Does Inheritance Law Reform Improve Women's Access to Capital? Evidence from Urban India *

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Abstract

This paper explores the impacts of the amendment to the 1956 Hindu Succession Act on Hindu females' intergenerational transfers of physical and human capital. Information on the timing of three generations' key life events helps isolate the causal effects. Our primary estimation strategy is a difference-in-difference estimator in which we compare the share of total assets received by male and female siblings in the same household between households whose heads died before and after the amendment. In the case of human capital investment, we compare primary education attainment of young cohorts who were potentially benefit from the reform and the older cohorts who were unlikely to benefit from the reform. In light of the fact that the amendment applies only to Hindus but not to Muslims, we compare the results between Hindus and Muslims for a robustness check. The results suggest that the amendment increased the share of total physical assets received by Hindu females who were single before the reform by 0.216. They also point towards an increase in the share of gifts transferred to Hindu females by 0.147. Hindu girls gained 0.594 years of more primary education than boys relative to the old cohort after the amendment.

Keywords: Gender, India, Inheritance Law, Intergenerational Transfers

1. Introduction

Women's empowerment and gender equality not only matter for their own sake, as presented in Millennium Development Goals 3 and 5, but also contribute enormously to economic development, political choices and welfare of the future generation, as documented by a growing body of research (Chattopadhyay and Duflo 2004; Qian 2008; Udry 1996). Despite steadily closing gender gaps witnessed in developing countries in past decades[1], gender disparities persist in mortality, political representation, earnings, asset ownership, and other areas. For instance, between 1990 and 2008, only 90 out of 147 countries which had a decrease in maternal mortality rate showed a decline of 40% or more, and 23 countries actually experienced an increase (WHO, UNIFEC, UNFPA, and World Bank 2010). In the same period (1995-2009), the share of women parliamentarians increased only from 10% to 17% (World Bank 2011). In large parts of Africa and South Asia, women possess only temporary rights to land and are more likely to become victims of land conflict (Deininger and Castagnini 2006; Goldstein and Udry 2008).

Widespread gender disparity also exists in intergenerational transfers of physical and human capital explicitly controlled by parents. Daughters are found to receive less education, land, and total inheritance in the Philippines (Quisumbing 1994) and in Ghana (Quisumbing *et al*. 2004). The World Bank's 2012 development report (World Bank 2012) shows that while remarkable progress has been achieved in education for most countries, the gender gap remains severe for the poorest segments of the population. For example, despite similar rates of participation in school for boys and girls from the top income quintile (fifth) in India, girls lag behind boys by almost five years in the bottom income quintile. This disparity in education could generate and widen gender gaps in other domains, as material wealth and human capital investments are determinants of the ease with which children can accumulate individual capital (Blinder 1973; Becker and Tomes 1979; Kotlikoff and Summers, 1981; Sheshinski and Weiss, 1982), which plays an important role in the development of endowments, the distribution of earnings and wealth, the status in the marriage market, bargaining power within the household, and the quantity as well as the quality of the next generation. (Thomas 1990; Behrman *et al*. 1994; Brien and Lillard 1994; Zhang and Chan 1999).

Legal measures could provide a potential to reduce or eradicate accumulative gender discrimination created by the interactions of social norms and cultural customs, although sometimes they surrender to the

[1] According to World Bank (2011) female life expectancy increased dramatically in developing countries (by 20 to 25 years in most regions in the past 50 years) to reach 71 years globally in 2007 (compared with 67 for men), and women now outlive men in every region of the world. Two-thirds of all countries have reached gender parity in primary education enrollments, while in over one-third, girls significantly outnumber boys in secondary education. Between 1980 and 2008, the gender gap in participation narrowed from 32 percentage points to 26 percentage points. By 2008, women represented more than 40 percent of the global labor force.

traditional complex and restrict women's inheritance rights[2]. In Western Ghana, the 1985 Intestate Succession Law allows wives to legally own the land granted by husbands as gifts after wives help husbands establish cocoa farms (Quisumbing *et al*. 2001). In South Africa, the Communal Property Association Act was passed in 1996 to allow individuals to acquire land through membership in a communal property association (World Bank 2001). In India, the amendment to the Hindu Succession Act 1956 which acknowledges coparcenary ownership of daughters came into force nationally in 2005, following similar changes in some southern states one or two decades earlier. However, empirical literature of legal changes in inheritance rights is rare. To our knowledge, only Roy (2008) and Deininger *et al*. (2010) quantitatively assess the impact of inheritance law in the context of India.

In this study, we use a large household survey data collected in 2011 from 7894 urban Hindu and Muslim households to analyze the impact of the amendment of the Hindu Succession Act in the urban context. The survey contains detailed information on the timing of key life events, such as birth, death and marriage, and the level of education as well as assets received from parents by male and female individuals. We estimate the impact of the Hindu Succession Act amendment by taking advantage of the variation in the timing of death for the parents of household heads and their spouses, the timing of marriage for household heads, their spouses and the siblings of household heads and spouses, and the timing of decisions on primary education for the children of household heads and their spouses. Specifically, our estimation strategy is difference-in-difference in which we compare the share of total assets received by Hindu males and females whose parents died before and after the amendment of the act, the share of gifts received by Hindu males and females who married before and after the amendment of the act, and primary education years gained by Hindu boys and girls whose education decisions were made before and after the amendment of the act, after household fixed effects are controlled for. We rely on one more difference between Hindus and Muslims for a robustness check, given that the amendment of the act applies to Hindus but not Muslims. Our results suggest that the HSAA increased the share of total assets received by Hindu females who were single before the amendment by 0.216. While these females received more joint family property, their separate property received from fathers decreased in the long run. Our results also point towards an increase of 0.147 in the share of gifts from parents received by Hindu females who married after the amendment. In the meanwhile, Hindu girls who were in primary school and who were going to enroll in primary schools after the amendment gained 0.594 years of more primary education than boys in the same cohort relative to their older siblings who completed primary education before the amendment. The amendment of the act materialized gender equality for

[2] According to World Bank (2001) some customary laws give sons the exclusive right to inherit, while wives and unmarried daughters have the right to be maintained, and married daughters have no claim on their deceased father's property. Islamic law grants widows with children an eighth of property upon their husband's death, while childless widows receive a fourth. Daughters are entitled to half the amount their brothers inherit. Hindu law gives widows the right only to maintenance.

those who were single before the reform in terms of physical asset transfers, but failed to fully eradicate the dowry system.

The paper contributes to the literature in two ways. First, while an extensive literature concerns inequality caused by intergenerational transfers, few focus on inequality between males and females, leaving gaps to be filled. Davies (1982) shows a high income elasticity of bequests and attributes inherited wealth as a major cause of wealth inequality. De Nardi (2004) finds that voluntary bequests explain the emergence of large estates, and the introduction of a bequest motive generates lifetime savings. Second, it is widely acknowledged that access to resources and opportunities could empower females in private and public spheres, and thereby lead to desirable social and economic outcomes. Hoddinott and Haddad (1995) show that raising wives' share of cash income increases the budget share of food, and reduces the budget shares of alcohol and cigarettes. Stevenson and Wolfers (2006) find declines in females committing suicide and murdered by their partners following the introduction of unilateral divorce. Equal inheritance rights granted to females might also bring about favorable outcomes.

