Closing the Gap? Effect of Inheritance Law Reforms on Educational Gender Gap among Siblings

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Abstract

This study examines the impact of inheritance law reforms on the gender gap in human capital accumulation within the household. Five Indian states, Kerala, Andhra Pradesh, Tamil Nadu, Karnataka, and Maharashtra, reformed inheritance laws for Hindus before the federal amendment in 2005. These early reforms granted daughters equal rights to inherit ancestral property, creating a natural experiment to assess their effect on intra-household resource allocation, especially educational investments. To estimate the effect of the equal inheritance reform, we utilized a triple difference-in-difference strategy by exploiting the features of the reform. Using three rounds of nationally representative data from the National Family and Health Surveys (NFHS 1, 2, and 3), we analyzed whether these legal changes reduced the disparity in educational attainment between male and female siblings. The findings indicate that the reforms had a significant positive effect on narrowing the educational gender gap among siblings, particularly benefiting girls who were young and still of school-going age at the time of the reform in land-owning households. The effect is stronger in households with more educated mothers, highlighting the role of intra-household bargaining and women's empowerment. Importantly, the reform closes disparities primarily at higher educational levels, where parental investment discretion is greatest. These findings underscore how legal reforms can reshape intra-household preferences and contribute to gender equity in human capital investment, offering vital policy insights for promoting inclusive economic development.

Keywords: Educational gender gap, inheritance law reforms, intra-household resource allocation, Triple difference-in-difference

JEL Codes: D13, J16, K11

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Introduction

A growing body of literature confirms that reducing gender disparities in educational attainment not only promotes equity but also enhances economic growth (Minasyan et al., 2019). The magnitude of these effects is sizable, particularly in developing regions. Klasen and Lamanna (2009) estimate that South Asia could have experienced 0.8–1.0 percentage points higher annual per capita income growth between 1960 and 2000 had it achieved East Asia's level of gender parity in education. Despite substantial progress globally, marked gender disparities persist across several dimensions in many low- and middle-income countries, including India, where girls frequently lag behind boys in educational investment, even within the same household (Azam & Kingdon, 2013).

Existing evidence suggests that these disparities are driven in large part by household-level preferences for sons, embedded in long-standing cultural norms and patriarchal structures. In India, family decisions about resource allocation are shaped by traditional patrilineal and patrilocal norms, wherein sons are expected to inherit property and care for aging parents, while daughters are viewed as transient family members destined to marry out. These beliefs influence parental investment decisions, often to the disadvantage of daughters, who receive less human capital investment relative to their male siblings (Azam & Kingdon, 2013; Rathore & Das, 2021). As a result, gender gaps in educational attainment emerge not merely from differences in access to schooling but from intra-household dynamics that consistently privilege sons over daughters.

In this context, policy reforms that alter the economic value of daughters have the potential to shift these ingrained preferences. One such intervention is the inheritance laws reforms to grant women equal rights to ancestral property. Such reforms have a direct impact on daughters' legal and economic status, potentially changing how they are perceived within their natal households. By enhancing daughters' claim on family assets, inheritance law reforms reconfigure intra-household bargaining dynamics, increase the expected returns to investing in girls, and thereby reduce parental bias in allocating educational resources. While earlier research has documented the positive effects of these reforms on women's overall educational attainment (Deininger et al., 2013; Roy, 2015; Agarwal & Naik, 2024), fewer studies have focused on whether girls and boys within the same family are treated more equally in terms of education after inheritance law reforms gave daughters equal rights to family

property. Our paper differs from earlier studies in identification and focus (Deninger et al., 2010; Roy, 2011).

This study addresses that gap by investigating whether strengthening inheritance rights for women reduces gender inequality in educational investment at the household level. Our focus is on the within-household educational attainment gap between brothers and sisters, a measure that directly captures changes in intra-household preferences. We argue that if daughters are perceived as rightful heirs, rather than financial liabilities, parents may be more inclined to invest equally in their education vis-à-vis sons. By comparing daughters to their brothers within the same household, we net out shared constraints such as parental preferences and household wealth. If, under these conditions, we observe improvements in daughters' education relative to their brothers after the reform, it suggests that parents did not substitute away from human capital investment. Instead, the reform prompted an increase in the relative value of daughters, consistent with a genuine gain rather than a reallocation of resources within the household (i.e., shifting investment from sons to daughters or from education to inheritance).

India provides a compelling setting for examining this question because of the staggered adoption of inheritance law reforms across states and over time. Between the late 1970s and early 1990s, five Indian states- Kerala, Andhra Pradesh, Tamil Nadu, Karnataka, and Maharashtra introduced amendments to the Hindu Succession Act (HSA) that granted equal coparcenary rights to unmarried daughters in joint family property. In 2005, a national amendment extended these rights to all daughters, regardless of marital status. These staggered reforms, coupled with variation in households' land ownership status, create a quasi-experimental setting for causal identification of the reform's impact.

To estimate the effect of inheritance law reform, we employ a triple difference-in-differences (DDD) framework using repeated cross-sectional data from the Indian National Family Health Survey (NFHS), covering the periods 1992–1993, 1998–1999, and 2005–2006. We identify the effect of the inheritance reform by comparing the sibling gender gap in education across treated and untreated groups, where treatment is defined as girls of school-going age at the time of the reform in reform states and landowning households. All other subgroups, older girls in reform states, and individuals (all age cohorts) in non-reform states, serve as control groups. The triple-difference empirical strategy allows us to isolate the effect of the reform from state-level trends, age cohort effects, and differences across landowning and

non-landowning households. The identifying assumption is that in the absence of the reform, the difference in gender gaps between treated and untreated cohorts in landowning households would have followed similar trends across reform and non-reform states.

We find that the inheritance reforms significantly narrowed the educational gender gap, particularly in landowning households, and especially for daughters who were still of school-going age at the time of the reform (≤ 10 years at the time of the reform). To further examine whether the reform led to a genuine narrowing of gender disparities rather than a redistribution favoring daughters at the expense of sons, we redefined our outcome variable by direction of the sibling education gap. Where sons were more educated (negative gaps), we find that the reform significantly reduced the gap. In contrast, when we examine for where daughters were already ahead (positive gaps), we find no significant effect. This supports our interpretation that the reform helped daughters catch up, rather than creating new disparities by boosting girls beyond boys.

Moreover, the reform's effect on narrowing the intra-household gender gap is significantly stronger in households with more educated mothers. This heterogeneity aligns with models of household bargaining and informational capacity, wherein better-educated women are more likely to advocate for equitable investments in daughters following an exogenous increase in their economic value through inheritance rights (Thomas et al., 1991; Duflo, 2003). We also conduct placebo tests using non-Hindu households, whose inheritance laws were governed by different provisions[4] and were unaffected by the reform, ensuring the validity of our results across different populations.

A key innovation of our methodology is the direct measurement of the gender gap as the dependent variable. We contend that this approach, compared to individual-level models, offers greater policy relevance and more intuitively reflects the goal of gender equality. Our findings are robust when extended to additional rounds of the NFHS that capture the effects of the 2005 federal reform as well, and hold when comparisons are made within reform states. We support this argument with robustness checks across outcome definitions, like using the difference in education level instead of years of education or the average siblings' education

[4] For communities other than Hindus, inheritance and succession are governed by personal laws: For Muslims, the Muslim Personal Law (Shariat) Application Act, 1937, applies, drawing on traditional Islamic principles that specify fixed shares for heirs, which are not codified by a single legislative act in India. Daughters inherit half the share of sons and widows generally receive one-eighth (with children) or one-fourth (if childless).For Christians, the Indian Succession Act, 1925, provides a unified, largely gender-neutral legal framework for both testate and intestate succession, granting equal rights to sons, daughters, and spouses.

gap instead of the difference between the eldest sister and brother. We also examined whether the results are not driven by the divorced/separated daughters or marital status. Similarly, inheritance in the Indian context is mostly in the form of land, so we checked if the results hold for other kinds of assets like durables and house ownership.

Notably, our research also offers new insight into the stages at which gender gaps close. Sub-sample analysis using brothers' educational attainment as a parental preference proxy reveals that the reforms did not significantly impact primary or middle school educational gaps (levels where education is already universal and free). Instead, the convergence is driven by gains at higher educational levels, such as secondary and above, where household discretion over educational investment is greater and costs are higher. This distinction is significant: it suggests that gender-equalizing legal reforms are most effective in closing the gender gap precisely at those higher levels of education that are more consequential for women's future empowerment, labor market participation, and long-term socioeconomic mobility.

This study highlights how asset equality reforms can lead to significant human capital gains, reinforcing the need for holistic policy approaches addressing both physical and human capital dimensions of gender disparity. However, our findings are primarily drawn from families with both male and female children, and thus, may not fully generalize to all household structures if these families are systematically different from those with only same-gender children.

Due to the characteristics of the survey data, our analysis has several limitations. First, our results may be influenced by survivor bias or sample selection bias. As mentioned earlier, previous studies have reported that reforms can negatively impact women. In other words, households that choose to raise daughters may be more progressive regarding gender and may tend to invest more in education. Since the survey is conducted at the household level, it does not capture information about individuals outside the surveyed household. This means we cannot obtain information about household members who have left due to marriage or employment, or those who have passed away. To address this issue, we used the India Rural Economic and Demographic Survey (REDS 1999), a nationally representative rural sample of Indian households that contains detailed economic, demographic, and village-level information. They have data on all the children who are staying in the household or have left the house after marriage. We find results to be consistent with our findings with NFHS data.

The rest of the paper is organized as follows: Section 2 describes the Hindu Succession Act and subsequent amendments. Section 3 provides a brief overview of the related literature. In sections 4 and 5, we present data sources and discuss variables, empirical strategy, and methodology. In sections 6 and 7, we present our empirical findings and robustness results. Finally, in Section 8, we sum up with a discussion.

