, 8,782 in March, and 4,452 in April. In Bankura, child marriages were reported to be taking place at the rate of 1000 a day on religious days in February; in Dinajpur district, 10,000 marriages were reported between the middle of January and the middle of March. A similar increase in the number of children married was reported in Allahabad, Bihar, Tamil Nadu, Assam, Bombay Presidencies, and Upper Sind Frontier districts (now in Pakistan) towards the end of March 1930. One of the examples cited in the report includes the Madura district in south India, where 200 lawyers got their children between the ages of 6 and 10 married between March 12th and 15th in 1930. The increase in child marriages in Gujrat, particularly Baroda (princely state), was partly attributed to caste-based religious factors. For example, for the Kadvi Kumbi community in Gujrat, marriages are solemnized "when the goddess speaks," an event determined at the Umia Mata temple at Unjha. Such occasions were known to occur once in 12 years. The total population of Kadvi Kumbi was 269,348 in census year 1921, and in 1931, there were 219,161 in Baroda State alone.

The census report also sheds light on the role of money lenders in exacerbating the situation by spreading rumors that the act would lead to a 14-year prohibition on marriages, thereby incentivizing families to arrange marriages hastily. This rush led to several legal complications, including marriages conducted without parental consent for marriages or misrepresentation of the parties' caste, resulting in numerous criminal cases.

D Integration of Princely States

In May 1946, the memorandum concerning State Treaties and Paramountcy was issued, announcing the termination of all political arrangements between the States and the British Crown (Sharma, 1967; Khanam, 2016; Singh, 2007; Furber, 1951). Following the Indian Independence Act of 1947, 514 of 565 princely states were integrated into the Government of India. In the years that followed, other princely states, including Hyderabad, Junagadh, and Kashmir, were integrated into the Government of India through diplomatic and military strategies (Sharma, 1967; Khanam, 2016; Singh, 2007; Furber, 1951).

India was subsequently divided into three different types of state. In Part A, states were merged with contiguous provinces and ceded "full and exclusive authority, jurisdiction and powers for and in relation to the governance" to the Dominion of India (Sharma, 1967; Khanam, 2016; Singh, 2007; Furber, 1951). Part B states were grouped into separate administrative units and annexed in three stages: 1) in July and August 1947, the princes had to accede to the Government of India in relation to defense, foreign affairs, and communications; 2) in 1948–1949, further delegation of power occurred; and in 1949–1950, there was full integration, whereby the states had to accept the Constitution of India as the constitution of their own. Part C states were directly administered by the central administration of the Indian government (Sharma, 1967; Khanam, 2016; Singh, 2007; Furber, 1951). The States Reorganization Act of 1956 further reorganized these states along linguistic lines, and the Seventh Amendment of the Constitution (1956) unified all princely states and former British India under a single administrative and legal system (Sharma, 1967; Khanam, 2016; Singh, 2007; Furber, 1951).

E Age Structure

In this section, we examine the possibility of misreporting age in the census data of 1911-1931 and its implications for our estimation of the short-run effect of the Sarda Act.

The announcement of the Sarda Act may have created an incentive for households to misreport the age of their girls because the 1931 census was conducted close to the time that the Sarda Act was announced and implemented. Households may have overreported the age of their married daughters if they were under 14 years of age at the time the census was conducted. This overreporting may have minimized the risk for families of being penalized for organizing marriages for girls below the age of 14 years.

We examine the extent of such misreporting behavior and test whether it confounds our difference-in-differences estimates in equation (1). For each district, gender, and census year, we measure the age structure of the district using the relative number of the population of district i in year t in the age group of 5-10 to that of age group 10-15. Specifically, we compute the ratio R_{it} using:

$$R_{it} = \frac{T_{it}^{5-10}}{T_{it}^{10-15}}$$

where T_{it}^{5-10} and T_{it}^{10-15} are the population of the age group from 5 to 10 years, and 10 to 15 years, respectively.