The paper is organized as follows: Section 2 provides context by reviewing India's Hindu Succession Act and its amendment. Section 3 discusses the data used and the sample constructed, reports descriptive statistics on physical capital transfers and human capital investments and introduces the estimation strategy. Section 4 presents econometric results to quantify the impacts of the institutional change on total assets received from parents, gifts received from parents, and educational attainment. Section 5 concludes by drawing out implications for policy and possible future research.

2. Background

The Hindu Succession Act 1956 (HAS) governed property rights of Hindus nationally[3], unifying two main schools of Hindu law that prevailed since the twelfth century AD – *Mitakshara* and *Dayabhaga*[4], before state governments enacted legislation to amend it between 1986 and 2005. The *Mitakshara* system classifies property as separate property and joint family property, while the *Dayabhaga* system identifies all property as separate property.[5] The 1956 HSA granted Hindu daughters equal shares of deceased

[3] The Hindu Succession Act applies to Hindus, Buddhists, Jains and Sikhs but not Muslims, Christians, Parsis and Jews.
[4] *Dayabhaga* governed Bengal and Assam while *Mitakshara* dominated in the rest of the country (Agarwal 1994).
[5] According to Roy (2008) the most important distinction between these two schools was in terms of their classification of property. The *Mitakshara* system made a distinction between 'joint family property' and 'separate property'. Joint family property 'consisted principally of ancestral property (that is, property inherited from the father, paternal grandfather or paternal great-grandfather), plus any property that was jointly acquired or was acquired separately but merged into the joint property' while separate property 'included that which was self-acquired (if acquired without detriment to the ancestral estate) and any property inherited from persons other than his father, paternal grandfather or paternal great-grandfather' (Agarwal 1994). Under *Mitakshara*, four generations of male members became joint heirs or coparceners to the joint family property by birth while women had no such rights. The *Dayabhaga* system, on the other hand, treated all property as self-acquired/separate property including the person's 'notional' share of joint family property.

Hindus' separate property as sons and spouses if the Hindus died without making wills,[6] but excluded daughters and widows as coparceners for joint family property. On the contrary, sons not only enjoyed the right to inherit parents' separate property, but also could receive joint family property, shared only among the fathers plus his male linear descendants, and demand its partition.[7] Therefore, while daughters in *Dayabhaga* could possibly receive the same share of property from fathers dying intestate as sons, they absolutely received a smaller share in *Mitakshara* as compared to their brothers. The 1956 HAS seeking gender equality in inheritance failed to do so as *Mitakshara* dominates most of India's states.

Amendments to the 1956 HSA were proposed by some states in the last twenty years of twentieth century (Andhra Pradesh in 1986, Maharashtra in 1989, and Karnataka and Tamil Nadu in 1994)[8], and expanded to cover the entire nation in 2005, triggered by not only the awareness that the exclusion of daughters from participating in coparcenary ownership because of sex was ethically unjust, but also the persistent inflation of dowry and associated violent behaviors. These amendments are essentially identical across states, giving daughters who married after the reform equal rights to inherit joint family property with sons. The change introduced by the Hindu Succession Act Amendment (HSAA) provides us a natural experiment to explore whether or not the legislation empowered women in intergenerational transfers of physical and human capital.

Empirical studies are involved in assessing the eventual impact in four respects. First, several legal measures for eliminating evil social practices such as dowry or caste discrimination turned out to be fruitless in practice (Anderson 2003), casting doubt on the effectiveness of the HSAA. Second, the direction of effects among physical capital transfers (joint family property, separate property and dowry) is unknown. Regarding separate property, parents might either will separate property away from daughters to maintain the existing allocation, as proposed by the preference model (Behrman, Pollak, and Taubman 1982), or follow the amendment's spirit to divide separate property equally among children. Regarding dowry, on the one hand, parents might reduce daughters' dowry who married after 1994 because they realized daughters would inherit more joint family property after the father was deceased, which is consistent with preferences for inter-sibling equality (Behrman, Pollak, and Taubman 1982). On the other hand, even potential inheritance might increase women's intrahousehold bargaining power and make women more dependable for their parents, which could stimulate parents to transfer more to daughters before death, consistent with the model of exchange-motivated bequests (Bernheim, Schleifer, and Summers 1986). In addition, from the demand side, husbands' families may demand more gifts from

[6] All Hindu individuals are entitled to will their separate property to a desired beneficiary.
[7] The deceased father's notional share of joint property was allocated among all male and female heirs, normally in equal shares.
[8] Kerala abolished joint family property system and granted all family members their separate share in 1976 (Agarwal 1994). The spirit of the amendment is the same as those in other states, in favor of the inheritance of daughters.

their wives' parents to take advantage of the improved economic condition and social status of their wives (relative to their wives' male siblings). Third, human capital could either substitute or complement physical capital. Parents could increase human capital investment in sons and reduce that in daughters under a household budget constraint, or vice versa. Fourth, whether or not equal property rights translated into females' greater bargaining power within households needs to be empirically examined.

Some recent studies provide partial empirical evidence for these arguments. In a 2005-06 representative sample (the National Family Health Survey), Hindu females who married after the HSAA came into force are found to enjoy more autonomy within their households, measured by three self-reported indicators of independent travels. The estimated effect is stronger for females whose husbands own land and engage in farming as land is the most frequent form of joint family property (Roy 2008). Using the 2006 wave of the Rural Economic and Demographic Survey, Deininger *et al*. (2010) compare within household bequests of land given to sons and daughters by exploiting the variation in the timing of father's death, and find that daughters are more likely to inherit land in Hindu families. Their results also point towards an increase in age at marriage and in educational attainment of Hindu girls. While these studies cover rural areas and focus on inheritance of land which constitutes the main asset and source of livelihood in rural India, our sample from urban India allows us to explore asset transfers beyond joint family property. We compare (i) the share of total assets received by females and males in the same parental household whose parents passed away before and after the HSAA came into force; (ii) the share of gifts received by females and males in the same parental household who married before and after the HSAA took into effect; and (iii) educational attainment of girls and boys in difference cohorts in the same parental household for whom decisions on primary education were made before and after the implementation of the HSAA.

3. Data and descriptive statistics

3.1 Sample composition and construction

Our data are from the 2011 Urban Property Ownership Records (UPOR) survey conducted in Karnataka's four cities: Davagere, Gulbarga, Mysore and Shimoga. The Household survey collected detailed information on three generations of people: household heads, their spouses and the siblings of household heads and spouses (generation II), the parents of household heads and their spouses (generation I), and the children of household heads, their spouses and the siblings of household heads and spouses (generation III). We observe basic characteristics of generation II individuals (i.e., age, education and the year of marriage, as well as assets received from their parents), the timing of their parent's deaths, and the educational outcomes of their children. While we focus on a sample of 7894 households with 29660

generation II individuals to explore the effects of the HSAA on physical capital transfers, we rely on a sample of 3112 households with 7948 generation III individuals to assess the effects of the HSAA on human capital investments. In our sample, 6473 Hindu households with 23779 generation II individuals and 2557 Hindu households with 6122 generation III individuals will be the sample for our main analysis. A sample of 5881 generation II individuals from 1421 Muslim families and 1826 generation III individuals from 555 Muslim families are used in the placebo analysis.