The Hindu Succession Act (1956) and its Amendments (1976-2005)

Hindu inheritance law, which today applies to some 83% of India's population (Hindus, Sikhs, Jains, and Buddhists) (Agarwal & Naik, 2024). This section outlines the historical and legal context of inheritance reforms in India. Prior to 1956, Hindu succession laws were governed by two systems: Mitakshara, which prevailed in most states, and Dayabhaga, primarily in Assam and West Bengal. Both systems significantly restricted women's access to family property. In the Mitakshara system, property was classified as either separate (self-acquired) or joint (inherited). Joint property, shared among male family members under the coparcenary system, largely consisted of agricultural land (Rosenblum, 2015; Agarwal, 1994), which women could not inherit. Colonial laws further entrenched these restrictions, allowing widows to inherit property only after the 1937 reform.

The 1956 Hindu Succession Act (HSA) marked a significant change by allowing daughters to inherit from their fathers' separate property and their portion of the joint property if he died without a will. However, women were still excluded from being coparceners, meaning they could not inherit the property by birth, unlike their brothers.

In pursuit of greater gender equality, five states amended the HSA 1956 to give daughters (unmarried at the time of the reform) coparcenary rights, enabling them to inherit ancestral property equally with male heirs. Kerala was the first state to amend the Act in 1976, followed by Andhra Pradesh (1986), Tamil Nadu (1989), and Karnataka and Maharashtra (1994) [see Figure 1]. These reforms allowed women to claim land and property inherited from their ancestors. Kerala's reform differed from the others by completely abolishing the joint property system.

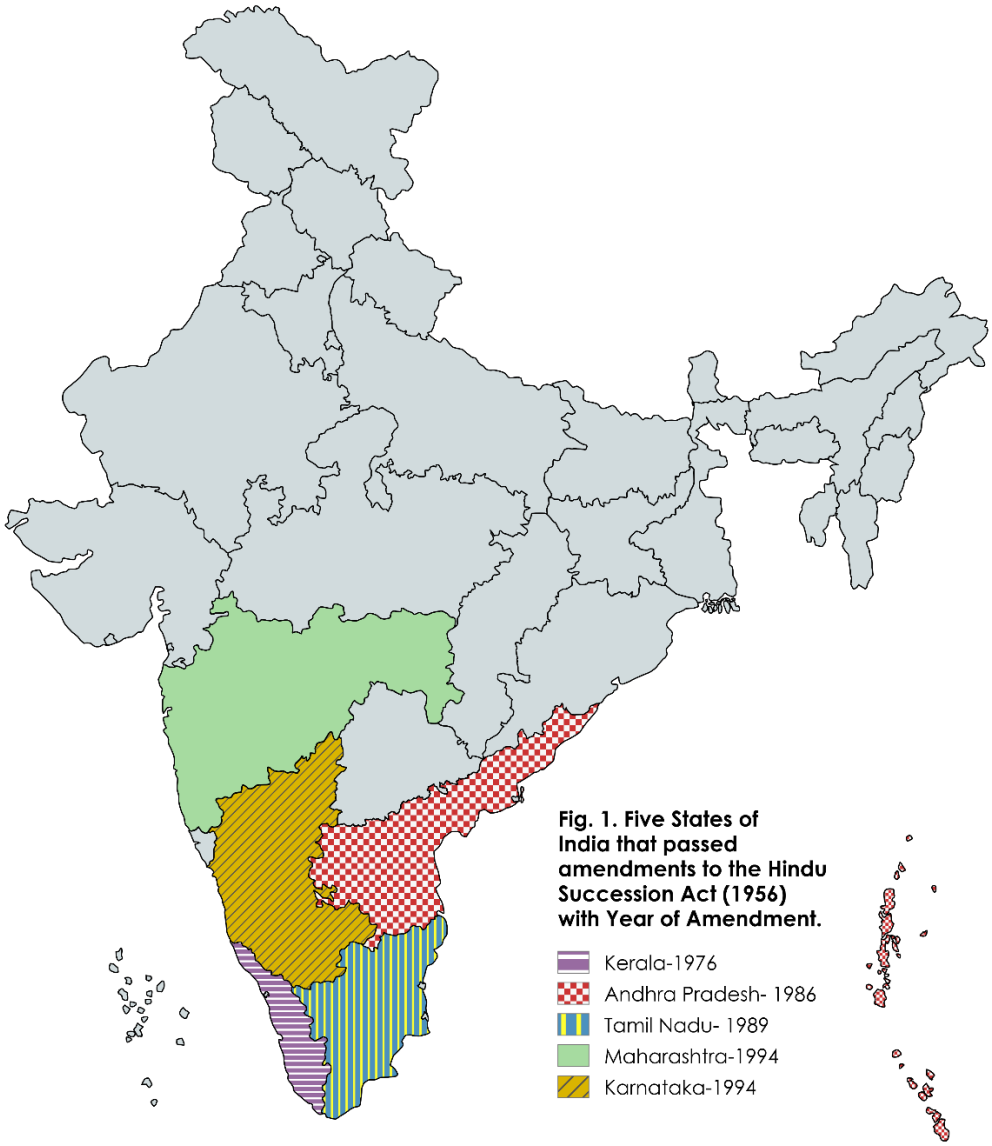


Fig. 1. Five States of India that passed amendments to the Hindu Succession Act (1956) with Year of Amendment.

In 2005, the Indian central government passed the Hindu Succession Amendment Act (HSAA), extending similar provisions to all states except Jammu and Kashmir, allowing women (both married as well as unmarried) nationwide to become coparceners by birth. This paper examines how these amendments influenced daughters' educational outcomes, particularly by comparing their educational attainment to that of their male siblings, thereby evaluating the potential impact of enhanced property rights on reducing gender disparities in education. The amendments offer a lens to assess whether improved inheritance rights for women translated into greater educational equity within households.

Related Literature

Despite progressive legislation intended to secure inheritance rights for women in India, empirical evidence has repeatedly shown that these reforms have not produced the immediate, first-order effects anticipated in terms of equalizing property ownership (Agarwal et al., 2021). Instead, the tenacity of intra-household dynamics and entrenched social norms has led parents to seek alternative strategies to compensate daughters for their persistent exclusion from familial land—often resulting in unintended but meaningful increases in other forms of intergenerational transfers, such as educational investment or dowries (Roy, 2015). The persistence of patrilocal marriage systems, as highlighted by Yamamoto (2025), continues to constrain the elasticity of female land ownership, reinforcing the notion that statutory changes alone are insufficient without broader shifts in kinship and marital organization. Even in reform-affected states, while there is greater awareness of gender equity in asset distribution, the transmission of land to daughters remains stubbornly low. This context compels a shift in focus toward more subtle but consequential outcomes, the prospect that reforms have encouraged parents to invest more heavily in daughters' human capital, notably education, as an alternative vehicle for resource equalization.

Accordingly, this study interrogates whether inheritance reforms narrowed the educational investment gap between brothers and sisters, signaling deeper progress toward intra-household gender equality. In addressing this question, our inquiry contributes substantively to three intersecting literatures: (i) the impact of inheritance rights on women's socioeconomic trajectories, (ii) the economics of intra-household allocation and gender bias, and (iii) the dynamics of intergenerational human capital transfer under changing legal institutions.

Inheritance Law Reform and Women's Empowerment

A substantive strand of research documents the far-reaching but ambivalent empowerment effects of inheritance rights reform (Meinzen-Dick et al., 2019; Mookerjee, 2019; Harari, 2019; Nguyen & Le, 2023; Grover & Sharma, 2025). Studies exploiting cross-state legislative variation show that strengthened female property rights are robustly associated with greater educational attainment for women (Deininger et al., 2010, 2013, 2019; Heath & Tan, 2020; Sapkal, 2017; Roy, 2015; Yamamoto, 2025), later marriage (Deininger et al., 2010, 2013; Heath & Tan, 2020), dowry payments (Makino, 2019; Roy, 2015), increased female labor force participation (Heath & Tan, 2020; Sapkal, 2017; Gupta, 2022), and heightened autonomy in

household decision-making (Heath & Tan, 2020). Recent scholarship reveals positive spillovers beyond direct beneficiaries: daughters of reform-exposed mothers exhibit improved health and nutritional outcomes (Bose & Das, 2017; Ajefu et al., 2022; Tandel et al., 2023). Yet, legal empowerment can also provoke resistance, as illuminated by studies charting rising intra-household conflict, domestic violence, and adverse demographic consequences—such as increased female foeticide—in the wake of reform (Anderson & Genicot, 2015; Rosenblum, 2015; Amaral, 2017; Bhalotra et al., 2020). Collectively, this work underscores the paradox that legal reforms may simultaneously advance and destabilize the prospects for gender equality, with their effects refracted through the prism of social structure and bargaining dynamics.

A critique of this literature, however, is that it tends to treat female outcomes in isolation, rarely benchmarking the progress of daughters relative to their brothers within the same family. As such, the central question of whether reforms catalyze a genuine convergence in gendered parental investment rather than simply lifting the average status of women remains largely unaddressed.

Intra-Household Allocation and gender bias

The "unitary household" paradigm has ceded ground to a more nuanced understanding of resource allocation shaped by intra-household bargaining, social norms, and gendered preferences (Becker & Tomes, 1979; Thomas, 1994; Duflo, 2003; Das Gupta, 2005; Jayachandran, 2015). In South Asia, deep-seated patrilineal and patrilocal practices underpin a systematic tilt in parental investments towards sons, manifested in disparities in schooling, health care, and access to economic opportunity (Kingdon, 2005; Azam & Kingdon, 2013; Kaul, 2018). Yet, rarely do empirical studies measure these allocations as explicit sibling gaps, which would offer a more granular and revealing window on changing parental norms in response to policy reform.

Intergenerational Transfers, Legal Change, and Human Capital

The intergenerational transfer of resources, both tangible (land, wealth) and intangible (education, aspiration), is powerfully mediated by formal institutions and embedded expectations. In South Asian settings, daughters' educational investments have traditionally been stunted by their exclusion from property and their expected "departure" from the natal household. International evidence (Quisumbing & Otsuka, 2001; La Ferrara & Milazzo, 2017) documents the mounting influence of inheritance practice on educational mobility. The

staggered rollout of the Hindu Succession Act amendments across Indian states has thus provided an especially salient testbed for assessing how legal reforms reshape the calculus of parental investment. Notably, however, most extant studies document aggregate gains for women's education (Deininger et al., 2013; Roy, 2015; Sapkal, 2017; Heath & Tan, 2020; Yamamoto, 2025) without interrogating whether parents have reallocated resources between their sons and daughters within the same family.

