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Women's Inheritance Rights and Intergenerational Transmission of Resources in India

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ABSTRACT

We use inheritance patterns over three generations of individuals to assess the impact of changes in the Hindu Succession Act that grant daughters equal coparcenary birth rights in joint family property that were denied to daughters in the past. We show that the amendment significantly increased daughters' likelihood to inherit land, but that even after the amendment, substantial bias persists. Our results also indicate a robust increase in educational attainment of daughters, suggesting an alternative channel of wealth transfer.

I. Introduction

Inheritance regulations are, based on a large number of studies on intergenerational transmission of resources, an important determinant of individual's incentives for wealth creation, social mobility, and access to opportunities (Kotlikoff and Summers 1980; Davies 1982; De Nardi 2004). Although substantial evidence points toward the existence of gender bias in inheritance legislation in many countries, impacts of such regulations have received less attention in the literature. To address this gap, we empirically explore the impact of reforms that strengthened women's inheritance rights, implemented between 1986 and 1994, in India. Results in this paper suggest that the reforms increased women's likelihood of inheriting land, the value of

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total transfers and the share of dynasty land they received, as well as their daughters' level of primary education.

Parental bequests of material wealth and human capital investments are central to transferring wealth across generations that can affect long-term distribution of resources in the economy (Becker and Tomes 1979; Stiglitz and Weiss 1981), patterns of asset accumulation and overall development through its impact on individuals' wealth and earnings opportunities (Blinder 1973). In environments where informational asymmetries and commitment problems limit the scope for raising capital against future earnings, modalities for transferring physical or human capital across generations often lead to far-reaching impacts on individuals' occupational choices, their trajectory of asset accumulation, and ultimately the distribution of political power (Cowell 1998). There is widespread view that inheritances perpetuate and may even intensify such inequalities (Wedgwood 1929). Beyond well-documented impacts on household-level outcomes, restrictions on women's ability to inherit property that have traditionally prevailed in many societies (Cooper 2008) imply that inheritances also have far-reaching gender dimensions. Although less emphasized in the literature, study of this aspect is warranted on grounds of both equity as well as efficiency.

By focusing on women's inheritance rights in India, this paper makes two contributions. First, studies show that systematic relationships between women's asset ownership and socioeconomic outcomes can emerge due to systematic differences in preferences between males and females. If, as some studies imply, females attach higher values to family needs or children's welfare and thus devote a higher share of their resources to these (Behrman 1990; Strauss et al. 2000), the extent to which females have control over assets will affect intrahousehold bargaining outcomes. In South Africa, for example, pensions received by females rather than males affected girls' anthropometric status (Duflo 2003). Such relationships need not be limited to contemporaneous outcomes but can include investment in human capital, health, or the wealth of future generations. In China, higher female incomes following agricultural reforms increased the survival rates for girls (Qian 2008). In India, exogenous increases in female income among lower castes significantly increased investment in schooling, particularly for girls (Luke and Munshi 2011).

Second, the level of female land rights is likely to affect overall productivity, especially if certain plots are cultivated exclusively by females. In African countries, insecure tenure rights of females as compared to males significantly reduces the scope for investment (fallowing), with serious negative productivity impacts (Goldstein and Udry 2008). Insecurity of females' land rights and the limited ability to transfer them across generations also increases the likelihood of conflict, making further reductions in productivity likely (Deining and Castagnini 2006).

Legal provisions to make women's inheritance rights more secure may have considerable appeal to policy makers as an option to reduce long-standing gender discrimination and improve social and productivity outcomes. While underlying cultural and social dynamics are complex, historical examples seem to support the potential of gender-focused legal interventions. More recently, changes in U.S. divorce laws have been shown to have had large impacts on female labor supply and asset accumulation and a reduction of domestic violence. In developing countries, reservation of certain political positions has been shown to affect the supply of public goods, female participation in political processes, and their willingness to contribute to public goods (Chat-

topadhyay and Duflo 2004). Changes in inheritance provisions of Bangladesh's family law changed individual behavior in predictable ways (Ambrus et al. 2010). However, cases where legal interventions have been either ineffective or even yielded unintended negative consequences abound as well. Exogenous changes in factor endowments, technology, or the functioning of other factor markets have often been more significant and effective in empowering women's than legal provisions (Quisumbing 2004). Well-intended Indian laws to overcome a legacy of caste or gender discrimination remained ineffective or, in the case of dowry provisions, may have exacerbated the phenomenon they intended to reduce (Anderson 2003).