As an approximation of an ideal experiment, the Muslim sample is weighted to be most similar to the Hindu sample in terms of observed characteristics within the same city. Instead of claiming that the Hindu sample and the Muslim sample are identical after weighting, we assume the relevant differences between the two samples are captured by observed characteristics, and the religion factor only influences generation II's asset transfers and generation III's educational attainment through the HSAA. Appendix table 1 illustrates the significance of these attributes' differences between Hindus and Muslims with and without weights. As expected, weighting indeed improves the comparability between Hindu and Muslin population. First of all, weighting significantly decreased the magnitude of difference between the Hindu and the Muslim samples for some of the attributes. Moreover, weighting also reduced the number of attributes that differ significantly between the Hindu and Muslim individuals (from 17 to 12 for generation II, and from 5 to 4 for generation III).

Typical generation II individuals were born in the 1960s and attained between six and eight years education. They were originally from five children households, formed new families before 1994 and gave birth to two children. In addition to some 40% non-income individuals (92% of them are females), they almost equally distributed in three categories of monthly income – less than 5000 rupees, between 5000 and 9000 rupees, and more than 9000 rupees. Typical generation III individuals were born in the 1980s. They were from families having three children, and most of them (about 60%) were single in 2011. While half of generation III individuals did not earn income (93% of them are domestic workers and students), 10% earned less than 5000 rupees per month, 20% earned between 5000 and 9000 rupees per month, and 15% earned more than 9000 rupees.

We divide generation II individuals into sub-populations by whether or not one's parents are still alive and in the case they are not, whether or not they died before 1994. 22% of Hindu males have living fathers, 43% lost fathers before 1994, and 35% lost fathers after 1994. The situation differs only slightly for Hindu females as 25% of them have living fathers, 40% lost fathers before 1994, and 35% lost fathers after 1994. The situation is also comparable to the Muslim population with the corresponding percentages 25%, 38% and 37% for Muslim males and 27%, 36% and 37% for Muslim females. In the meantime, our

data show that almost half of the generation I females are still alive: in Hindu families, 44% of males' and 48% of females' mothers are still alive, while 25% of males and 23% of females (or 31% of males and 29% of females) lost mothers before (or after) 1994. The generation II Muslim sample presents a consistent composition, with the corresponding percentages 51%, 20% and 29% for males and 52%, 19% and 29% for females.

3.2 Descriptive statistics

Panel A of table 1 presents descriptive statistics on assets received from parents by generation II Hindu individuals by whether or not one's father is still alive, and in the case he is not, whether he died before or after 1994. Our data shows that Hindu females typically inherited smaller shares of assets than their male siblings when their fathers died. Although, probably mainly driven by dowry, females received 6% more assets from parents than men before fathers' death, males were compensated after fathers' death by inheriting more assets, resulting in 5% more assets for males whose fathers died before 1994, and 3% more assets for males whose fathers died after the implementation of the amendment. It is unlikely that evidence is due to the household's demographic structure, suggested by a parallel trend of the share variable conditional on the number of households' generation II members. While the descriptive statistics for Muslim individuals show an overall similar pattern (panel B of table 1), there are two differences. First, assets received by Muslim males after the death of their fathers were not large enough to outweigh the total assets received by their female siblings from their parents. Second, while Hindu females' share of assets increased from 0.87 to 0.92 conditional on household demographics after the amendment took into effect, Muslim females' corresponding share decreased from 0.98 to 0.94. However, a more conclusive result should be derived from an econometric analysis which controls for multiple sources of heterogeneity. Panel C of table 1 shows the assets received by generation II Hindu individuals from parents by whether or not one's mother is still alive and if she is not, by whether she died before or after 1994. We find an opposite pattern as compared to results in panel A – conditional on household demographics mothers transferred more assets to sons (from 1.08 to 1.13) and fewer assets to daughters (from 0.86 to 0.80) after the HSAA came into force. A similar pattern of asset transfers related to the timing of mother's death is also observed in the Muslim sample (Panel D). Again, the exact interpretation is not possible without controlling for other determinants.

Table 2 reports the level of education for the oldest generation III individuals born in 1970 (24 years old in 1994), and the youngest ones born in 1996 (15 years old in 2011, the year when the survey was conducted). We focus on this age range for two reasons. First, we intend to assess the HSAA's impact on primary education decisions. Normally primary schools in India enroll 6-14 years old children, which

implies every generation III individual in our sample was old enough to complete primary education in 2011. Second, we aim to distinguish two treatment groups, which are constructed based on the potential time length that the HSAA could influence an individual's primary education. The two treatment groups include, individuals less than 5 years old in 1994, and those 6-14 years old in 1994. For the former, the entire primary education could be affected by the HSAA, while for the latter, only part of the primary education years were exposed to the HSAA. By comparison, the control group comprises those between 15 and 24 years in 1994 and whose primary education would have been completed before the passage of the HSAA. Our data show that the share of Hindu girls who completed primary education is considerably higher for the two treatment groups (80% and 83%) than for the control group (71%). In the meantime, educational attainment of Hindu boys in the two treatment groups decreased slightly from 83% to 80% and 81%. While our data show a high share of Muslim individuals in the young cohorts completed primary or higher education than older cohorts (panel B), the largest improvement is observed with the youngest girls (34% as compared to 9% for the youngest boys). This could threaten our identification by suggesting some female-favored educational programs after 1994. However, while the descriptive analysis is informative, it does not allow us to interpret the casual relationship between HSAA and the outcome variables. We will rely on econometrics analysis to identify the causal relationships, which we focus in the next section.

3.3 Estimation strategy

While we hypothesize that the HSAA is likely to increase assets inherited by females after the death of their fathers, how the reform affected total assets received by females from their parents depends on (i) how it affected inheritance received and (ii) how it affected gifts (mainly dowry). We examine the two effects separately in our econometric analysis. Our estimation strategy is to compare the share of assets received by males and females in the same household before and after the HSAA came into force. Specifically, we define the two equations as below:

$$S_{ij} = \alpha_j + \beta_1 F_{ij} + \beta_2 F_{ij} * D_j + \beta_3 M_{ij} * F_{ij} * D_j + \beta_4 M_{ij} * F_{ij} + \beta_5 M_{ij} * D_j + \beta_6 M_{ij} + T_{ij} + \epsilon_{ij} \quad (1)$$

$$S_{ij}^{g} = \alpha_j + \gamma_1 F_{ij} + \gamma_2 F_{ij} * M_{ij} + \gamma_3 M_{ij} + T_{ij} + \epsilon_{ij} \quad (2)$$

where S_{ij} is the share of total assets of individual i in household j received as gifts and inheritance from parents, normalized by the number of generation II household members.[9] S_{ij}^{g} in equations (2) only

[9] $S_{ij} = \frac{A_{ij}}{A_{ij}+\sum_{n=1}^{N} A_{nj}} / \frac{1}{N+1}$. Let A_{ij} indicate total assets received from parents by individual i in household j, and N denote the number of individual i's siblings. A_{nj} is total assets received from parents by sibling n, and $\sum_{n=1}^{N} A_{nj}$ is the sum of all assets received from parents by the N siblings.

includes assets received as gifts, as here we concentrate on individuals whose fathers and mothers are alive. α_j is household fixed effects controlling for time-invariant household characteristics, F_{ij}, D_{ij}, and M_{ij} are indicator variables for female, whether or not the father/mother died after 1994, and whether or not the individual was single before 1994, and T_{ij} is a vector of birth year dummies controlling for time-variant aggregate effects. β_2 and β_3 in equation (1) and γ_2 in equation (2) are key parameters of interest capturing the impacts of the amendment on females' total assets received after fathers'/mothers' death and on females' assets received as gifts when fathers and mothers are alive. To assure that our estimation identifies the HSAA's impacts rather than captures the long-run trends, we also augment the model by including a vector of dummy variables for the robustness check. These variables include a set of dummies for the year when the father/mother died, in place of the indicator variable D_{ij} in equations (1). By the same token, we also add a vector of indicator variables for the year when the individual's marriage occurred, in place of the indicator variable M_{ij} in equations (2).