This study addresses these critical blind spots by centering analysis on the intra-household gender gap in education among siblings—a direct, policy-relevant measure of parental preference and resource transfer. Our study utilizes data from 15 major Indian states, offering broader geographic coverage compared to Deininger et al. (2010). In contrast to Roy (2011), who uses brothers as the control group, our identification strategy compares women who were differentially exposed to inheritance reforms based on their age at the time of the amendment. We focus on intra-household gender disparities in education, using the gender gap in educational attainment between siblings as the outcome variable. Importantly, we examine how this effect varies by landownership, as the inheritance reforms are most binding in households with land. Our central hypothesis[5] is:

H1: *Inheritance law reforms in India reduced the gender gap in education between brothers and sisters within the same household, particularly in landowning households in reform states.*

Data and variables

For our main analysis, we focus on data from the first three rounds of the National Family and Health Survey (NFHS), since the federal reform came in 2005. We constructed a pooled cross-sectional dataset using NFHS-1 (1992-1993), NFHS-2 (1998-1999), and NFHS-3 (2005-2006). The NFHS uses a stratified, multistage cluster sampling method to generate a nationally representative sample of households in both urban and rural areas across 29 states. The dataset includes individual-level information on household members.

Our analysis is restricted to daughters of the household head in mixed-gender families those with both male and female children where the children are at least 22 years old at the time of the survey (ensuring that both sons and daughters have completed their education). We examine the gender gap in education between the eldest daughter and son unless otherwise

[5] We discussed a conceptual framework in Appendix.

specified. Additionally, we restrict the sample to Hindu, Buddhist, Sikh, and Jain women those governed by the original Hindu Succession Act of 1956 and thereby directly affected by the reform.

We exclude Union territories, West Bengal, Jammu and Kashmir, and Northeastern states from our analysis. Union territories are politically and administratively different from rest of India; West Bengal and Assam practice the Dayabhaga system of property right, which allows girls to inherit various types of property. Jammu and Kashmir was not subject to the HSA. The northeastern states are not part of the analysis because they are matrilineal kinship areas (Jayachandran & Pande 2017). We use data on the following: the five treatment states are Kerala, Andhra Pradesh, Tamil Nadu, Maharashtra, and Karnataka; and 10 control states are Bihar (includes Jharkhand), Goa, Gujrat, Haryana, Himachal Pradesh, Madhya Pradesh (includes Chhattisgarh), Orissa, Punjab, Rajasthan, and Uttar Pradesh (includes Uttaranchal).

Our outcome variable is the education gap between siblings, measured as the difference in educational attainment (years of schooling) between the eldest daughter and the eldest son.

Identification strategy

The identification strategy used is similar to the work of Deininger et al. (2013) and Roy (2015). We are using the fact that, in order to be considered 'treated', a girl must be born in a reformed state and be young enough to be affected. Specifically, the treated group is composed of girls who were 10 years old or younger at the time of the reform in their state. This group is expected to be most impacted in terms of education, as these women were not yet of school age at the time of the amendment or were still at an early stage in their schooling: parents were prone to take the amendments into account when considering their daughters' education decision. For instance, a Hindu girl born in 1980 in the state of Andhra Pradesh, where the reform came in 1986 will be 6 years old at the time of the reform, so she is considered likely to be affected by the amendment and hence belongs to the treated group.

To assess the long-term effects, we divide the treated sample into three cohorts:

- *Most treated (10 years or younger)*: Girls who were 10 years old or younger when the amendment passed.
- *Partially treated (11-15 years old)*: Some girls in this cohort may have already completed schooling or were married at the time of the reform.

- *Least treated (16-20 years old)*: Most girls in this cohort were likely out of school and married by the time of the reform, making them least affected by the amendment (for Falsification check)
- *Omitted group*: Girls who were 21 years old or older at the time of the reform in reform states and girls of all ages from states that did not amend the HSA.

Since land is a critical asset in India and primarily inherited within families, girls from landed households are more likely to benefit from the reform. Therefore, we employ a triple-difference strategy incorporating land ownership to assess the reform's effects specifically on landed households. The main identifying assumption is that, in the absence of the inheritance law reform, the gender gap in education would have followed a similar linear trend across both reform and non-reform states. We test for this using a parallel trends assumption, showing that no significant differences existed in the gender gap between reform and non-reform states prior to the reforms.

Methodology

To empirically test the impact of the amendments, we define age cohorts. The regression is expressed in Equation (1):

$$EduGap_{isk} = \alpha_s + \beta_k + \gamma_s k + \delta_1 D1 + \delta_2 D2 + \delta_3 D3 + \delta'_1 D1 * Land + \delta'_2 D2 * Land + \delta'_3 D3 * Land + \mu Land + X_i + u_{isk} \ldots.(1)$$

$EduGap_{isk}$ is the gender gap in education, for a pair of siblings (sister and brother) in household *i*, state *s*, birth cohort *k* (girl's birth year). $\delta'_1, \delta'_2, \delta'_3$ are the coefficients of interest: they capture the effects of belonging to a certain age cohort in a reformed state and of being from a household owning land. *D1* equals 1 if the sister was ≤ 10 years at the time of reform, D2 accounts for sisters who were 11-15 years at the time of the reform, and D3 for the 16- to 20-year-old cohort. Then, α_s is the state-fixed effect controlling for any state-specific characteristics, absorb time-invariant cultural or policy traits across states. β_k is a year-of-birth fixed effect, absorb overall trends in education across time. While $\gamma_s k$ captures state-specific linear trends by year of birth, allow education levels to trend differently across states for reasons unrelated to the reform and u_{isk} is the error term, clustered at the state level to account for correlation in treatment assignment. X_i is a vector that includes a rich set of household- and sibling-level controls, such as an indicator for urban area, the number of siblings, brother's age,

highest educational attainment of parents, father's and mother's age, caste, standard of living, birth orders, and NFHS rounds. The dummy variable, Land, captures the effect of belonging to a household that owns land, as emphasized previously.

Parallel trend assumption

The parallel trend assumption is crucial to ensuring that the effects of the inheritance law reforms can be correctly attributed to legal changes rather than pre-existing trends. The identifying assumption in a differences analysis is that, controlling for observables, trends in the evolution of the educational gap between brothers and sisters would have been the same for girls in reform and non-reform states across landholding and age cohorts in the absence of reform.

To assess whether this assumption holds, we implement an "event study" like approach leveraging household and cohort-level data. Specifically, we estimate a regression of the following form:

$$EduGap_{isk} = \beta_0 + \sum_{t=1}^{6} \beta_t \cdot T_{isk} + \beta_7 \cdot Land\_Ownership_{isk} + \sum_{\tau=1}^{6} \beta_{1\tau} \cdot (T_{isk} \times Land\_Ownership_{isk}) + X_i \cdot \theta + \alpha_s + \beta_k + u_{isk}$$

where, $EduGap_{isk}$ represents the educational gap between brothers and sisters in household *i*, state *s*, birth cohort *k*.

T refers to dummies for age cohorts at the time of the reform (grouped as T1 to T6).

T_1: 10 Years or Younger

T_2: 11-15 Years

T_3: 16-20 Years

T_4: 21-25 Years

T_5: 26-30 Years

T_6: 31-35 Years

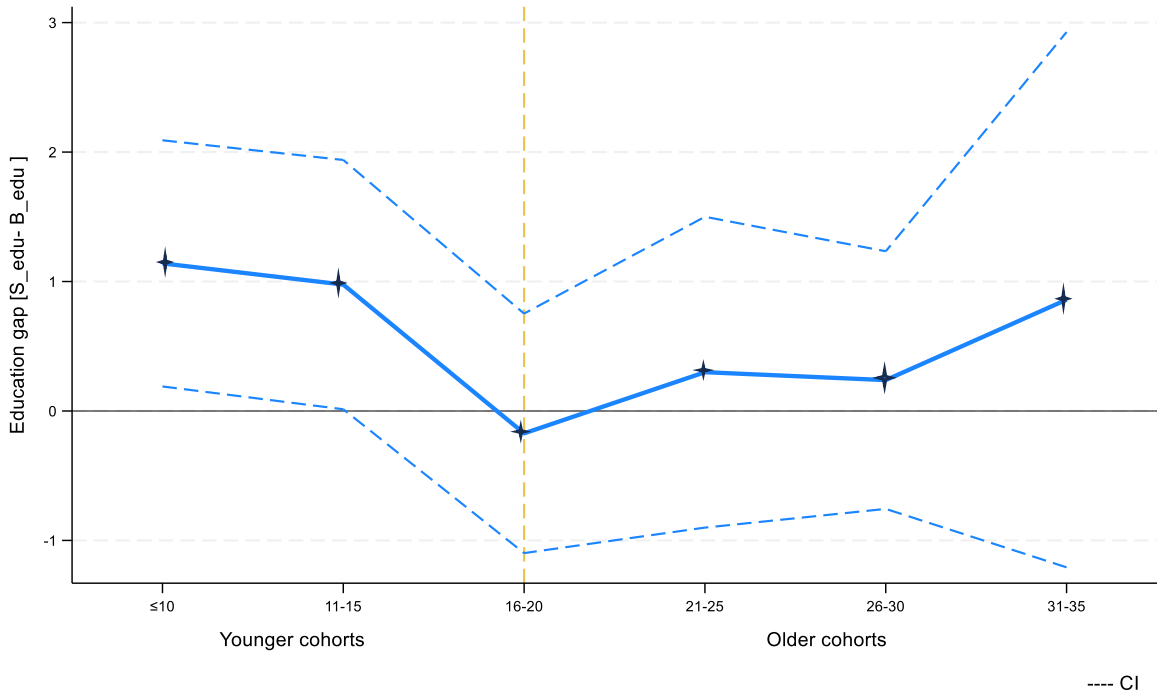
Base: All cohorts (in Non-reform states) + Age >35 at time of reform in reform states

Land_Ownership captures whether the household owns land.