Figure A.2 plots the histogram of age structure at the district level by census year and gender. Panel (a) of Figure A.2 plots the histograms of age structure for girls for the census years 1911-1931. In 1911 and 1921, the modes of the relative population size of the two age groups are around 1.2-1.3, suggesting that, on average, there were more girls at age 5-10 years in comparison with age 10-15 years. In 1931, the mode of that ratio is slightly lower than that in 1911-1921. This suggests that in 1931 there were on average fewer children aged 5-10 compared

with 1921 or 1911 within each district, relative to those aged 10-15 years. Panel (b) in Figure A.2 plots the same measure for boys; which reveals a similar pattern, although the magnitude of the shift is weaker for boys. This is consistent with the finding that there could be age misreporting in the 1931 census to a certain extent, or if there are other reasons for rapid demographic change between 1921 to 1931.

We then examine whether this age structure change or potential misreporting was different between British India and the princely states. We estimate the following variant of equation (1):

$$R_{it} = \beta_1 BI_i \times Year1931 + \mu_i + \gamma_t + \epsilon_{it} \tag{7}$$

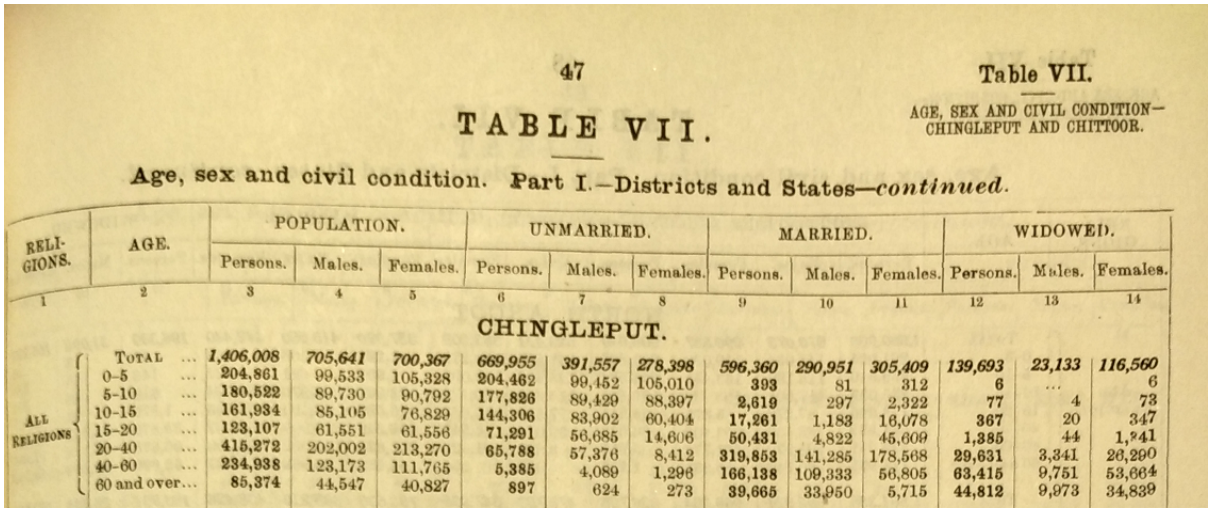
We report the estimates of equation (7) in Table A.14. We find that the estimate of β_1 in equation (7) is not statistically significantly different from zero. This suggests that any change in the age structure was not correlated with the princely states and districts in British India, and it does not support the hypothesis that the Sarda Act caused natives to misreport age. The change in the reported age structure shown in Figure A.2 could be related to other unobserved national factors, which would be controlled for by year fixed effect in the estimation of equation (1). We therefore consider that the possibility of misreporting age would not confound our estimation of equation (1).

F Construction of district level panel data, 1911-1981

The lists of districts in the censuses of 1911-1931 are highly consistent across years. Changes in district names and district divisions are evident between 1931 and 1961 and from 1961 onwards. We track the district name changes using district history records from Government of India district websites, and we aggregate the district splits during 1961-1981 to match with the corresponding 1931 district. In the few occurrences of district merges, we match the merged district with the original districts, and our empirical analysis clustered at the merged district level in these cases. In the case of districts with multiple origins, where each origin could be linked to more than one post-independence district, we keep the district-year data point where the district's names are the same across all years.

The original archives are available at the British Library, LSE Library, and the University of Oxford Library, which formed our main sources. The census tables for each province are reported in their respective volume for each year. The marriage and literacy data we used are from the "Age, sex and civil condition" and the "Literacy" section in the census volume from each province. The electronic copies of some provinces and years are also available at online resources from the Repository of Gokhale Institute Of Politics & Economics (GIPE). Figure A.7 shows a capture of the original census book.