To assess the impact of the HSAA on generation III individuals' educational attainment, we estimate the following equation:

$$E_{ij} = \alpha_j + \beta_1 F_{ij} + \beta_2 F_{ij} * G_{ij} + \beta_3 G_{ij} + \epsilon_{ij} \quad (3)$$

where E_{ij} is the education attainment (years) of individual i in household j, truncated at the highest grade of primary education, grade nine. α_j and F_{ij} are defined similarly as in equations (1) and (2). G_{ij} is a vector of indicator variables, including whether or not the individual was born between 1980 and 1988 whose primary education decisions were supposed to be partially affected by the HSAA, and whether or not the individual was born between 1989 and 1996 whose primary education decisions were supposed to be fully affected by the HSAA. β_2 are the coefficients of interest, measuring the impact of the amendment on educational attainment of Hindu girls relative to boys. To assure that our estimation identifies the HSAA's impacts rather than captures the long-run trends, a complete set of impacts varying by birth years since 1977 is captured by G_{ij} in the robustness check.

4. Econometric results

The HSAA enforces joint family property to be divided equally among children after the father's death, but allows parents to allocate separate property as they wish. Past field studies indicate that more than 65% of Indian people die every year without wills (Agarwal 1994), suggesting that enormous separate property is likely to be distributed evenly among children after one parent passes away. This could have changed after the implementation of the HSAA. It is possible that generation I individuals began to will separate

property by taking into account the legal requirement on how the joint family property should be allocated. Since the survey did not collect information on joint family property and separate property separately, it is impossible to directly trace fathers' wills on how separate property is allocated because joint family property is typically allocated upon the death of fathers. However, it is possible to directly trace mothers' wills on how separate property is allocated, because mothers' death only influences the allocation of separate property but not joint family property. If the wills made by mothers who died after 1994 deviate from those made by mothers who died before 1994, we would detect a change in total asset transfers due to a change in the allocation of mothers' separate property.

4.1 Total assets received if the father died

The first two columns of table 3 show the results of equation (1) for generation II Hindu individuals whose fathers passed away. In addition to the result for the base specification (column 1), the results for the augmented specifications are reported in column 2 (to control for the individual's marriage time effects). Placebo tests using the Muslim sample are reported in columns 3-6. To make the analysis based on the Muslim sample comparable to that based on the Hindu sample, we weight the Muslim sample using the propensity score. However, one caveat is that Muslims cannot be an ideal group for the placebo analysis, since there is a long history of different cultures and social norms between the two groups. In the assumption that Hindus and Muslims have common trends, the placebo analysis should be less biased than the analysis based on the Hindu sample, but the small size of the Muslim sample is likely to lead to a higher variance.

We find from the base specification (column 1) that, the share of assets received by Hindu females from parents was 0.301 lower than that received by males, and the share of assets received by Hindu females whose father died after the amendment took into effect was 0.123 higher than that received by Hindu females whose father died before 1994 relative to their male siblings. To check whether or not the results vary by the individual's marriage time, we add to the base specification the interaction terms of the father's death year and whether one was single before 1994 (column 2). Consistent with the legal provisions, the HSAA mainly made Hindu females who were single before 1994 better off and materialized equality with their male siblings. In contrast, we find the coefficients on the same variables are not only statistically insignificant, but also have much smaller magnitude for the Muslim sample (columns 3 and 4), strengthening the point that our estimation of the impact of the HSAA is indeed caused by the reform itself.

Figure 1 plots the trends for Hindu females who were married and single before the amendment, respectively (from the augment specification controlling for time-variant effects). A few interesting

observations emerge from the graphical presentation. First of all, we find a sharp increase in assets transferred to Hindu daughters who were single before the amendment appears in the year when the amendment came into force, and the trend thereafter persists to fluctuate above zero. On the contrary, the pre- and post- amendment coefficients on Hindu daughters who married before the amendment fluctuate around zero. Second, the magnitude of the impact on Hindu daughters who were single before the amendment tends to decline after it peaks in the first year after the passage of the HSAA, suggesting that fathers willed separate property away from daughters who are expected to benefit from the passage of the HSAA. This is consistent with the model of preferences for inter-sibling equality (Behrman, Pollak, and Taubman 1982).

4.2 Total assets received if the mother died

Table 4 presents the results in the same way as table 3. Results for the base specification (column 1) show that, the share of assets received by Hindu females whose mother died after the amendment came into force was 0.103 lower than that received by Hindu females whose mother died before 1994 as compared to their male siblings. The combination of the significant coefficient on the interaction between the female dummy and the dummy variable for whether or not her mother died after 1994, and the insignificant coefficient on the three-term interaction (between female dummy, the dummy variable for whether or not she was single before 1994 and the dummy variable for whether or not her mother died after 1994) in column 2 suggests that, the death of mother after 1994 only made daughters who married before 1994 worse off, but not those who were single before 1994. This is further supported by the graphical results in figure 2 where time-variant effects are controlled for. While the trend for Hindu females who were single before the reform fluctuates around zero throughout the years, the trend for Hindu females who were married before the reform fluctuates below zero if their mothers passed away after the amendment came into force. However, the Muslim sample shows a similar pattern (columns 3 and 4), suggesting that we cannot attribute the asset allocation behaviors of Hindu mothers to the HSAA.

4.3 Assets received as gifts if the father and the mother are alive

We are also interested in estimating the effects of the HSAA on assets received as gifts. There are two reasons why this is important. First of all, eradicating the evils of dowry system is another objective for amending the 1956 HSA. Second, to understand how the HSAA affects transfers through other channels is an interesting issue in its own rights. To explore this issue, we have to rely on a subsample that is composed of generation II married individuals whose fathers and mothers were both alive at the time of survey so the assets they received from parents are likely to be gifts.

The first column of table 5 shows the results of equation (2) for generation II Hindu individuals. Placebo tests using the Muslim sample are reported in column 2 and 3. The results (column 1) suggest that Hindu females received as many gifts as their brothers even if they married before 1994, probably because of the practice of dowry. The results also points towards an increase in the share of gifts received by Hindu females who were single before 1994 as compared to their sisters who married before 1994 and their brothers who were single before 1994 by 0.144 and 0.167, respectively, among which 0.147 was brought about by the HSAA exclusively. The much smaller coefficients on the corresponding variables for the Muslim sample (column 2) again lend support to the validity of our identification strategy. Since we find in section 4.1 that fathers willed separate property away from daughters who married in post-amendment periods, the increasing gifts received by Hindu females could be attributed to the demand of the husband's families rather than parents' voluntary behaviors in line with the model of exchange-motivated bequests (Bernheim, Schleifer, and Summers 1986).