Given the recent nationwide adoption of the inheritance reform in India in 2005, studying the extent to which earlier provisions aiming to equalize rights to inherit joint family property between females and males had the desired effect is not only of interest for research but also of policy relevance. Such analysis is made possible by the fact that the some states passed virtually identical legislation to grant daughters equal shares in inheritance relative to sons at a much earlier date; Andhra Pradesh did so in 1986, Tamil Nadu in 1989, and Maharashtra and Karnataka in 1994. The passage of sufficient time since the enactment of the reform, and the availability of data over three generations of individuals provides an opportunity to assess the impact of the legal change on women's asset endowment and their socioeconomic outcomes. In particular, we use data from the 2006 nationally representative Rural Economic and Demographic Survey (REDS) conducted by the Indian National Council for Applied Economic Research on 8,190 rural households in 16 major states of India. The survey contains detailed information on parents, siblings, and children of the household head, providing us with a quantitative measure for intergenerational transfers of both physical and human capital investments.

Two different strategies allow us to achieve identification. First, we focus on within-household differences between males and females, comparing households in reform states under the original as compared to the new legal regime. Second, we compare outcomes of females depending on whether inheritance occurred in reform states or not. Gender-and-age as well as household fixed effects, together with a range of other controls and placebo tests for non-Hindus, whose inheritance had been subject to different provisions and were not affected by the reform, are used to check the robustness of results.

We find that (i) there is a clear discontinuity in the likelihood of females inheriting land at the time of the reform and an increasing trend in this variable thereafter; (ii) reforms had a positive impact on the total value of asset transfers women received (that is, there is no evidence of complete substitution), the share of household land they received (that is, not only token amounts), and their level of land ownership at the time of the survey (that is, effects persisted); and (iii) girls but not boys whose education decisions were made under the amended inheritance regime had significantly higher levels of primary education (by some 0.37 years) than those for whom decisions were made under the old regime. To the best of our knowledge, this is one of the first studies to estimate the impact of legislative changes in inheritance rights on women's ability to inherit and their socioeconomic status in India.

The paper is structured as follows: Section II summarizes key provisions of India's inheritance law before and after the reform and briefly summarizes relevant literature

on intergenerational asset transfers and resulting hypotheses. Section III discusses identification and estimation issues, introduces the data, and discusses basic descriptive statistics. Section IV presents empirical results on land bequests, and asset ownership, and Section V explores effects on downstream outcomes such as educational attainment and age at marriage of women. Section VI concludes by drawing out implications for research and policy.

II. Background and Motivation

A. *Importance of Women's Inheritance Rights*

It is widely recognized that a unitary household model may not be an adequate description of reality and that, with heterogeneous preferences, the distribution of resources within the household affect intrahousehold bargaining and associated socioeconomic outcomes of individuals (Anderson and Eswaran 2009). Substantial evidence suggests that outcomes depend on who in the household receives certain income streams or owns the assets generating such income. This includes not only the way in which household resources are spent but also decisions on fertility and investments in the welfare of future generations such as children's education, health and nutrition.

In countries such as Cameroon, India, Kenya, Malawi, and the Dominican Republic, women have been found to consistently devote higher proportions of their income to family needs than do men (Strauss et al. 2000). Also, if their mothers control a larger fraction of family resources, children tend to do better (Thomas 1990). Increases in female's bargaining power helped reduce fertility and rates of child mortality (Dyson and Moore 1983). In South Africa, for example, pensions receipt by females rather than males affected girls' anthropometric status (Duflo 2003). In China, higher female incomes following agricultural reforms increased the survival rates for girls (Qian 2008). In India, exogenous increases in female income among lower castes significantly increased investment in schooling, particularly for girls (Luke and Munshi 2011).

In rural societies, a large fraction of households' endowment of physical capital is in the form of land, a key asset that serves not only as a source of livelihood but also a source of old-age support and status (Agarwal 1994). Restrictions on women's land rights and tenure security are likely to affect not only their bargaining power but also have been shown to lead to significant productivity losses (Goldstein and Udry 2008, Udry 1996). However, in many developing countries, preexisting norms may be biased against asset ownership by females. Although these norms may change in response to exogenous factors such as technology (Quisumbing 2004), basic considerations of fairness and efficiency of resource use warrants legislative action to establish equality between males and females.