$\beta_{1\tau}$ s captures the coefficient of triple DID (plotted in Figure 2)

Figure 2. displays the estimated effects of the reform across different age cohorts relative to a baseline group. The younger cohorts (T1, T2, and T3) represent those who were exposed to the reform during their formative years (under 20 years old), while the older cohorts (T4, T5, T6) represent individuals who were less likely to have been directly impacted by the reforms.

Figure 2. Plot of coefficients of DDD term for testing Parallel trend assumption



Insignificant coefficients for older cohorts (T4, T5, T6) indicate that no significant changes in the educational gap occurred before the reform. This supports the parallel trend assumption, as it shows that the differences between the reform and non-reform states were not present before the policy change. Therefore, any changes in the educational gap seen in the younger, treated cohorts (T1, T2) can be attributed to the inheritance law reforms rather than pre-existing trends.

To test the validity of our empirical strategy, we also conduct a falsification test. We estimate equation (1) for the non-Hindu [Muslim and Christians] population who were unaffected by the HSA. The coefficient on the treatment variable is not statistically significant. These findings lend support to the use of our model (See Table A1 in appendix).

Empirical Results

Descriptive statistics

Descriptive statistics for the sample are presented in Table 1. On average, the education gap between sisters and brothers is -1.89 years, where sisters have 7.8 years of schooling compared to 9.69 years for brothers. This gap is more pronounced in non-reform states. Across all cohorts, the education gap (Sisters' education – Brothers' education) is negative, indicating that girls typically receive less education than boys. However, in the reform states, the gap narrows for the younger treated cohorts. Specifically, for the ≤ 10 and 11-15 cohorts, the gap becomes smaller, even turning positive (0.121), suggesting that sisters in these groups are catching up or even surpassing brothers in education. For older cohorts, however, the gap remains wider, favoring brothers.

The years of schooling for sisters show improvements in reform states, particularly among the younger cohorts (10.17 for the youngest). The pattern suggests that the reform likely increased educational investments in sisters. For brothers, the years of education remain relatively stable across all cohorts, showing less variation between reform and non-reform states. Brothers seem to have consistently higher levels of education across all groups.

In terms of parental education, parents in reform states tend to have more schooling, with mothers' education highest among the youngest cohort. Additionally, brothers tend to be older than sisters across all groups. Other variables such as land ownership show lower levels in reform states, while the proportion of urban households is higher. The SC/ST (Scheduled Castes/Scheduled Tribes) percentages remain relatively consistent between reform and non-reform states. Finally, a greater percentage of households in non-reform states report owning durable goods above the median, indicating a higher standard of living.

Regression Results

Table 2 presents the regression estimates of the effect of inheritance law reform on the educational gender gap between siblings, measured by the difference between a sister's and a brother's years of schooling. The coefficients of interaction terms represent the impact of the reform on different age cohorts of women in reform states, compared to the control group (women over 21 at the time of the reform in reform states and all ages in non-reform states), for landowning households.

Table 1. Descriptive Statistics

Variables	All	Non-Reform State	Reform State				
			All	≤ 10	11-15	16-20	>21
Education Gap [*S_edu- B_edu*]	-1.889	-2.135	-1.467	0.121	-0.943	-1.801	-2.681
	(4.593)	(4.691)	(4.388)	(3.800)	(4.089)	(4.242)	(4.630)
S education (in years)	7.802	7.551	8.231	10.17	8.962	8.400	6.346
	(5.741)	(5.949)	(5.338)	(4.427)	(5.147)	(5.435)	(5.370)
B education (in years)	9.691	9.687	9.699	10.05	9.904	10.20	9.026
	(4.709)	(4.763)	(4.617)	(4.080)	(4.320)	(4.591)	(5.061)
S Age	27.60	27.16	28.36	25.36	26.52	27.26	32.20
	(5.800)	(5.504)	(6.202)	(3.728)	(4.009)	(4.443)	(7.502)
B Age	29.39	29.50	29.20	28.15	27.94	28.87	30.84
	(6.052)	(6.083)	(5.994)	(5.374)	(5.050)	(5.707)	(6.677)
F Age	60.57	60.16	61.26	59.09	59.39	60.26	64.45
	(8.444)	(8.367)	(8.531)	(7.633)	(8.089)	(7.852)	(8.840)
M Age	54.07	54.13	53.98	51.83	52.27	52.95	57.08
	(8.137)	(7.977)	(8.404)	(7.394)	(7.653)	(7.549)	(9.065)
F education (in years)	5.815	5.760	5.908	5.975	6.055	6.479	5.426
	(4.665)	(4.884)	(4.262)	(4.155)	(4.322)	(4.477)	(4.121)
M education (in years)	3.002	2.699	3.520	4.485	3.939	3.577	2.566
	(3.943)	(3.907)	(3.952)	(4.058)	(4.222)	(4.014)	(3.445)
Land ownership (%)	0.493	0.554	0.387	0.273	0.332	0.402	0.489
	(0.500)	(0.497)	(0.487)	(0.446)	(0.471)	(0.491)	(0.500)
Total no. of children	3.378	3.487	3.192	3.042	3.126	3.244	3.303
	(1.341)	(1.377)	(1.255)	(1.122)	(1.259)	(1.305)	(1.298)
Urban (%)	0.444	0.402	0.515	0.514	0.543	0.542	0.483
	(0.497)	(0.490)	(0.500)	(0.500)	(0.499)	(0.499)	(0.500)
SC/ST (%)	0.207	0.201	0.216	0.228	0.226	0.226	0.197
	(0.405)	(0.401)	(0.412)	(0.420)	(0.418)	(0.419)	(0.398)
Durables (Above median=1)	0.547	0.584	0.485	0.482	0.557	0.499	0.437
	(0.498)	(0.493)	(0.500)	(0.500)	(0.497)	(0.500)	(0.496)
S birth order	1.802	1.863	1.699	1.896	1.719	1.743	1.521
	(0.819)	(0.831)	(0.786)	(0.811)	(0.771)	(0.798)	(0.730)
B birth order	1.452	1.408	1.527	1.363	1.474	1.499	1.690
	(0.601)	(0.580)	(0.628)	(0.569)	(0.579)	(0.641)	(0.651)
Observations	6,531	4,126	2,405	589	470	513	833

Notes: S-sister; B-Brother; F-Father; M-Mother

The results show that for women aged 10 or younger at the time of the reform (the 'most treated' group), the education gap narrows significantly in landowning households. Across specifications, these gap narrows down in treated group by 1.1 to 1.7 years of education compared to the control group, with the coefficients being significant at the 5% level. Similarly, women aged 11-15 at the time of the reform (the 'partially treated' group) also exhibit a smaller education gap in landowning households, with 0.96 to 1.14 more years of education compared to the control group, and these effects are significant at the 5% level.

As expected, women aged 16-20 at the time of the reform (the 'least treated' group) show no significant effect across any specification. Since their education decisions would have been less influenced by the reform, given that many in this cohort were likely already married or out of school at the time of the reform. This pattern provides additional confidence in the empirical strategy, as insignificant findings for the least exposed cohort support the validity of the identification assumptions. Interestingly, the results also show that land ownership itself has a significant negative association with the gender gap, indicating that in households that own land, the gender gap widens, and brothers receive relatively more education than their sisters in the absence of the reform.

All specifications control for state and birth year fixed effects. Including state-specific linear trends in column 2 does not change the significance of the results. In column 3, the model introduces controls for parental education and age, sibling characteristics, urban residence, and socioeconomic status. Notably, higher parental education—especially the mother's—correlates with a smaller education gap. Being in an urban area and having a higher birth order position are also linked to a reduction in the gender gap. Finally, in column 4, state-by-year-of-birth fixed effects are included, and the results remain robust.

The positive and significant coefficients in Table 2 may suggest that the gap between siblings is widening. To establish that the gap is indeed closing and not that sisters are surpassing brothers, we modify our outcome variable and run two separate regressions.

The results presented in Table 3 illustrate the differential effects of land ownership and age at the time of inheritance law reforms on the educational gap between sisters and brothers, separately for when the gap is positive and when the gap is negative.

For column (1) through (4), we define Education gap as:

$$Edugap = \begin{cases} S\_edu - B\ edu\ , \ if\ S\_edu > B\_edu \\ 0 \qquad\qquad , \ otherwise \end{cases}$$

For Column (5) through (8),

$$Edugap = \begin{cases} S\_edu - B\ edu\ , \ if\ S\_edu < B\_edu \\ 0 \qquad\qquad , \ otherwise \end{cases}$$

Table 2. Impact of inheritance law reform on Education gap (in years) among siblings: Triple differences by land.