Figure A.7: Age, sex and civil condition tables in Census of India, 1911



47 Table VII.

TABLE VII.

AGE, SEX AND CIVIL CONDITION—CHINGLEPUT AND CHITTOOR.

Age, sex and civil condition. Part I.—Districts and States—*continued*.

RELIGIONS.	AGE.	POPULATION.			UNMARRIED.			MARRIED.			WIDOWED.		
		Persons.	Males.	Females.	Persons.	Males.	Females.	Persons.	Males.	Females.	Persons.	Males.	Females.
1	2	3	4	5	6	7	8	9	10	11	12	13	14
					CHINGLEPUT.								
ALL RELIGIONS	TOTAL ...	*1,406,008*	*705,641*	*700,367*	*669,955*	*391,557*	*278,398*	*596,360*	*290,951*	*305,409*	*139,693*	*23,133*	*116,560*
	0–5 ...	204,861	99,533	105,328	204,462	99,452	105,010	393	81	312	6	...	6
	5–10 ...	180,522	89,730	90,792	177,826	89,429	88,397	2,619	297	2,322	77	4	73
	10–15 ...	161,934	85,105	76,829	144,306	83,902	60,404	17,261	1,183	16,078	367	20	347
	15–20 ...	123,107	61,551	61,556	71,291	56,685	14,606	50,431	4,822	45,609	1,385	44	1,341
	20–40 ...	415,272	202,002	213,270	65,788	57,376	8,412	319,853	141,285	178,568	29,631	3,341	26,290
	40–60 ...	234,938	123,173	111,765	5,385	4,089	1,296	166,138	109,333	56,805	63,415	9,751	53,664
	60 and over...	85,374	44,547	40,827	897	624	273	39,665	33,950	5,715	44,812	9,973	34,839

Note: The figure shows part of the Age, Sex and Civil condition table in the Census of India 1911, for the district Chingleput in Madras Presidency.

G Migration discussion

In this section, we examine the extent of migration in the period 1921-1931 in British India and the princely states. Migration data at the province/state level are available from the Census report, which also indicates the destination provinces/states. It allows us to understand better the pattern of migration between British India districts and the princely states.

If migration over long distance for marriage reason is common and feasible for the average households, households in British India districts that have a strong inclination or preference to marry their daughters at a young age may choose to marry their daughters to nearby princely states to avoid the Sarda Act in 1931. In that case, our estimates of the short and medium-run effect could capture the sorting effect on households with different marriage practices due to migration, in addition to any effect on changing female child marriage practice of a given group.

The British India regions and princely states are defined (and analyzed) at the district level, but the migration data from the Census are reported at a more aggregate province/state level. Some provinces include districts/populations from British India and the princely states. We calculate the share of the population in a province under British India. There are two clear groups of province/states - those with 83-100% of the population belonging to British India districts and those that entirely consist of princely states. We refer to provinces that have more than 83% share of the population under British India as British provinces in this section. Focusing on the same set of provinces/states as in our district-level analysis in section-4.3, 5.3, 6.3, we have 8 British provinces and 6 princely states.

Table A.15 presents the summary statistics on migration at province/states level, in terms of the number of emigrants per 1,000 population of the origin province/state. The average level of emigrants was about 51 per 1,000 population in 1921. This suggests that about 5% of the population migrated to provinces/states outside of where they were born. There is more

out-migration in princely states on average, where emigrants per 1,000 population are 68.29, compared to 25.29 in the British provinces.

We do not find any significant changes in the average level of emigration in 1931 for either the British provinces or princely states. The number of out-migration in princely states went down slightly from 68 to 60. There was almost no change in total emigration in British provinces in 1931 compared to 1921. This suggests that migration was stable during this period of time.

In particular, the number of emigrants from British provinces to princely states was 6 per 1,000 population in 1921 and remained unchanged between 1921 to 1931. This suggests that there is no significant movement of migration from British provinces to princely states that could possibly be associated with the avoidance of the Sarda Act. The out-migration from princely states, to either the British provinces or between princely states, both went down slightly. We, therefore, observe no significant change in the migration pattern between British provinces and princely states during the period 1921-1931.