At low levels of development, land is not only a key asset but inheritance also constitutes the main avenue for accessing it. At the same time, inheritance legislation that remains biased against females is likely to lead to persistence of inequality over time. Indeed, differences in inheritance legislation have been shown to affect economic out-

comes and entrepreneurial activity across countries (Panuzzi et al. 2009). Discussion of inheritance patterns in the literature has mostly abstracted from gender aspects. The wealth model (Becker and Tomes 1979) implies that altruistic parents provide children who have different abilities with different but efficient amounts of human capital, equating marginal returns to investment in schooling with the return to financial assets whereas the strategic bequest model (Bernheim et al. 1985) hypothesizes that parents assign bequests (inter vivos or postmortem) to children in return for care and old-age support. In a developed country setting, an equal allocation rule has been shown to generally prevail (Behrman and Rosenzweig 2004).

A well-known example of such action relates to changes in divorce legislation. In the United States, removal of the requirement for spousal consent for divorce altered the terms on which women could exit from existing relationships. The fact that states adopted such changes at different points in time allowed empirical exploration of associated impacts and has given rise to a number of empirical studies (Allen 1992; Friedberg 1998; Peters 1986; Wolfers 2006). Results point toward significant impacts of the legal change not only on the scope for household formation by those not yet married but, more importantly, also on the bargaining power of spouses within existing marriages. For example, giving women an option to exit marriages was found to lead to a one-third reduction of domestic violence not just by ending violent relationships but also by reducing violence in partnerships that were not dissolved (Stevenson and Wolfers 2006). It also reduced investment in marriage specific capital while increasing married and unmarried females' labor force participation (Stevenson and Wolfers 2007). A structural model that views the intrahousehold distribution of power as affected by outside opportunities, including legislation on the assignment of property rights if the marriage is dissolved, and conditions in the marriage market (sex ratios) points in the same direction: for U.S. data, the unitary model is rejected in favor of a bargaining model and finds that passage of a divorce law favorable to women is equivalent to a significant asset transfer to females (Chiappori et al. 2002). To the extent that inequality in opportunity for women can be traced to legal provisions, amendments in inheritance legislation could generate an enormous effect on increasing female asset endowments, to bring about positive socioeconomic outcomes typically believed to be associated with empowerment.

To the extent that inheritance provisions affect women's ability to access land and possibly other complementary assets, changes to increase women's land access through inheritance might be an attractive option to bring about greater gender equality. As the underlying channels are often complex, careful empirical investigation is needed to ascertain effects empirically and to quantify the magnitude. On the one hand, legislation to prohibit dowry in India is widely judged to have been ineffective in attaining its goal to reduce the importance of such transfers and coincides with a time period where such transfers have become more relevant (Anderson 2003). On the other hand, changes in family law having had clear impact in Bangladesh where the value of dowry and prenuptial agreements increased when constitutional changes erected legal barriers to polygamy — but decreased after additional divorce costs were imposed on men (Ambrus et al. 2010). Recent changes in India's inheritance legislation thus provide an ideal setting to explore the extent to which legal arrangements can be an important means to improve female outcomes.

B. India's Hindu Succession Act Amendment

Although India's constitution provides for equality before the law, inheritance patterns remained severely gender-biased.¹ Intestate Hindu Succession was, from 1956, governed by the Hindu Succession Act (HSA) which, following the main (*mitakshara*) Hindu law tradition (Bloom et al. 1991), distinguishes individual property from joint ancestral assets that include land (Agarwal 1994).² While the former can be bequeathed at will, rights to the latter are limited to a group, called the coparcenary that includes only male members of a dynasty. In line with these provisions, females' ability to inherit land was severely constrained and they rarely, if ever, inherited any land.³ To eliminate the gender inequality inherent in this practice, a number of states amended the 1956 HSA by passing substantively similar amendments (commonly referred as the Hindu Succession Act Amendment or HSAA) that stipulated that the daughter of a coparcener will acquire coparcenary rights by birth.⁴ Specifically, the Act was amended by Andhra Pradesh (in 1986), Tamil Nadu (in 1989), Maharashtra (in 1994) and Karnataka (in 1994).⁵ The change in the entitlements introduced by the HSAA not only makes daughters' status equal to that of sons but, by the very definition of coparceners, also implies that her share in joint family property cannot be willed away by her father.