Y: Education gap [*S_edu - B_edu*]	(1)	(2)	(3)	(4)
Age ≤ 10 at reform × Owns land	**1.648****	**1.636****	**1.086****	**1.137****
	(0.657)	**(0.638)**	**(0.418)**	**(0.391)**
Age 11–15 at reform × Owns land	**1.094***	**1.144****	**0.962****	**1.124****
	(0.537)	**(0.510)**	**(0.409)**	**(0.378)**
Age 16–20 at reform × Owns land	-0.077	-0.071	-0.217	-0.048
	(0.466)	(0.451)	(0.361)	(0.450)
Age ≤ 10 at reform	-0.004	0.024	-0.075	-2.250***
	(0.523)	(0.646)	(0.667)	(0.153)
Age 11–15 at reform	-0.408	-0.490	-0.376	-3.740***
	(0.506)	(0.676)	(0.651)	(0.161)
Age 16–20 at reform	-0.047	-0.092	-0.120	-2.380***
	(0.319)	(0.368)	(0.368)	(0.183)
Owns land	-1.702***	-1.690***	-0.891***	-0.889***
	(0.425)	(0.413)	(0.281)	(0.285)
Controls				
Father's education			0.038*	0.035*
			(0.018)	(0.018)
Mother's education			0.135***	0.136***
			(0.017)	(0.017)
Father's age			-0.014	-0.015
			(0.016)	(0.016)
Mother's age			0.015	0.017
			(0.014)	(0.014)
Brother's age			0.067***	0.069***
			(0.019)	(0.021)
No. of siblings			-0.082	-0.133**
			(0.046)	(0.051)
Durables (Above median=1)			0.201	0.224
			(0.139)	(0.136)
Belonging to ST/SC			-0.115	-0.082
			(0.073)	(0.071)
Urban			1.045***	1.006***
			(0.203)	(0.217)
S's birth order			0.508***	0.503***
			(0.158)	(0.149)
B's birth order			0.560***	0.550***
			(0.153)	(0.168)
Constant	Yes	Yes	Yes	Yes
NFHS Rounds	No	No	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
State Linear trends	No	Yes	Yes	No
State x Year of birth fixed effects	No	No	No	Yes
Adj R-squared	0.132	0.134	0.186	0.203
Observations	6,610	6,610	6,531	6,531

Notes: Standard errors are in parentheses and clustered at the state level. The control age group is >21 in reform states and all ages in non-reform states. *** p<0.01, ** p<0.05, * p<0.1

Columns (1) through (4) show the effect on the education gap when the gap is positive, indicating that sisters are more educated than their brothers. For daughters who were aged 10 or younger at the time of the reform and whose families owned land, there is no statistically significant effect on the positive education gap, as seen by the small and insignificant

coefficients across columns (1) to (4). This suggests that for girls in this group, the reform did not lead to a substantial increase in their educational advantage over their brothers. Similarly, for girls aged 11-15 or 16-20 at the time of the reform, the coefficients remain insignificant, implying no significant improvement in their educational standing compared to their brothers.

Table 3. Impact of inheritance law reform on Education gap between siblings (when gap is positive and when gap is negative).

Y: Education gap [*S_edu- B_edu*]	*if, S_edu-B_edu > 0* *0 otherwise*				*if, S_edu-B_edu < 0* *0 otherwise*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Age ≤ 10 at reform × Owns land	0.342	0.377	0.256	0.317	**1.306*** **	**1.259*** **	**0.830** **	**0.820** **
	(0.293)	(0.300)	(0.241)	(0.248)	**(0.423)**	**(0.410)**	**(0.314)**	**(0.301)**
Age 11–15 at reform × Owns land	0.110	0.122	0.054	0.114	**0.983** **	**1.022** **	**0.908*** **	**1.010*** **
	(0.206)	(0.205)	(0.186)	(0.154)	**(0.376)**	**(0.359)**	**(0.277)**	**(0.270)**
Age 16–20 at reform × Owns land	-0.192	-0.185	-0.195	-0.138	0.114	0.114	-0.022	0.089
	(0.190)	(0.192)	(0.170)	(0.215)	(0.370)	(0.359)	(0.306)	(0.359)
Age ≤ 10 at reform	0.272	0.021	-0.003	0.013	-0.276	0.003	-0.072	-2.263***
	(0.166)	(0.242)	(0.235)	(0.059)	(0.425)	(0.608)	(0.636)	(0.113)
Age 11–15 at reform	-0.044	-0.169	-0.130	-0.510***	-0.364	-0.321	-0.245	-3.230***
	(0.136)	(0.108)	(0.091)	(0.068)	(0.412)	(0.647)	(0.629)	(0.112)
Age 16–20 at reform	0.061	-0.009	-0.021	-0.729***	-0.108	-0.083	-0.099	-1.651***
	(0.130)	(0.131)	(0.109)	(0.081)	(0.232)	(0.340)	(0.357)	(0.133)
Owns land	-0.319**	-0.319**	-0.138	-0.153	-1.384***	-1.371***	-0.753***	-0.736***
	(0.111)	(0.109)	(0.085)	(0.092)	(0.336)	(0.327)	(0.225)	(0.222)
Controls	No	No	Yes	Yes	No	No	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NFHS Rounds	No	No	Yes	Yes	No	No	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Linear trends	No	Yes	Yes	No	No	Yes	Yes	No
State x Year of birth fixed effects	No	No	No	Yes	No	No	No	Yes
Adj R-squared	0.0481	0.0483	0.0670	0.0612	0.128	0.131	0.181	0.203
Observations	6,610	6,610	6,531	6,531	6,610	6,610	6,531	6,531

Notes: Standard errors are in parentheses and clustered at the state level. S stands for sister and B stands for Brother
Controls as shown in Table 2. *** p<0.01, ** p<0.05, * p<0.1

In contrast, columns (5) to (8) highlight the cases where the education gap is negative, meaning brothers have more education than their sisters. In these cases, a positive coefficient indicates that the gap is narrowing, or the brothers' educational advantage is shrinking. For instance, in column (5), the coefficient of 1.306 for girls aged 10 or younger at the time of the reform in landowning families indicates that the educational gap favoring brothers is significantly reduced. This finding is consistent across columns (6) and (7), with similarly strong positive coefficients for girls aged 10 and 11-15, reinforcing the idea that reforms have a stronger impact on reducing the brothers' educational advantage in landowning households. The results for older cohorts (16-20 at the time of reform) are again insignificant as expected.

Table 4. Impact of inheritance law reform on Education gap within reform states by land

Y: Education gap [*S_edu-B_edu*]	*S_edu-B_edu*	*if , S_edu-B_edu > 0* *0 otherwise*	*if , S_edu-B_edu < 0* *0 otherwise*
	(1)	(2)	(3)
Age ≤ 10 at reform × Owns land	**1.087***	0.122	**0.965****
	(0.411)	(0.246)	**(0.323)**
Age 11–15 at reform × Owns land	**1.011****	-0.105	**1.116*****
	(0.351)	(0.171)	**(0.215)**
Age 16–20 at reform × Owns land	-0.128	-0.340	0.212
	(0.408)	(0.229)	(0.281)
Age ≤ 10 at reform	-0.064	1.655***	-1.719***
	(0.486)	(0.325)	(0.201)
Age 11–15 at reform	-0.195	1.383***	-1.578***
	(0.328)	(0.136)	(0.234)
Age 16–20 at reform	0.862***	0.957***	-0.095
	(0.093)	(0.040)	(0.067)
Owns land	-0.873**	0.018	-0.891***
	(0.222)	(0.049)	(0.183)
Controls	Yes	Yes	Yes
Constant	Yes	Yes	Yes
NFHS Rounds	Yes	Yes	Yes
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
State Linear trends	No	No	No
State x Year of birth fixed effects	Yes	Yes	Yes
Adj R-squared	0.158	0.0427	0.171
Observations	2,405	2,405	2,405

Notes: Standard errors are in parentheses and clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1.
Controls as shown in Table 2.

Overall, these findings suggest that the Hindu Succession Act reforms had a more pronounced effect on narrowing the educational gap between brothers and sisters in households that owned land, particularly for younger cohorts who were likely to benefit most from the reforms.

To probe the consistency and internal validity of the main findings, we conduct an additional analysis restricting the sample to reform states only. This difference-in-differences framework compares educational gender gaps across age cohorts and landholding status within reform states, removing non-reform states from the analysis. Results are reported in Table 4. We examine the impact of the inheritance law reform on the education gap within reform states, utilizing a Difference-in-Differences (DID) estimation. This specification incorporates two key sources of variation: cohort (by age at the time of the reform) and land ownership status. Even under this stricter definition of treatment, the results remain robust. The interaction term for daughters aged ≤ 10 at the time of reform and land ownership shows a significant and positive coefficient (1.087, significant at 10%), indicating a considerable increase in their educational attainment relative to their brothers. Similarly, daughters aged 11–15 at the time of the reform also experienced a significant positive impact (1.011, significant at 5%).

Robustness checks using only reform states confirm that results are not driven by compositional differences between reform and non-reform states. This suggests that younger daughters from landowning families who were exposed to the reform saw significant educational benefits. The consistency of these effects within reform states reinforces the argument that the inheritance reform was a pivotal factor driving improved educational outcomes for daughters, particularly among the younger, more treated cohorts.

In columns (2) and (3), we provide a breakdown based on whether the education gap favors the sister or the brother. While no significant effects are observed for positive gaps (column 2), the results in column (3) show that reforms helped reduce the disadvantage for sisters where they had lower educational outcomes compared to their brothers. For instance, daughters aged ≤10 and 11–15 at the reform saw reductions in this educational disadvantage by 0.96 and 1.11 units, respectively (significant at 5% & 1% levels, respectively). This also confirms that the gender gap in education is narrowing even within the reform states, highlighting the direct and equitable impact of the inheritance law reforms on gender parity in educational outcomes among siblings within the household.

Table 5. Impact of inheritance law reform on Education gap by land including federal reform of 2005

Y: Education gap [*S edu- B edu*]	(1)	(2)	(3)	(4)
Age ≤ 10 at reform × Owns land	**1.266*****	**1.137*****	**0.959*****	**0.958*****
	(0.397)	(0.370)	(0.296)	(0.284)
Age 11–15 at reform × Owns land	**1.116*****	**0.997*****	**0.924*****	**0.974*****
	(0.322)	(0.295)	(0.237)	(0.218)
Age 16–20 at reform × Owns land	0.477	0.389	0.344	**0.407****
	(0.296)	(0.276)	(0.214)	(0.181)
Age ≤ 10 at reform	-0.329	-0.429	-0.266	-0.469***
	(0.350)	(0.349)	(0.304)	(0.157)
Age 11–15 at reform	-0.477	-0.584	-0.610*	-0.606***
	(0.314)	(0.341)	(0.298)	(0.120)
Age 16–20 at reform	-0.087	-0.157	-0.151	0.728***
	(0.179)	(0.198)	(0.162)	(0.111)
Owns land	-1.771***	-1.679***	-1.120***	-1.149***
	(0.368)	(0.350)	(0.240)	(0.227)
Controls	No	No	Yes	Yes
Constant	Yes	Yes	Yes	Yes
NFHS Rounds	No	No	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
State Linear trends	No	Yes	Yes	No
State x Year of birth fixed effects	No	No	No	Yes
Adj R-squared	0.0942	0.0975	0.143	0.148
Observations	41,493	41,493	40,977	40,977

Notes: Standard errors are in parentheses and clustered at the state level.