Figure 3 plots estimated coefficients on the interaction between the female dummy and the indicator for the year of marriage based on the Hindu sample. We notice that, despite the generally declining trend with fluctuations over time, the gifts received by Hindu females married after the amendment is systematically higher than those married before the amendment, suggesting that the HSAA failed to achieve its objective of eradicating the dowry system.

4.5 Educational attainment

In spite of a clear increase in physical capital transfers to Hindu females after the HSAA came into force, how the HSAA affects the human capital of daughters relative to sons is less clear. On the one hand, it is possible that parents could rebalance the overall resource allocation by investing more in their sons' education than in their daughters' education to compensate for the fact that their daughters would inherit more after the implementation of HSAA (consistent with the hypothesis of Behrman, Pollak, and Taubman 1982). If this is the case, HSAA could widen the gender gap. On the other hand, as suggested by the efficiency hypothesis (Bernheim, Schleifer, and Summers 1986), parents are likely to increase investment in their daughters so they can take advantage of the future improved economic opportunities under the new inheritance law. Meanwhile, the improved bargaining power of wives relative to husbands under the new inheritance law could alter household's education decisions to shift in favor of girls. We focus on generation III individuals to assess the HSAA's impact on human capital investments because their parents, generation II individuals, were not young enough for their primary education decisions to be affected by the amendment.

The education regression results are presented in table 6. The significant and negative coefficients on the female dummy in the base specification (column 1) show that girls attained less primary education than boys in the Hindu sample (0.860 years less) before the reform. For those whose education decisions were made after the reform, they had 0.594 more years of primary schooling than their older cohort, but their level of education continues to be lower than that of the boys in the same cohort. Results in column 2 suggests that the HSAA led to quantitatively large educational improvements for both young cohorts (0.477 years for those partially exposed to the reform and 0.701 years for those full exposed to the reform) as compared to their sisters in the older cohort. The rejection of equal coefficients between the fully exposed cohort and the partially exposed cohort further support the hypothesis that the effect of the HSAA on education increases with the time exposure to the reform. Figure 4 compares the educational attainment of those who were born after 1976 with those in the base group[10] (those born between 1970 and 1976). The graphical results build up what we find in table 6. A caveat is due when interpreting these results, as we find a similar trend with bigger magnitudes based on the Muslim sample (columns 4 and 5 of table 6). However, these results provide some evidence on the impact of the HSAA on educational attainment, given the lack of additional control groups.

Favorable effects on generation III females' educational outcome could be delivered through two mechanisms. On the one hand, the human capital investment could complement physical capital transfers if parents changed their attitudes towards daughters. On the other hand, generation II females' growing intrahousehold bargaining could alter household decisions in favor of daughters. To explore directly which mechanism leads to our finding, we interact variables in column 1 with an indicator variable for whether or not the maternal grandfather died after 1994 (in column 3 of table 6).[11] The statistically insignificant coefficient on the interaction, together with the nearly unchanged coefficient on women born between 1980 and 1996 lend support to the first mechanism.

5. Conclusion

Interventions for correcting gender discrimination could work through channels of markets, formal institutions, and informal institutions where different policies may affect different groups in society. For formal institutions, changed laws in favor of females can redistribute resources and power between males and females. The rigorous evaluation turns to be crucial for recommendation and generalization of a particular policy. The Karnataka amendment to the inheritance law provides us a natural experiment to

[10] The youngest people in the baseline was 18 years old in 1994, who should be old enough even considering grade repetition and delayed school entry.

[11] The sample size shrinks by about 6%, because for generation III individuals whose mother already died at the survey time, we have no information on their maternal grandfathers' death status.

examine whether or not its objective has been achieved, and provide experiences for the entire nation as well as for other developing countries where females remain disadvantaged in inheritance rights.

A unique dataset containing comprehensive information on three generations of individuals allows us to explore the mechanism through which parents reallocate physical and human capital among children following the amendment in inheritance legislation. Regarding physical capital transfers, three results stand out. First, the HSAA increased the share of assets received by females who were single before the reform if their fathers passed away after the amendment. Second, fathers willed away separate property from daughters who were single before the reform in the long run. Third, females who married after the reform received a higher share of gifts. While the HSAA eliminated gender inequality for those who were single before the amendment, it failed to achieve the objective of eradicating the evils of dowry system. In the meanwhile, an increase in girls' educational attainment after the HSAA suggests that, although a substitution occurred between joint family property and separate property, the amendment has reinforced rather than undermined human capital investment on daughters, leading to improvement in women's future economic and social status.

As a determinant instead of a simple symptom of gender inequality, property rights affected by the HSAA and targeting the root cause of the problem could affect other strong biases against women out of our current study. Physical capital could enable women to access credit and other inputs, thus facilitating women to achieve the same productivity as men in agriculture and entrepreneurship. Human capital could allow women to break occupational segregation and to close the gender gap in labor income. Further research could identify indirect impacts of the HSAA on gender inequality in multiple domains through women's strengthened property rights. In addition, while Roy (2008) finds the positive effect of the HSAA on women's autonomy based on three subjective measures, this paper does not attribute girls' increasing educational attainment to mothers' growing bargaining power granted by the HSAA. This highlights the need to use objective measures of bargaining power including consumption composition, children's nutrition and health, and women's time allocation between labor market and household work in further research.

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Table 1: Received assets of generation II

	Total Sample	Father alive	Father died	
			Died before 1994	Died after 1994
Panel A: Hindu				
Men				
Total assets received from parents (rupees)	208676	111298	241231	230200
Share of assets received from parents among GII	0.28	0.23	0.30	0.27
Share of received assets*number of GII members	1.02	0.89	1.07	1.04
No. of observations	13136	2905	5681	4550
Women				
Total assets received from parents (rupees)	48660	43892	51780	48509
Share of assets received from parents among GII	0.26	0.29	0.25	0.24
Share of received assets*number of GII members	0.95	1.10	0.87	0.92
No. of observations	10643	2671	4261	3711
Panel B: Weighted Muslim				
Men				
Total assets received from parents (rupees)	144045	84623	151509	168691
Share of assets received from parents among GII	0.28	0.22	0.33	0.26
Share of received assets*number of GII members	0.97	0.89	0.99	0.99
No. of observations	3220	795	1234	1191
Women				
Total assets received from parents (rupees)	44496	39909	50076	40704
Share of assets received from parents among GII	0.29	0.29	0.30	0.26
Share of received assets*number of GII members	1.00	1.15	0.98	0.94
No. of observations	2661	727	953	981
	Total Sample	**Mother alive**	**Mother died**	
Panel C: Hindu			**Died before 1994**	**Died after 1994**
Men				
Total assets received from parents (rupees)	208676	117017	262760	297183
Share of assets received from parents among GII	0.28	0.24	0.33	0.29
Share of received assets*number of GII members	1.02	0.91	1.08	1.13
No. of observations	13136	5831	3256	4049
Women				
Total assets received from parents (rupees)	48660	43738	52951	53320
Share of assets received from parents among GII	0.26	0.28	0.26	0.21
Share of received assets*number of GII members	0.95	1.08	0.86	0.80
No. of observations	10643	5081	2463	3099
Panel D: Weighted Muslim				
Men				
Total assets received from parents (rupees)	144045	79752	203158	18291
Share of assets received from parents among GII	0.28	0.22	0.36	0.30
Share of received assets*number of GII members	0.97	0.89	0.99	1.05
No. of observations	3220	1628	648	944
Women				
Total assets received from parents (rupees)	44496	38595	58022	41066
Share of assets received from parents among GII	0.29	0.27	0.34	0.26
Share of received assets*number of GII members	1.00	1.09	0.98	0.90
No. of observations	2661	1379	501	781