The HSAA thus constitutes an interesting natural experiment that allows us to explore whether changes in inheritance legislation can improve women's access to physical and

1. The 1956 HSA marked an advance in terms of establishing females' right to inherit but failed to make females coparceners who acquire notional shares in joint family property, to be realized upon death. This implies that, upon intestate death of a Hindu head of household, each male coparcener first receives his share of the joint family property, a process followed by the distribution of the deceased person's notional share of joint property among all male and female heirs, normally in equal shares. To illustrate, letting m be the number of (male) coparceners and f the number of additional females, intestate succession of a Hindu head of household would have each of the former receive a share of $[(1/(m+1)) + (1/(m+1))/(m+f)]$ whereas each of the latter will receive only $(1/(m+1))/(m+f)$ with the difference being the coparcener share.

2. The other main school, Dayabhaga, prevails in Bengal and Assam According to Roy (2009), 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. Under Mitakshara, three 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 separate property, and does not recognize a coparcenary right to property.

3. To keep things simple and for purposes of clarity, we limit our discussion below to the case of intestate inheritance. This is justified on the one hand by the fact that in rural India formal wills are very rare. More importantly, as discussed below, the key innovation of the Hindu Succession Act amendment is to make females coparceners by birth, implying that their share cannot be willed away. Field studies suggest that more than 65 percent of people in India die every year without making wills, and this proportion is much higher in rural areas, suggesting the enormous importance and applicability of succession acts to govern inheritances for individuals (Agarwal 1994).

4. Inheritances, being a concurrent topic in India, both the central and the state governments have the right to amend the laws concerning it.

5. Kerala took measures in 1976 to abolish the joint family property system altogether in favor of an arrangement where all family members hold separate shares (Agarwal 1994).

human capital. This has indeed attracted research interest. A recent study assesses the amendment's impact on female empowerment, proxied by self-reported indicators of social and economic autonomy using data from the National Family Health Survey (Roy 2009). While similar in spirit, our approach differs in three important ways. First, we use various types of intergenerational asset transfers as the relevant outcome variables (rather than subjective perceptions) that are less likely to suffer from measurement error or respondent bias and also allow for multiple checks on the robustness of results.⁶ Second we are able to explicitly explore mechanisms that may drive observed results, distinguishing in particular between resource transfers at time of marriage and those related to inheritance. Finally, we are able to also assess the effects on subsequent generations in terms of children's education and pose questions for future research.

For legislation in this area to have an impact, those affected must be aware of content and implications of the law and compliance must provide benefits that are larger than the cost of enforcement efforts. At the same time, substitution effects need to be ruled out so that it is the spirit of the law, rather than just its letter that is complied, for example, by increasing the amount of physical capital transferred upon inheritance while at the same time decreasing human capital. Concerns about limited or even adverse effects of legal changes in inheritance legislation are reinforced by studies suggesting that, in some countries, gender-positive legislation failed to become effective — or even resulted in unintended negative impacts — as females were either unable to enforce compliance or positive impacts of such change were outweighed by countervailing actions in other areas (World Bank 2001). This is mirrored by evidence from India where a range of progressive legislation, aiming to modify undesirable social practices such as dowry or caste discrimination, were either ineffective or even had adverse impacts on intended beneficiaries. The direction and magnitude of impacts from legislative changes are thus an empirical issue. In addition to being of interest from a research perspective, the issue is of policy relevance for India and beyond. In India, the nationwide extension of the HSAA's main provisions in 2005 implies that a better understanding of its impact in the states that changed the provisions earlier can help inform the policy debate. At a global level, legal provisions for inheritance continue to discriminate against females and evidence on the impact of relevant reforms in India could provide insights concerning the priority to be accorded to amending these provisions.

III. Data and Estimation Strategy

A. Data and Approach

We use data from the 2006 round of the Rural Economic and Demographic Survey (REDS) conducted by India's National Council for Applied Economic Research on

6. We use land inheritance as our primary outcome variable for three reasons. First, most importantly from a substantive point of view, land has traditionally been considered as joint property of the male line in the undivided Hindu family and the primary subject of the amendment. Second, from a data perspective, information on whether land was inherited by an individual is easily obtained via recall and will be less noisy than information on other intergenerational asset transfers that may be difficult to recall. Finally, in rural India, land continues to be the main asset and source of livelihood, status, and social security; in fact, for land-owning households in our sample, it accounts for almost two-thirds of total asset value.