Controls same as shown in Table 2. *** p<0.01, ** p<0.05, * p<0.1

Table 5 shows the results of the impact of inheritance law reforms, including the federal reform of 2005, on the education gap between siblings, considering land ownership. This analysis also uses a Difference-in-Differences (DID) approach. Here, we estimate the effect of inheritance law reform, including the two latest rounds of NFHS, i.e., NFHS 4 (2015-16) and NFHS 5 (2019-21). This helps us to incorporate the effects of federal reform, the Hindu Succession Amendment Act of 2005. The federal amendments were applicable to all women

(Married and unmarried)[6] and all states. In contrast to the state reforms, which were applicable only to the women who were unmarried at the time of the reform. Thus, now all the states are the reform states. We apply DID given the variation in cohorts and the land ownership. We still find qualitatively similar and significant results as earlier. The younger cohorts (<= 10 and 11-15) have the gaps closing in relation to their male sibling. In column (4), the effect for the 16-20 cohort also became significant. This could be possible since the federal reform was applicable to both married and unmarried daughters, so they could bargain for higher educational investment even at a later age. While control group contamination remains a concern post-2005, as older cohorts may now also benefit from the federal amendment, our estimates primarily reflect differences in intensity of exposure across cohorts.

While our primary analysis demonstrates that inheritance reforms reduce the gender gap in education among siblings, it remains important to pinpoint at which specific level of educational attainment these improvements are most pronounced. Focusing solely on years of schooling may obscure whether the gender gap closes at elementary (i.e. upto 8th standard) or higher educational levels.

To address this, we conduct a subsample analysis by the brother's completed education level within the sibling pair. By segmenting the sample according to whether the eldest brother achieved elementary or higher than elementary education, we systematically test whether the likelihood of the sister reaching parity (completing the same level) increases post-reform. Table 6 presents estimates of the effect of inheritance law reforms on the educational gender gap between sisters and brothers, stratified by the brother's education level. The effect of inheritance reform is most pronounced in sibling pairs where the brother achieves education beyond elementary school (above 8th grade). For girls who were 10 years old or younger at the time of the reform, the sibling gender gap narrows significantly by 1.68 years (Column 2: 1.679, $p<0.01$) and by 1.23 years (Column 4: 1.230, $p<0.01$) when the gap is negative, indicating substantial catch-up by sisters. Similarly, for girls aged 11–15 at reform, the gap narrows by 2.14 years and 1.70 years respectively (Columns 2 and 4), both highly significant.

The findings suggest that legal empowerment shifted parental investment behavior well beyond the most basic educational thresholds, enabling sisters to catch up with their brothers' attainment at the higher education levels.

[6] The property must not have been partitioned before the amendment (2005) for these rights to be enforceable.

Table 6: Impact of Inheritance Law Reforms on educational gender gap by Brother's educational level

Y: Education gap [S_edu- B_edu]	*B_edu* <= Elementary (upto 8th std)	*B_edu*> Elementary	*B_edu* >Elementary	
			S_edu- B_edu > 0	*S_edu- B_edu* < 0
	(1)	(2)	(3)	(4)
Age ≤ 10 at reform × Owns land	0.705	**1.679*****	0.449	1.230***
	(0.517)	(0.428)	(0.468)	(0.384)
Age 11–15 at reform × Owns land	-0.137	**2.139*****	0.442*	1.697***
	(0.718)	(0.673)	(0.217)	(0.530)
Age 16–20 at reform × Owns land	-0.328	0.014	-0.121	0.135
	(0.444)	(0.680)	(0.224)	(0.581)
Age ≤ 10 at reform	3.061***	-5.280***	-2.328***	-2.953***
	(0.222)	(0.139)	(0.084)	(0.128)
Age 11–15 at reform	-0.032	-5.953***	-1.421***	-4.532***
	(0.437)	(0.184)	(0.056)	(0.175)
Age 16–20 at reform	2.174***	-3.607***	-1.193***	-2.414***
	(0.247)	(0.186)	(0.066)	(0.162)
Owns land	-0.449	-0.907***	-0.154*	-0.753***
	(0.337)	(0.225)	(0.080)	(0.182)
Controls	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
NFHS Rounds	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year of birth FE	Yes	Yes	Yes	Yes
State x Year of birth fixed effects	Yes	Yes	Yes	Yes
Adj R-squared	0.211	0.345	0.061	0.362
Observations	2,856	3,675	3,675	3,675

Notes: Standard errors are in parentheses and clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1
Controls are same as in Table 2.

Next, we turn to examine the differential impact of the inheritance law reform on the gender gap in education, focusing on how this effect varies by key household and parental characteristics specifically, mother's education, father's education, household wealth (proxied by ownership of durables), and SC/ST status (See Table A2 in appendix). The table presents interaction terms between the reform, land ownership, and these subgroup variables to capture heterogeneous effects.

The results reveal important nuances: for children aged 10 or younger at the time of reform, households where mothers have education beyond the primary level experience a significant positive effect. This suggests that in the households where the mother had higher education, the reform contributed to closing the gender gap in education. Similarly, wealthier

households[7], identified by ownership of durables above the median, also show a significant positive interaction for the younger cohort, indicating that greater household resources amplify the reform's positive impact on reducing educational gender disparities.

In contrast, father's education or the SC/ST status does not significantly modify the reform's effect on the gender gap. These findings highlight that though the inheritance law reform broadly aims to reduce gender inequality in education, its effectiveness is contingent on household socio-economic factors. Educated mothers and household wealth appear to be crucial facilitators for closing the gender gap, especially among younger children at the time of reform, whereas father's education and caste identity do not show an appreciable differential impact.

Robustness

Education gap by level of education

We use an alternative definition of outcome variable by measuring education gap by difference in level of education instead of by years of schooling. We define education levels as 0- No education, 1- some education, 2- finished Primary education, 3- finished middle school, 4- finished secondary school, 5- finished senior secondary, 6- Graduation and above. The results are presented in Table 7.

We find the results to be qualitatively same as earlier. The reform is found to have increased mean educational gap of women belonging to the 'most treated' group by 0.443 units relative to control group, significant at 5% level. The impact on those belonging to the 'partially treated' group is 0.378 units, statistically significant at 5% too, while that the 'least treated' group is negative and insignificant.

Average Sibling Education Gap

We measure the outcome variable as the difference between the average educational attainment of all the sisters and brothers older than 21 years. So, it captures the intra-household education gap based on gender. Across all specifications, the results are robust, indicating that the findings are not limited to the gap between the eldest daughter and son. Instead, on average, daughters are closing the educational gap with their brothers (See Table 8).

[7] The positive interaction effect for household durables should be interpreted cautiously, as durables data were collected at survey time and may not reflect wealth status at reform. Additionally, this result is significant only at the 10% level.

Table 7. Impact of inheritance law reform on education gap (measured by difference in levels of education)

Y: Education gap [*S_edulvl-B_edulvl*]	*S_edulvl-B_edulvl*	*if , S_edulvl-B_edulvl > 0 0 otherwise*	*if , S_edulvl-B_edulvl < 0 0 otherwise*
	(1)	(2)	(3)
Age ≤ 10 at reform × Owns land	**0.443****	0.105	**0.338****
	(0.163)	(0.081)	**(0.124)**
Age 11–15 at reform × Owns land	**0.378****	0.019	**0.359*****
	(0.156)	(0.051)	**(0.115)**
Age 16–20 at reform × Owns land	-0.010	-0.079	0.069
	(0.148)	(0.079)	(0.113)
Age ≤ 10 at reform	-0.643***	0.215***	-0.858***
	(0.058)	(0.023)	(0.044)
Age 11–15 at reform	-1.307***	-0.155***	-1.151***
	(0.067)	(0.024)	(0.050)
Age 16–20 at reform	-0.849***	-0.171***	-0.679***
	(0.065)	(0.029)	(0.047)
Owns land	-0.345***	-0.068*	-0.277***
	(0.107)	(0.036)	(0.083)
Controls	Yes	Yes	Yes
Constant	Yes	Yes	Yes
NFHS Rounds	Yes	Yes	Yes
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
State x Year of birth fixed effects	Yes	Yes	Yes
Adj R-squared	0.191	0.0506	0.196
Observations	6,531	6,531	6,531

Notes: Standard errors are in parentheses and clustered at the state level. *** p<0.01, ** p<0.05, * p<0.1
Controls are same as in Table 2.

Sample Selection in Analysis of Daughters' Educational Outcomes

The analysis of intergenerational gender gaps in education using household survey data requires careful attention to sample selection, particularly in the context of tracking daughters who may have left the parental household due to marriage or other demographic events. Here, we implement a multi-pronged strategy to address and document these selection issues, leveraging both the structure of the NFHS data and supplementary survey sources.