Table 2: Educational attainment of generation III

	Total Sample	Father alive	Father died	Mother alive	Mother died
Panel A: Hindu					
Men					
Born 1970-1979: Standard years of schooling	12.05	12.38	11.04	12.16	11.01
Born 1970-1979: Primary education or below	0.17	0.15	0.20	0.16	0.24
Born 1980-1988: Standard years of schooling	11.99	12.30	10.56	12.01	11.68
Born 1980-1988: Primary education or below	0.20	0.16	0.34	0.20	0.20
Born 1989-1996: Standard years of schooling	11.28	11.50	9.38	11.28	11.34
Born 1989-1996: Primary education or below	0.19	0.16	0.42	0.19	0.19
No. of observations	3510	2916	594	3295	215
Women					
Born 1970-1979: Standard years of schooling	10.29	10.68	9.13	10.31	10.13
Born 1970-1979: Primary education or below	0.29	0.26	0.39	0.29	0.28
Born 1980-1988: Standard years of schooling	11.82	12.26	9.88	11.82	11.81
Born 1980-1988: Primary education or below	0.20	0.17	0.34	0.20	0.28
Born 1989-1996: Standard years of schooling	11.23	11.38	9.96	11.24	10.90
Born 1989-1996: Primary education or below	0.17	0.15	0.34	0.17	0.16
No. of observations	2612	2186	426	2452	160
Panel B: Weighted Muslim					
Men					
Born 1970-1979: Standard years of schooling	8.48	9.48	6.53	8.47	10.34
Born 1970-1979: Primary education or below	0.46	0.41	0.55	0.46	0.56
Born 1980-1988: Standard years of schooling	10.11	10.41	8.80	9.98	11.31
Born 1980-1988: Primary education or below	0.34	0.30	0.50	0.35	0.26
Born 1989-1996: Standard years of schooling	10.14	10.29	8.82	10.03	11.78
Born 1989-1996: Primary education or below	0.37	0.35	0.59	0.39	0.14
No. of observations	1037	875	162	1000	37
Women					
Born 1970-1979: Standard years of schooling	7.45	9.28	4.31	7.42	7.64
Born 1970-1979: Primary education or below	0.62	0.53	0.76	0.56	0.91
Born 1980-1988: Standard years of schooling	10.19	10.44	9.34	9.95	12.20
Born 1980-1988: Primary education or below	0.36	0.35	0.42	0.41	0.02
Born 1989-1996: Standard years of schooling	10.48	10.59	9.63	10.28	12.07
Born 1989-1996: Primary education or below	0.28	0.27	0.41	0.31	0.10
No. of observations	789	652	137	753	36

Table 3: Share of assets received from parents if fathers died (generation II)

	Hindu		Weighted Muslim		Difference	
	(1)	(2)	(3)	(4)	(5)	(6)
Female (β_1)	-0.301***	-0.330***	-0.069	-0.080	-0.232***	-0.244***
	(0.023)	(0.024)	(0.049)	(0.053)	(0.055)	(0.059)
Female*Father's death after 1994 (β_2)	0.123***	0.045	-0.002	-0.033	0.123	0.085
	(0.034)	(0.037)	(0.070)	(0.074)	(0.078)	(0.083)
Female*Father's death after 1994*Single before 1994 (β_3)		0.216**		0.103		0.121
		(0.086)		(0.165)		(0.188)
Female*Single before 1994 (β_4)		0.115*		0.060		0.018
		(0.067)		(0.134)		(0.149)
Father's death after 1994*Single before 1994 (β_5)		0.076		0.155		-0.098
		(0.059)		(0.128)		(0.140)
Single before 1994 (β_6)		-0.266***		-0.124		-0.082
		(0.048)		(0.102)		(0.108)
Observations	18,203	18,203	4,359	4,359	22,562	22,562
R-squared	0.099	0.106	0.160	0.164	0.116	0.122
F-Tests:						
$\beta_1+\beta_2 = 0$		100.92***				
$\beta_1+\beta_2+\beta_3+\beta_4= 0$		0.85				

Female is an indicator variable for whether the individual is female. Father's death after 1994 is an indicator variable for whether the father of the child died after the amendment of the act, i.e. after the year 1994. Single before 1994 is an indicator variable for whether the individual was single before the amendment of the act, i.e. before the year 1994.
The last two columns are based on regressions with the Hindu sample and the weighted Muslim sample.
All regressions include household fixed effects and birth year controls.
Robust standard errors to heterogeneity are in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 4: Share of assets received from parents if mothers died (generation II)

	Hindu		Weighted Muslim		Difference	
	(1)	(2)	(3)	(4)	(5)	(6)
Female (β_1)	-0.357***	-0.361***	-0.063	-0.070	-0.293***	-0.285***
	(0.032)	(0.032)	(0.074)	(0.073)	(0.081)	(0.080)
Female*Mother's death after 1994 (β_2)	-0.103**	-0.148***	-0.160*	-0.157*	0.061	0.020
	(0.042)	(0.044)	(0.090)	(0.091)	(0.099)	(0.101)
Female*Mother's death after 1994*Single before 1994 (β_3)		0.209		-0.004		0.206
		(0.136)		(0.334)		(0.367)
Female*Single before 1994 (β_4)		-0.005		0.072		-0.100
		(0.118)		(0.322)		(0.341)
Mother's death after 1994*Single before 1994 (β_5)		-0.076		0.117		-0.196
		(0.098)		(0.185)		(0.213)
Single before 1994 (β_6)		-0.138		-0.001		-0.038
		(0.092)		(0.178)		(0.185)
Observations	12,867	12,867	2,874	2,874	15,741	15,741
R-squared	0.133	0.136	0.189	0.191	0.146	0.148
F-test:						
$\beta_2 + \beta_3 = 0$		0.21				

Female is an indicator variable for whether the individual is female. Mother's death after 1994 is an indicator variable for whether the mother of the child died after the amendment of the act, i.e. after the year 1994. Single before 1994 is an indicator variable for whether the individual was single before the amendment of the act, i.e. before the year 1994.
The last two columns are based on regressions with the Hindu sample and the weighted Muslim sample.
All regressions include household fixed effects and birth year controls.
Robust standard errors to heterogeneity are in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5: Share of assets received from parents if fathers and mothers are alive (generation II)

	Hindu	Weighted Muslim	Difference
	(1)	(2)	(3)
Female (γ_1)	0.020	0.086	-0.082
	(0.045)	(0.086)	(0.086)
Female*Married after 1994 (γ_2)	0.147***	0.099	0.074
	(0.056)	(0.106)	(0.112)
Married after 1994 (γ_3)	-0.003	0.072	-0.061
	(0.058)	(0.115)	(0.101)
Observations	4,042	1,036	5,078
R-squared	0.412	0.479	0.438
F-tests:			
$\gamma_1+\gamma_2=0$	20.09***		
$\gamma_2+\gamma_3=0$	9.37***		