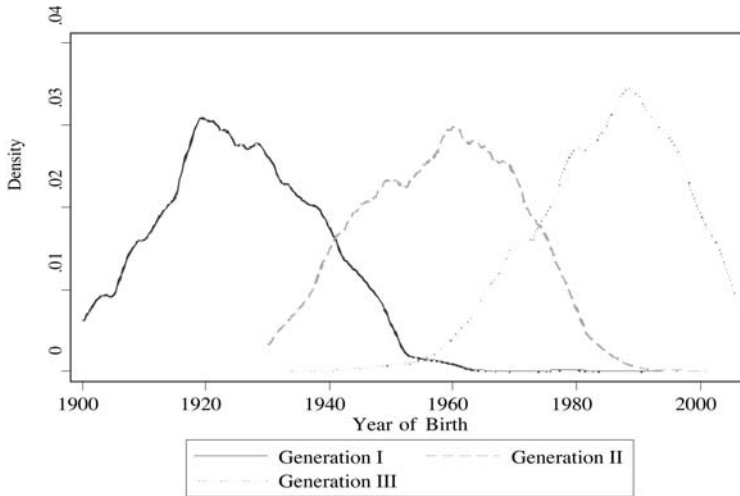


Figure 1

Age Distribution of Different Generations of Individuals

a nationally representative sample comprising India's 16 main states. To provide information on intergenerational asset transfers, the REDS complements standard household survey information with key data on the parents of the current household head (Generation I), the household head's siblings (Generation II), and the household head's children (Generation III). In particular, we focus on a sample of 8,190 rural households comprising of 72,655 individuals across the three generations. To illustrate intergenerational dynamics, Figure 1 plots the density distribution of birth years, pointing to an average current age of 80, 49, and 21 years by the 16,380, 30,488, and 25,787 members (some deceased) in Generations I, II, and III, respectively.

To understand our approach to identification, recall that the "reform states" of Andhra Pradesh, Karnataka, Maharashtra and Tamil Nadu amended the HSA in 1986, 1989, and 1994 respectively. Conditional on her father having passed away, whether or not a woman in reform states was entitled to inherit land in equal shares with her brothers then depends on the timing of her father's death. For women whose father died before the state-specific date when the amendment came into force, the 1956 HSA applied whereas for those whose father died thereafter, the rules laid down in the amendment governed any inheritance-related wealth transfers. In addition, the non-Hindu households in the sample as well as households living in nonreform states are not affected by the legal changes and can serve as potential control groups.⁷ The identification relies on a difference-in-differences strategy to estimate the impact of the Hindu Succession Act amendment, comparing the inheritance of land to males and females by fathers who died before and after the amendment of the Act across the reform and nonreform states. Methodologically, we use state-level or household-level

7. The nonreform states include Bihar, Chattisgarh, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Madhya Pradesh, Punjab, Rajasthan, Orissa, West Bengal, and Uttar Pradesh.

fixed effects, and gender-specific year of birth fixed effects to eliminate potential bias due to unobserved household characteristics, state level selection, and time-varying factors affecting outcomes of males and females, and perform a number of placebo tests to check the underlying parallel trends assumption throughout.

B. Identification Strategy

Based on the above description, we use two main ways to isolate the causal effect of the reform. First, we compare the likelihood of inheriting land by Generation II males and females belonging to the same household in the reform states before and after the HSAA came into force, as a direct measure of HSAA impact, relying on the plausible randomness of whether the household head's death occurred pre or post reform. We can do so since we observe the amounts of land inherited by siblings within a household, and the legal change is tested to affect the probability of receiving inheritance for females but not for males.⁸ Formally, the estimation equation is:

$$(1) \quad Y_{gkj} = \alpha_1 + \alpha_2 F_g + \alpha_3 F_g * D_j + \alpha_4 \mathbf{X}_j * F_g * D_j + \gamma_j + \mu_{gk} + \epsilon_{gkj}$$

where Y_{gkj} is an indicator variable for whether Generation II individual of gender g , born in year k , in household j inherited any land, F_g and D_j are indicator variables for female gender and for whether the father died after the HSA had been amended in the four reform states, \mathbf{X}_j is a vector of parental and household characteristics that includes education, caste, and land holding, γ_j and μ_{gk} are household fixed effects and gender-specific year of birth fixed effects to control for time-invariant household characteristics or time-varying factors that may affect gender-specific inheritance patterns independently from the reform.