Table 8. Impact of Inheritance Law Reform on Average Sibling Education Gap

Y: Education gap [Mean *Ss edu - Mean Bs edu*]	(1)	(2)	(3)	(4)
Age ≤ 10 at reform × Owns land	**1.661****	**1.644****	**1.050****	**1.104****
	(0.634)	**(0.618)**	**(0.395)**	**(0.383)**
Age 11–15 at reform × Owns land	**1.087***	**1.122***	**0.895***	**1.071****
	(0.565)	**(0.546)**	**(0.446)**	**(0.384)**
Age 16–20 at reform × Owns land	0.027	0.023	-0.175	0.052
	(0.414)	(0.403)	(0.310)	(0.404)
Age ≤ 10 at reform	-0.002	-0.001	-0.061	-2.388***
	(0.525)	(0.663)	(0.669)	(0.132)
Age 11–15 at reform	-0.353	-0.451	-0.341	-3.739***
	(0.491)	(0.644)	(0.605)	(0.146)
Age 16–20 at reform	-0.015	-0.071	-0.044	-1.364***
	(0.304)	(0.382)	(0.356)	(0.161)
Owns land	-1.783***	-1.768***	-0.936***	-0.959***
	(0.410)	(0.398)	(0.266)	(0.276)
Controls	No	No	Yes	Yes
Constant	Yes	Yes	Yes	Yes
NFHS Rounds	No	No	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
State Linear trends	No	Yes	Yes	No
State x Year of birth fixed effects	No	No	No	Yes
Adj R-squared	0.142	0.145	0.198	0.214
Observations	6,620	6,620	6,561	6,561

Notes: Standard errors are in parentheses and clustered at the state level.
Controls are same as in Table 2. *** p<0.01, ** p<0.05, * p<0.1

Excluding Divorced and Separated Daughters

As NFHS collects information on all daughters present in the household, our sample can include daughters who are divorced or separated and have returned to the parental home. To ensure that our results are not disproportionately driven by this subgroup. The daughters who are divorced or separated at the time of the survey could be potentially already empowered at a young age and could potentially affect the results. We perform robustness checks, excluding divorced and separated daughters from the sample. The results remain qualitatively unchanged: the narrowing of the sibling educational gap persists among the main treated cohorts,

strengthening confidence that our findings are not artifacts of selective return migration or adverse events among this subgroup (Table 9, Column 1)

Subsample Analysis by Marital Status

Given patrilocal residence norms and the average marriage age for women in India, sample selection also arises because NFHS observes only daughters currently residing in the parental household. To probe the implications, we conduct subsample analyses by marital status at the time of survey (married vs. unmarried). For married daughters, reform effects on educational gaps remain strong and significant, indicating our results are not driven by the unmarried daughters who are self-selecting for further studies (Table 9, Column 2).

Among unmarried daughters, the treatment effect is pronounced for the youngest (≤10 at reform), as expected, but negative for the 16–20 age group, consistent with selection bias: older unmarried daughters still at home are likely to be a negatively selected, disadvantaged subset not representative of their whole cohort (Table 9, Column 3). Recognizing and transparently reporting this heterogeneity is critical for interpretation and external validity.

Validation Using REDS Data: All Daughters Born to the Household Head

To further address limitations imposed by the NFHS's residency-based sampling frame, we supplement our analysis with data from the Rural Economic and Demographic Survey 1999 (REDS 99), which enumerates all daughters ever born to the household head, regardless of their current place of residence or marital status. This allows us to capture fully the universe of daughters, mitigating bias from unobserved out-migrants and overcoming the selection inherent in household roster data. Notably, when replicating our main specifications on the REDS sample, we observe results consistent with those from the NFHS after robust adjustment—significant reductions in the sibling education gap among treated cohorts (Table 9, Column 4).

Other forms of Assets

Our primary focus is on the role of land ownership in closing the educational gender gap, and we aim to confirm that other forms of assets are not driving the results. To test this, we investigated whether house ownership or ownership of durable goods also contributed to the narrowing of the gap.

We used a model based on house ownership, using data from NFHS-2 and NFHS-3 (House ownership information is available from NFHS-2.). As shown in Table 10, we found no significant results related to house ownership.

Table 9. Impact of inheritance law reform on the education of Hindu women: Addressing Sample Selection Issues

	Divorced/Separated	Married	Unmarried	REDS-99
Y: Education gap [*S edu- B edu*]	(1)	(2)	(3)	(4)
Age ≤ 10 at reform × Owns land	**1.319****	**0.762***	**1.808***	**2.524*****
	(0.446)	(0.403)	(0.907)	(0.601)
Age 11–15 at reform × Owns land	**1.301*****	**1.186***	-1.417	0.576
	(0.359)	(0.621)	(0.843)	(1.504)
Age 16–20 at reform × Owns land	-0.045	0.789	**-0.903***	1.252
	(0.529)	(0.636)	(0.871)	(0.881)
Age ≤ 10 at reform	-1.990***	-4.639***	0.979*	1.559***
	(0.173)	(0.209)	(0.504)	(0.512)
Age 11–15 at reform	-3.084***	-3.535***	0.757	1.826**
	(0.163)	(0.308)	(0.718)	(0.842)
Age 16–20 at reform	-1.881***	-2.368***	-0.899*	0.883
	(0.232)	(0.279)	(0.473)	(0.541)
Owns land	-0.878**	-0.991***	-0.448	-0.538
	(0.313)	(0.333)	(0.307)	(0.598)
Controls	Yes	Yes	Yes	Yes
Constant	Yes	No	No	Yes
NFHS Rounds	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
State Linear trends	No	No	No	No
State x Year of birth fixed effects	Yes	Yes	Yes	Yes
Adj R-squared	0.207	0.172	0.110	0.076
Observations	6,092	3,690	2840	3,126

Notes: Standard errors are in parentheses and clustered at the state level.
Controls are same as in Table 2. *** p<0.01, ** p<0.05, * p<0.1

Next, we constructed a variable for durable goods ownership (e.g., TV, car, motorbike, bicycle, water pump), categorizing households with durable goods ownership above the median as 1, and below the median as 0. When we examine the direct effect of the inheritance law reform by interacting the reform variable with household durables in the triple-difference framework, we do not observe a significant impact on the educational gender gap. However,

when we introduce a higher-order interaction (youngest age cohort at the time of reform × land × durables), the effect becomes significant. This indicates that household durables alone do not mediate the reform's impact, but in combination with land ownership, the presence of more durable assets amplifies the reform's influence on gender disparities in education. Thus, it is specifically the interaction of land ownership and household wealth (as proxied by durables), rather than durables alone, that generates a measurable effect (see table 11).

Table 10. Impact of inheritance law reform on education gap: Triple differences by House ownership

Y: Education gap [*S edu- B edu*]	(1)	(2)	(3)	(4)
Age ≤ 10 at reform × Owns House	0.386	0.339	0.556	0.811
	(0.620)	(0.591)	(0.552)	(0.533)
Age 11–15 at reform × Owns House	-0.639	-0.672	-0.339	-0.331
	(0.413)	(0.415)	(0.497)	(0.536)
Age 16–20 at reform ×Owns House	-0.824	-0.854	-0.630	-0.331
	(0.790)	(0.782)	(0.776)	(0.794)
Age ≤ 10 at reform	0.546	1.053	0.609	-3.556***
	(0.806)	(1.011)	(0.993)	(0.419)
Age 11–15 at reform	0.618	0.989	0.659	-3.814***
	(0.442)	(0.720)	(0.661)	(0.540)
Age 16–20 at reform	0.752	0.997	0.666	0.170
	(0.864)	(0.811)	(0.698)	(0.845)
owns house	-0.599**	-0.580**	-0.131	-0.321
	(0.208)	(0.214)	(0.244)	(0.331)
Controls	No	No	Yes	Yes
Constant	Yes	Yes	Yes	Yes
NFHS Rounds	No	No	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
State Linear trends	No	Yes	Yes	No
State x Year of birth fixed effects	No	No	No	Yes
Adj R-squared	0.101	0.103	0.179	0.189
Observations	4,545	4,545	4,483	4,483

Notes: Standard errors are in parentheses and clustered at the state level.

Controls same as in Table 2. *** p<0.01, ** p<0.05, * p<0.1

Table 11. Impact of inheritance law reform on education gap: triple differences by Durables

Y: Education gap [*S edu- B edu*]	(1)	(2)	(3)	(4)
Age ≤ 10 at reform × Durables	-0.813	-0.802	-0.497	-0.613
	(0.647)	(0.629)	(0.484)	(0.456)
Age 11–15 at reform × Durables	-0.060	-0.119	-0.078	0.113
	(0.390)	(0.374)	(0.346)	(0.340)
Age 16–20 at reform × Durables	-0.166	-0.171	-0.009	-0.017
	(0.524)	(0.502)	(0.462)	(0.491)
Age ≤ 10 at reform	1.053**	1.135	0.616	-1.607***
	(0.468)	(0.750)	(0.694)	(0.357)
Age 11–15 at reform	0.118	0.100	0.062	-3.359***
	(0.486)	(0.749)	(0.681)	(0.210)
Age 16–20 at reform	0.122	0.080	-0.167	-2.340***
	(0.252)	(0.407)	(0.396)	(0.266)
Durables	1.323***	1.312***	0.267	0.287*
	(0.200)	(0.185)	(0.156)	(0.158)
Controls	No	No	Yes	Yes
Constant	Yes	Yes	Yes	Yes
NFHS Rounds	No	No	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
State Linear trends	No	Yes	Yes	No
State x Year of birth fixed effects	No	No	No	Yes
Adj R-squared	0.121	0.123	0.184	0.201
Observations	6,614	6,614	6,531	6,531

Notes: Standard errors are in parentheses and clustered at the state level.

Controls same as in Table 2. *** p<0.01, ** p<0.05, * p<0.1

Discussion

This study presents a comprehensive analysis of how inheritance law reforms have impacted the educational gender gap among siblings in India. This study provides strong evidence that inheritance law reforms, particularly in five Indian states that reformed early (Kerala, Andhra Pradesh, Tamil Nadu, Karnataka, and Maharashtra), have significantly contributed to reducing the educational gender gap between male and female siblings. Using a Triple Difference-in-Differences (Triple DID) approach, the results show that daughters, particularly those from landowning households who were 10 years old or younger at the time of the reforms, experienced a substantial increase in educational attainment relative to their brothers thus

closing the gender gap. This suggests that improved property rights for women under the inheritance reforms led to more equitable resource allocation within households, with parents investing more in the education of their daughters alongside the increase in their rights to inherit land.