Female is an indicator variable for whether the individual is female. Married after 1994 is an indicator variable for whether the child got married after the amendment of the act, i.e. after the year 1994.
The two column is based on regressions with the Hindu sample and the weighted Muslim sample.
All regressions include household fixed effects and birth year controls.
Robust standard errors to heterogeneity are in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 6: Primary educational attainment (generation III)

	Hindu			Weighted Muslim			Difference		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Female (β_1)	-0.860***	-0.859***	-0.821***	-0.316	-0.321	-0.126	-0.544	-0.538	-0.695
	(0.158)	(0.158)	(0.206)	(0.471)	(0.473)	(0.438)	(0.527)	(0.528)	(0.510)
Female*Born between 1980-1996 (β_2)	0.594***		0.512**	0.809*		0.583	-0.216		-0.071
	(0.167)		(0.227)	(0.484)		(0.594)	(0.542)		(0.674)
Female*Born between 1980-1988 (β_{21})		0.477***			0.729			-0.252	
		(0.176)			(0.538)			(0.600)	
Female*Born between 1989-1996 (β_{22})		0.701***			0.860*			-0.158	
		(0.178)			(0.486)			(0.548)	
Born between 1980-1996 (β_3)	0.063		0.064	0.113		0.450	-0.050		-0.387
	(0.121)		(0.171)	(0.428)		(0.531)	(0.473)		(0.592)
Born between 1980-1988 (β_{31})		0.058			0.117			-0.059	
		(0.123)			(0.433)			(0.478)	
Born between 1989-1996 (β_{32})		0.294**			0.378			-0.085	
		(0.149)			(0.422)			(0.474)	
Female			0.158			-1.105			1.263
*Maternal grandfather's death after 1994 (β_4)			(0.320)			(1.592)			(1.733)
Female*Born between 1980-1996			-0.068			1.055			-1.124
*Maternal grandfather's death after 1994 (β_5)			(0.343)			(1.616)			(1.762)
Born between 1980-1996			0.098			-1.035			1.134
*Maternal grandfather's death after 1994 (β_6)			(0.239)			(0.868)			(0.958)
Observations	6,122	6,122	5,747	1,826	1,826	1,753	7,948	7,948	7,500
R-squared	0.657	0.660	0.651	0.797	0.798	0.800	0.762	0.764	0.766
F-tests:									
$\beta_1+\beta_2=0$	19.45***								
$\beta_2+\beta_3=0$	15.87***								
$\beta_{21}=\beta_{22}$		3.56*							

Female is an indicator variable for whether the individual is female. The baseline category includes children born between 1970-1979 (15-24 years old in 1994). Born between 1980-1988 includes children who were 6-14 years old in 1994. Born between 1989-1996 includes children who were 0-5 years old in 1994 and who were born in the next two years of 1994.

The youngest cohort (born in 1996) was 15 years old in the surveyed year, 2011. Since primary school ages in India are 6-14 years old, all children in the sample should have completed study in primary schools.

Maternal grandfather's death after 1994 is an indicator variable for whether or not children's maternal grandfather died after 1994.

Education years are truncated at grade nine to look at decisions on primary education.

All regressions household fixed effects.

Robust standard errors to heterogeneity are in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Figure 1: Coefficients on Female*Father's death year and Female*Father's death year*Single before 1994 for the share of assets received from parents by Hindus (generation II)

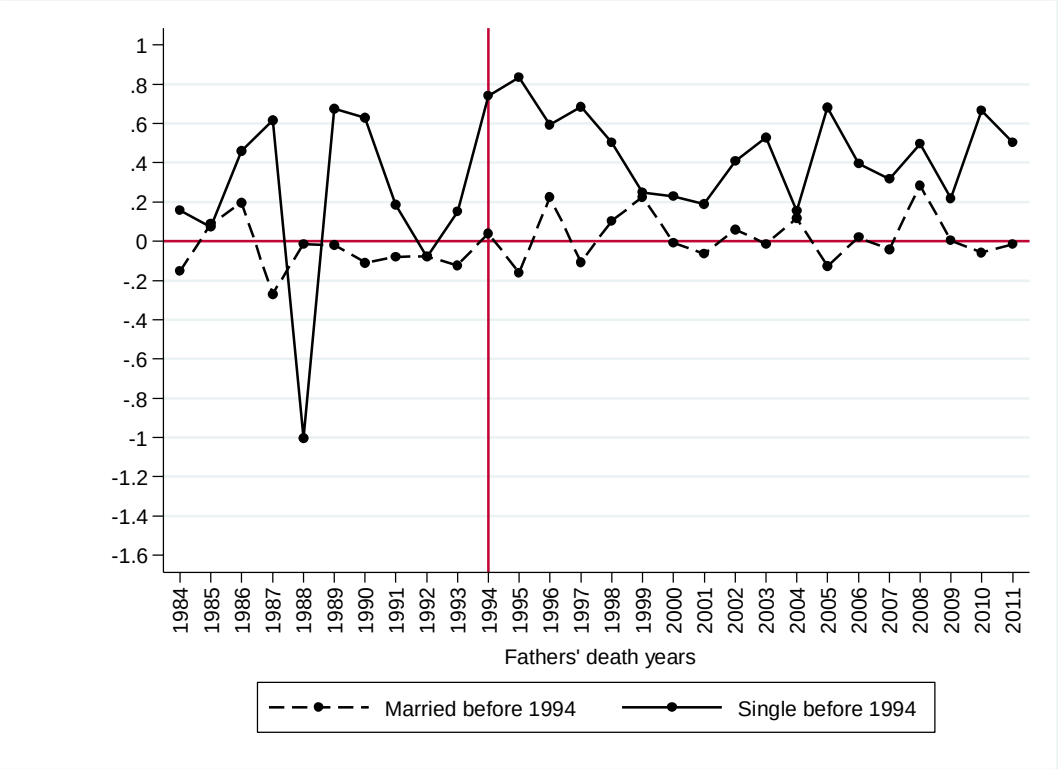


Figure 2: Coefficients on Female*Father's death year and Female*Father's death year*Single before 1994 for the share of assets received from parents by Hindus (generation II)