The coefficient of primary interest is α_3 , the estimate of the amendment-induced increase in females' likelihood of inheriting land. To allow potential impacts of the HSAA to vary over time, for example, because of the time required to disseminate the law or for households to understand its implications, we also estimate specifications where $F_g * D_j$ is further interacted with indicator variables for the year of death of Generation I male. In addition, to deal with potential confounding factors we include a number of additional controls that provide an implicit check on results. For instance, robustness checks can be performed for non-Hindus in reform states (and for Hindus in nonreform states with varying notional reform dates) to check the validity of the parallel trends assumption that underlies our identification strategy.

In addition, in traditional Indian society, intergenerational asset transfers to females may occur at the time of marriage rather than the father's death. To assess whether this may confound the impact estimated, we include the relevant interactions. Finally, any HSAA-induced changes in inheritance could be magnified or obscured by unobserved heterogeneity between comparison groups. In particular, conditional on a child's age, the timing of the father's death may be correlated with the father's age at marriage,

8. To test this assumption, we estimated the impact on the likelihood of inheriting land separately for sons and daughters to determine the extent to which males can be considered a valid control group. The coefficient on Death Post-HSAA in the males-only regression is positive and insignificant, suggesting no dramatic effects of HSAA on son's likelihood of receiving an inheritance. In contrast, the coefficient on Death Post-HSAA in the females-only regression is twice as high as the coefficient in the males-only regression and is statistically significant providing circumstantial evidence in support of using males as a valid control group.

the age gap between mother and father, or the father's general health situation. Those whose fathers die earlier may come from poorer or more traditional families that could lead to an upward bias in the estimated effect of the legal reform on inheritance. To address this possibility, we include the age gap between mother and father as a robustness check.

While the above analysis provides the most direct way to assess HSAA effects, finding positive impacts of the legal change on a woman's likelihood of inheriting land is not necessarily equivalent to a positive overall reform impact. For example, fathers who are now required to transfer land to their female offspring upon inheritance may cut back on other transfers, in particular marriage-related ones, in anticipation of such bequests. Alternatively, social pressure may reduce women's ability to hold on to land they inherited or make productive use of it. To address these concerns and focus on longer-term impacts of reform, we compare various outcome variables for females depending on whether they live in a reform state and whether their father passed away before or after the HSAA taking effect. Dependent variables in this case are the share of household land inherited by the female, the total value of other gifts (pre- and postmortem) received, the value of total transfers (gifts, and land) received, and the amount of land owned in 2006 at the time of the interview. To reduce the likelihood of unobserved factors other than the legal change driving the results from such a regression, running the same regression for a sample of non-Hindus allows us to conduct a placebo test.

Although we would expect the HSAA to most directly affect land inheritance, exploring some of the downstream effects postulated in the literature can provide additional insight since developing or testing a model of general equilibrium impacts is beyond the scope of this paper. Legal changes, such as the one explored here, are of interest because by affecting females' bargaining power, they might affect outcomes in seemingly unrelated areas. For example, even in cases where actual inheritance has not yet occurred, if women can expect to inherit land or other property from her parents, such greater asset endowments may increase the returns from education. A growing literature suggests that an exogenous increase in the expected returns to education by young females can affect school enrollment. For example, there is evidence of strong but localized effects of IT centers (including call centers, data processing, and medical imaging) on school enrollment, especially in English language schools (Oster and Millett 2011). Moreover, girls in randomly selected villages where young women had been offered recruiting services were significantly more likely to be enrolled in school and also tended to have higher body-mass index than where this was not the case (Jensen 2012). Stronger inheritance rights also may improve a woman's marital prospects with important implications for her subsequent life outcomes. For instance, characteristics of a woman's spouse, and his family, her age at marriage have been shown to have significant effects on domestic violence, reproductive decisions, and her social status in her husband's home (Field and Ambrus 2008; Mobarak, Kuhn, and Peters 2007; Jensen and Thornton 2003). Early marriage has also been shown to be associated with lower educational attainment, higher maternal mortality, and high levels of child malnutrition (Caldwell et al. 1983). Using the Generation II sample of men and women allows us to apply the same strategy as in Equation 1.