The findings highlight that legal reforms, even in settings with entrenched social norms and weak enforcement, can have meaningful impacts on gender equity. The reforms had limited effect in terms of physical capital (land inheritance), but our study shows that it shifted intra-household dynamics, leading to an equitable increase in human capital (education) investment in daughters. Importantly, the study finds no evidence of substitution effects, where parents would reduce educational investments in daughters by reallocating the resources from the son. These findings can be understood through both an investment mechanism and a bargaining power mechanism. On the one hand, as daughters gain the legal right to inherit physical capital (land), parents may respond by increasing their investment in daughters' human capital (education), given the broader intergenerational transfer framework as discussed in the appendix. On the other hand, the improved ability to inherit enhances women's bargaining power within households, potentially shifting decisions about educational investments in favor of their preferences (Harari, 2019). This dual mechanism helps explain why inheritance reforms have positively impacted the closing of the educational gender gap for daughters.

Our study differs from previous studies like Deininger et al. (2010) and Roy (2011) in focus and identification strategy. These studies looked at absolute educational attainment by gender. We are focusing on the relative difference between female and male siblings in the same household. Both approaches provide complementary insights: one looks at individual educational outcomes, while the other focuses on within-household gender dynamics in response to the inheritance law reforms. The first approach looks at overall educational attainment but may miss how reforms influence the relative treatment of daughters compared to sons within households.

Previous research shows that the Hindu Succession Amendment Act (HSAA) hasn't necessarily led to more women inheriting joint family property. Although the law grants equal inheritance rights, persistent social norms favor boys, and many families find ways to avoid or undermine the law. In some cases, the reform may have even increased the costs associated with having daughters. Our study consistent with findings in this area shows that women who benefited from the reforms show better human capital outcomes, but this could partly reflect

survivorship bias. Our study highlights that while giving daughters equal inheritance rights didn't produce a strong direct effect on their ownership of joint family property, it did help close the gender gap in investments in education, shift in the parental attitudes towards daughters' economic value, and effectively increase daughters' inheritance in human capital.

Limitations of the study

Despite the robustness of the findings, this study has its limitations. The analysis is limited by the availability of data in the National Family and Health Survey (NFHS). The survey only includes household members present or visiting at the time of the survey, meaning that siblings who have migrated or were absent are not captured in the data. This could lead to under- or over-estimation of the intra-household educational gap if absent siblings differ systematically in their educational outcomes.

Additionally, land ownership status is assessed at the time of the survey, assuming that this status has remained unchanged over time. If this assumption does not hold, it may introduce measurement error, resulting in attenuation bias in our triple-difference estimates.

While our focus on mixed-gender sibling pairs within the same household offers a robust approach to control for unobserved household-specific factors, it is important to acknowledge that our findings may primarily reflect dynamics within families that choose to have both male and female children. If such families systematically differ in unobservable ways from those with only same-gender children (e.g., in their underlying preferences for gender equality, access to resources, or educational aspirations for their children), our results regarding the impact of legal reforms on human capital formation might not be fully generalizable to all household structures.

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Appendix

Table A1. Falsification Check: Impact of inheritance law reform on Education gap of Non-Hindus: Triple differences by land

Y: Education gap [*S edu- B edu*]	*Years* (1)	*Level* (2)
Age ≤ 10 at reform × Owns land	0.051	-0.022
	(0.275)	(0.099)
Age 11–15 at reform × Owns land	0.779	0.282
	(0.616)	(0.260)
Age 16–20 at reform × Owns land	0.904	0.212
	(0.646)	(0.269)
Age ≤ 10 at reform	-0.869*	0.049
	(0.454)	(0.195)
Age 11–15 at reform	3.227***	1.507***
	(0.513)	(0.209)
Age 16–20 at reform	-0.842	0.182
	(0.531)	(0.197)
Owns land	-0.658***	-0.272***
	(0.103)	(0.058)
Controls	Yes	Yes
Constant	Yes	Yes
NFHS Rounds	Yes	No
State FE	Yes	Yes
Year FE	Yes	Yes
State x Year of birth fixed effects	Yes	Yes
Adj R-squared	0.0885	0.0845
Observations	6,482	6,482

Notes: Standard errors are in parentheses and clustered at the state level. Controls are the same as used in Table 2. *** p<0.01, ** p<0.05, * p<0.1

Table A2: Differential Impact of inheritance law reforms on Education Gap by Household and Social Characteristics

Y: *Education gap [S edu- B edu]*	Xi			
	× Mother education (above primary)	× Father education (above primary)	× Durables (Above median)	× SC/ST
	(1)	(2)	(3)	(4)
Age ≤ 10 at reform × Owns land × Xi	**1.256****	0.499	**0.927***	0.215
	(0.443)	(0.806)	(0.450)	(0.852)
Age 11–15 at reform × Owns land ×Xi	-0.638	-0.232	0.523	-0.775
	(0.814)	(0.746)	(0.452)	(1.024)
Age 16–20 a treform × Owns land × Xi	-0.005	-0.601	1.192	0.063
	(0.299)	(0.781)	(1.054)	(0.748)
Owns land	-0.917**	-0.628*	-0.714*	-1.004***
	(0.337)	(0.304)	(0.374)	(0.319)
Xi variable	0.730***	-0.010	0.425*	-0.355**
	(0.183)	(0.305)	(0.227)	(0.139)
Controls	No	No	Yes	Yes
Constant	Yes	Yes	Yes	Yes
NFHS Rounds	No	No	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
State Linear trends	Yes	Yes	Yes	Yes
Adj R-squared	0.186	0.185	0.184	0.184
Observations	6,541	6,539	6,549	6,549

Notes: Standard errors are in parentheses and clustered at the state level. Controls are the same as used in Table 2. Except for Mother's education and Father's education, we have used average parental education as control.
*** p<0.01, ** p<0.05, * p<0.1. All pairwise interactions are included but not shown.

Conceptual framework

Model of Inheritance and Human Capital Investment with Indivisible Land and Non-Zero-Sum Investment

Setup: For simplicity, we assume that parents have one daughter (d) and one son (s). Physical capital is in the form of land, and we assume it to be an indivisible unit normalized to 1 [L=1]. The reason for this is normally daughters marry out and give the part of land, which might be the source of livelihood, or land on which the ancestral home is not feasible. Due to indivisibility and social norms, land is fully transferred to the son [P_s=1, P_d=0]. Parents choose human capital investments: $H_s \geq 0$, $H_d \geq 0$. Total human capital investment budget: $H_s + H_d \leq Y$, where, Y is the total resources allocated to human capital, which can vary before and after reform.

Parents want to maximize weighted sum of children's utilities, their utility function is given by:

$$U = \alpha\, U_s(P_s,H_s) + (1- \alpha U_d(P_d,H_d)$$

with $0<\alpha<1$ capturing parental preference/bias, it could be neutral (α=0.5) or biased towards son.

Assume child utility is linear in transfers minus convex cost of human capital investment:

$$U_i(P_i, H_i) = \beta P_i + \gamma H_i - \frac{c}{2} H_i^2, \qquad i \in \{s, d\}$$

Where, $\beta>0$ is the utility from land ownership, $\gamma>0$ is marginal utility from human capital,

$c>0$ controls convexity of cost for investment in education.

Subjected to: $P_s + P_d = 1$, $P_i \in \{0,1\}$ & $H_s + H_d \leq Y$

with social norms enforcing pre- and post-reform land assignment: P_s=1, P_d=0

Pre-Reform Scenario:

Fixed human capital budget Y^{pre}, with parents maximizing:

$$\max_{H_s, H_d \geq 0} \alpha(\beta + \gamma H_s - \frac{c}{2} H_s^2) + (1 - \alpha)(\gamma H_d - \frac{c}{2} H_d^2)$$

subject to: $H_s + H_d \leq Y^{pre}$

Using Lagrangian:

$$\mathcal{L} = \alpha\left(\beta + \gamma H_s - \frac{c}{2}H_s^2\right) + (1-\alpha)\left(\gamma H_d - \frac{c}{2}H_d^2\right) - \lambda(H_s + H_d - Y^{pre})$$

First-Order Conditions (FOCs):

$$\frac{d\mathcal{L}}{dH_s} = \alpha(\gamma - cH_s) - \lambda = 0 \; ; \frac{d\mathcal{L}}{dH_d} = (1-\alpha)(\gamma - cH_d) - \lambda = 0 \; ; \frac{d\mathcal{L}}{d\lambda} = Y^{pre} - H_s - H_d = 0$$

Solving for FOCs we get:

$$H_s = \frac{1}{c}[\gamma(2\alpha - 1) + cY^{pre}(1-\alpha)]$$

$$H_d = \frac{1}{c}[\gamma(1 - 2\alpha) + cY^{pre}(\alpha)]$$

Pre-Reform Gender Gap in Human Capital:

$$\Delta^{pre} = {H_s}^{pre} - {H_d}^{pre} = \frac{1}{c}[\gamma(2\alpha - 1) + cY^{pre}(1-\alpha)] - \frac{1}{c}[\gamma(1 - 2\alpha) + cY^{pre}(\alpha)]$$

$$= \frac{4\alpha - 2}{c}\gamma + Y^{pre}(1 - 2\alpha)$$

If α>0.5, parental preference favors son → 4α−2>0, then Gender gap is positive: son receives more education.

Post-Reform Scenario:

Assuming that total human capital budget expands :$Y^{pre} < Y^{post}$ (non-zero sum investment)

Possibly shifting parental preferences towards more equality i.e., $\alpha^{post} \rightarrow 0.5$ or reduced bias.

Re-applying above formula with Y^{post} & α^{post}:

$$\Delta^{post} = \frac{4\,\alpha^{post} - 2}{c}\gamma + Y^{post}(1 - 2\,\alpha^{post})$$

Conditions for Gender Gap to Narrow: iff $\Delta^{post} < \Delta^{pre}$

which depends on: $Y^{pre} < Y^{post}$ (larger investment budget), $\alpha^{post} < \alpha^{pre}$ (less parental bias) or both reduce Δ. Land indivisibility and norms dictate that sons inherit land. Parents respond by increasing total investment Y*Y*, especially in daughters' education. Reduced bias α towards sons' investments post-reform promotes equity. Non-zero sum investments (increase in *Y*) mean daughters catch up without reductions in sons' investments.