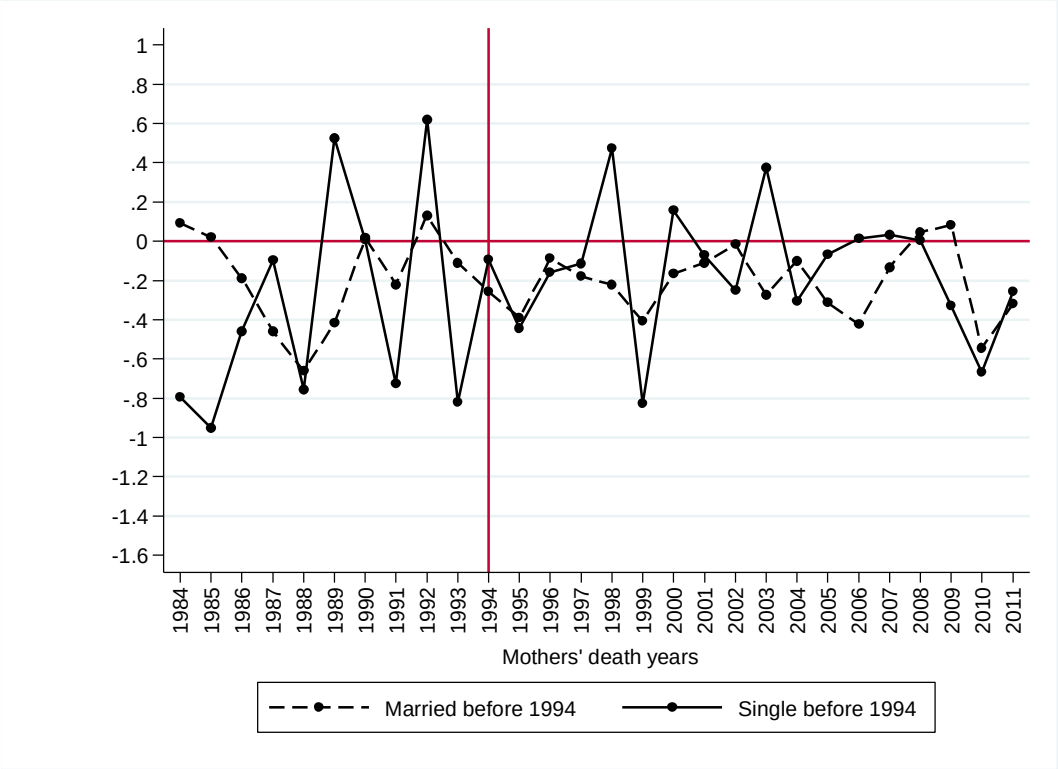
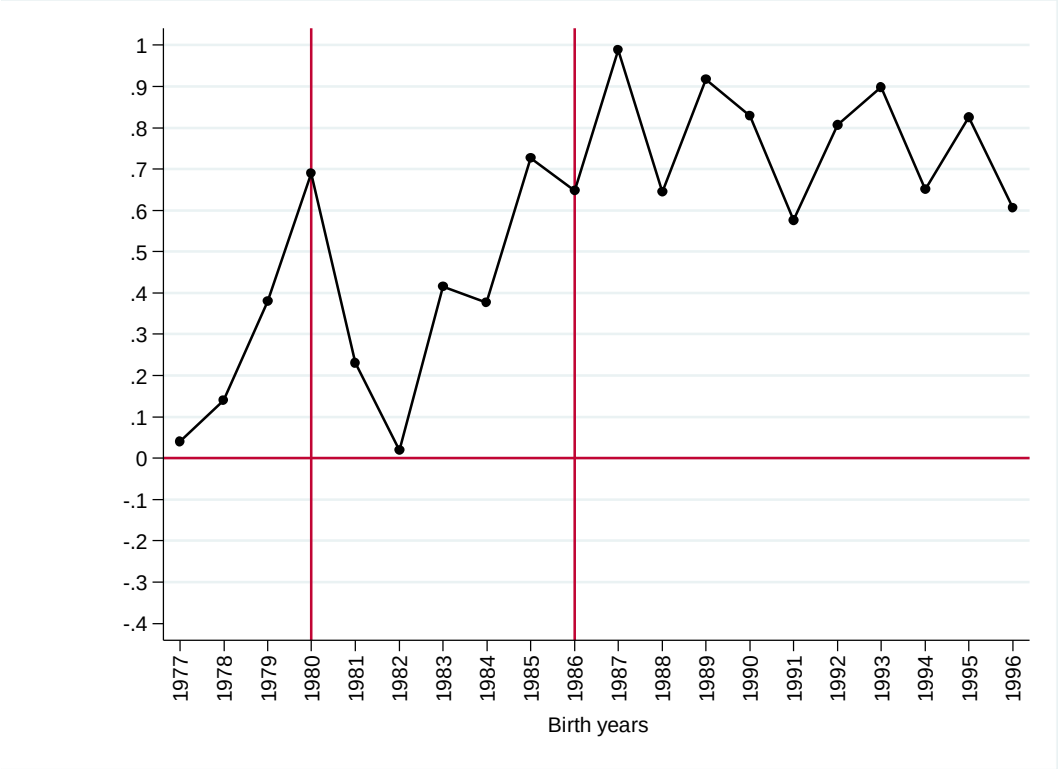


Figure 3: Coefficients on Female*Married years for the share of gifts received from parents by Hindus (generation II)

Figure 4: Coefficients on Female*Birth year for primary educational attainment (generation III)



Appendix table 1: Descriptive statistics of matched individuals

	Hindu (1)	Muslim (2)	Weighted Muslim (3)	T-test for equality (1)=(2)	(2)=(3)
Panel A: Generation II					
Share of female	0.45	0.45	0.45	0.68	0.50
Year of birth	1962	1966	1961	18.82***	-2.98***
Standard years of schooling	7.96	6.22	7.64	-22.52***	-2.49**
Married in 1994	0.72	0.65	0.74	-11.32***	2.43**
Unmarried in 1994 but married in 2011	0.22	0.27	0.21	7.74***	-1.97**
Unmarried in 2011	0.06	0.08	0.05	7.89***	-1.35
Income = < 5000 per month (rupees)	0.16	0.15	0.19	-1.72*	3.03***
Income = 5000 – 9000 per month (rupees)	0.21	0.27	0.21	9.48***	-0.80
Income = > 9000 per month (rupees)	0.19	0.12	0.17	-12.38***	-2.37**
No income	0.44	0.46	0.43	2.87***	-0.18
Father died before 1994	0.42	0.37	0.44	-6.46***	1.96**
Father died after 1994	0.35	0.37	0.35	3.15***	0.46
Father was alive in 2011	0.23	0.26	0.21	3.91***	-3.32***
Mother died before 1994	0.24	0.20	0.27	-7.35***	2.54**
Mother died after 1994	0.30	0.29	0.30	-1.09	0.16
Mother was alive in 2011	0.46	0.51	0.43	7.22***	-2.62***
Number of male GII members	2.53	2.83	2.44	13.29***	-3.08***
Number of female GII members	2.15	2.46	2.10	13.22***	-1.78*
Number of children	2.01	2.30	2.00	16.66***	-0.18
No. of observations	23779	5881	5881		
Panel B: Generation III					
Share of female	0.43	0.43	0.46	0.41	1.34
Year of birth	1985	1987	1984	7.83***	-2.56**
Married in 1994	0.04	0.03	0.05	-1.31	1.29
Unmarried in 1994 but married in 2011	0.36	0.36	0.39	0.09	1.06
Unmarried in 2011	0.60	0.61	0.56	0.40	-1.73*
Income = < 5000 per month (rupees)	0.11	0.12	0.11	1.41	0.15
Income = 5000 – 9000 per month (rupees)	0.20	0.24	0.20	4.06	0.45
Income = > 9000 per month (rupees)	0.14	0.08	0.14	-6.70***	-0.29
No income	0.55	0.56	0.55	0.35	-0.23
Father died before 2011	0.17	0.16	0.21	-0.29	1.98**
Mother died before 2011	0.06	0.04	0.08	-3.46***	1.57
Number of male GIII members	1.82	2.79	1.69	28.78***	-2.69***
Number of female GIII members	1.56	2.22	1.57	17.44***	0.41
No. of observations	6122	1826	1826		

Within-city matching. * significant at 10%; ** significant at 5%; *** significant at 1%.