Impacts on human capital of Generation III are of particular interest in two respects. Most importantly, information on educational levels by Generation III boys and girls

allows us to make inferences on possible longer-term reform effects. On the one hand, if spouses' preferences regarding the provision of education to either boys or girls differ, greater access to inherited assets may strengthen the position of Generation II females in intrahousehold bargaining and thus increase human capital by the next generation. On the other hand, substitution effects — whereby compliance with the letter but not the spirit of the HSAA results in greater land transfers to girls is outweighed by reduced access to education — might weaken or cancel out positive reform effects, possibly resulting in a negative overall impact.⁹

While available data do not allow us to fully explore the underlying mechanisms, comparison of outcomes for different cohorts of boys and girls within the same household provides at least an indirect test for longer-term effects of the HSAA on decisions regarding primary education.¹⁰ In this case, rather than the year of father's death, the relevant variable indicating regime change is whether decisions on primary education were completed under the old or the new inheritance regime. In other words, we define individuals as "treated" if they were younger than 6 years old when the reforms were put in place in different states (that is, in 1986, 1989, or 1994). All of these individuals are young enough for schooling decisions having been made under the changed inheritance regime while at the same time allowing us to observe educational outcomes in 2006 data.¹¹

C. Descriptive Statistics

Basic attributes for the three generations in our sample is summarized in Table 1, for the entire sample as well as reform and nonreform states and, for the latter, households where the Generation I male (generally the head's father) is still alive or, in case he is not, whether, based on the timing of the death, inheritance was subject to the old or the new regime. A total of 5,616 households are in the nonreform states and 2,574 in the reform states. Not surprisingly, there are significant differences between the reform and nonreform states across almost all observable characteristics. As shown in Panel A, 93 percent of Generation I households overall are Hindu, 21 percent belong to lower caste groups, and 74 percent owned land. Land accounts for 59 percent of total wealth for land owning generation I households.¹² Of the 2,574 Generation I males in reform states, 662 were alive at the time of the survey while 901 and 1011 died under

9. Such gender-specific specialization, where girls have comparative advantage in human capital rather than land-intensive economic pursuits is suggested in a number of studies (Estudillo et al. 2001).

10. The REDS survey does not contain information on the father of the wife of the household head (when the head was male) nor information on the father of the head of the household when the head was female, thus restricting our ability to shed light on the underlying mechanism that mediates the increase in girls education after the amendment as data on the amount of assets inherited and the applicable inheritance regime (that is, whether her father is still alive or when he passed away) for the mothers of Generation III girls are unavailable.

11. First, primary education decisions for those between zero and five years when reforms became effective would have been made under the changed inheritance regime. Decisions for those 13–18 years old when reforms were put in place would, under the assumption of elementary education being completed by age 13, have been made under the old regime.

12. Value of assets for each household is computed from current (2006) values (in Rs.) of all residential and commercial property, land ownership, jewelry, consumer durables, livestock, mechanized, nonmechanized assets, and savings and investments in financial institutions as reported by the household head.

Table 1
Household Characteristics

| | Total Sample | Reform States Only | | | | |
|-------------------------------|--------------|--------------------|-----------|----------------|--------------------|-------------------|
| | | Type Of State | | G 1 Male Dead | | |
| | | Reform | Nonreform | G 1 Male Alive | Died Before Reform | Died After Reform |
| Panel A: Generation I | | | | | | |
| Year of birth | 1926 | 1922 | 1929 | 1938 | 1919 | 1929 |
| Land ownership (share) | 0.74 | 0.73 | 0.77*** | 0.73 | 0.72 | 0.74** |
| Area owned (acres) | 6.47 | 5.24 | 7.06*** | 4.21 | 6.68 | 4.65*** |
| Male schooling (years) | 2.18 | 2.23 | 2.18* | 2.24 | 2.25 | 2.22* |
| Female schooling (years) | 1.35 | 1.43 | 1.25* | 1.45 | 1.43 | 1.41 |
| Hindu (share) | 0.93 | 0.96 | 0.92*** | 0.96 | 0.96 | 0.97 |
| SC/ST | 0.21 | 0.21 | 0.22* | 0.18 | 0.21 | 0.22 |
| Male children (no.) | 2.29 | 2.22 | 2.31** | 2.2 | 2.19 | 2.21 |
| Female children (no.) | 2.15 | 2.13 | 2.22** | 2.12 | 2.12 | 2.14* |
| Number of observations | 8,190 | 2,574 | 5,616 | 662 | 901 | 1,011 |
| Panel B: Generation II | | | | | | |
| Males | | | | | | |
| Year of birth | 1956 | 1955 | 1956 | 1962 | 1950 | 1961 |
| Years of schooling | 4.49 | 4.64 | 4.16* | 4.68 | 4.78 | 4.26* |
| Inherited any land (share) | 0.61 | 0.58 | 0.62** | 0.04 | 0.68 | 0.71* |
| Area inherited (acres) | 2.46 | 2.56 | 2.31* | 0.01 | 2.38 | 2.14* |
| Gifts given values | 1,975 | 2,267 | 1,624*** | 2,675 | 1,612 | 2,930*** |

(continued)

Table 1 (continued)

| | Total Sample | Type Of State | | Reform States Only | | | |
|---|--------------|---------------|------------|--------------------|--------------------|-------------------|-------------------|
| | | Reform | Nonreform | G 1 Male Alive | G 1 Male Dead | | Died After Reform |
| | | | | | Died Before Reform | Died After Reform | |
| Panel B: Generation II (continued) | | | | | | | |
| Total transfer values | 445,896 | 317,702 | 511,813*** | 299,624 | 299,509 | 349,725*** | |
| Number of observations | 15,586 | 5,417 | 10,169 | 1,335 | 1,828 | 2,254 | |
| Females | | | | | | | |
| Year of birth | 1958 | 1958 | 1956 | 1964 | 1954 | 1962 | |
| Years of schooling | 3.24 | 3.51 | 3.19* | 3.54 | 3.52 | 3.54* | |
| Inherited any land (share) | 0.08 | 0.11 | 0.06*** | 0.03 | 0.08 | 0.17*** | |
| Area inherited (acres) | 0.25 | 0.41 | 0.16*** | 0 | 0.32 | 0.56** | |
| Value of gifts given | 6,581 | 8,284 | 5,852*** | 8,513 | 6,307 | 9,543*** | |
| Number of observations | 14,902 | 4,346 | 10,556 | 1,146 | 1,555 | 1,645 | |
| Panel C: Generation III | | | | | | | |
| Males | | | | | | | |
| Year of birth | 1985 | 1985 | 1986 | 1991 | 1979 | 1986 | |
| Years of schooling | 5.33 | 5.43 | 5.29* | 5.67 | 5.06 | 5.23** | |
| Number of observations | 13,905 | 3,682 | 10,223 | 822 | 1,338 | 1,522 | |
| Females | | | | | | | |
| Year of birth | 1985 | 1984 | 1985 | 1992 | 1979 | 1986 | |
| Years of schooling | 4.15 | 4.46 | 3.76*** | 4.83 | 3.97 | 4.61** | |
| Number of observations | 11,882 | 3,164 | 8,718 | 695 | 1,103 | 1,366 | |

Notes: Authors' computations using the NCAER ARIS-REDS 2006 Survey. Stars indicate significance of mean differences across reform and nonreform states, as well as across the timing of Generation I male's death. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

the old and the new inheritance regime, respectively.¹³ While differences in age and associated characteristics are in line with expectations, none of these characteristics are statistically significant different between those who died before and after the reform.¹⁴

Panel B, which provides data on 30,488 Generation II individuals, is of particular interest. While 61 percent of males inherited land, only 8 percent of females did in the overall sample. More interestingly, males' likelihood of inheriting land was virtually unaffected by the HSAA (with 68 percent of the males whose father died before HSAA inheriting land compared to 71 percent of the males whose fathers died after the HSAA). By contrast, for females the corresponding figures are 8 percent and 17 percent, significantly different from each other, thus pointing toward a significant impact of the HSAA at least at the descriptive level. Although, with approximately Rs. 52,000, the value of total transfers received by females' post-HSAA remained significantly below that for males who received almost seven times this amount, it was significantly above what had been received before the HSAA came into force.

Panel C presents information on educational attainment by Generation III individuals. Average level of education for the entire sample of Generation III females is 4.15 years (six years of education correspond to completion of elementary school). While if we look at the sample of Generation II females, the average level of education is 3.24 years, lower than Generation III. In addition, the average level of education of Generation I females is 1.35 years, significantly lower than their daughters indicating that educational attainment among women has been increasing over time.

IV. Econometric Results

A. Land Inheritance

Results from different specifications of the linear probability model of Equation 1 for the 6,891 individuals in 1,805 land-owning Hindu households where the Generation I male had passed away at the point of the survey are presented in Table 2. A basic specification (Column 1) is complemented by results exploring time-varying effects of the HSAA (Column 2), heterogeneous effects by household characteristics such as parental education, caste, age gap between mother and father, and the year of marriage (Columns 3 and 4). A placebo test using the 345 non-Hindu households in the four reform states is included in Column 5.

The basic result in Column 1 of Table 2 suggests that females are significantly less likely (by 72 percent) to inherit land than males, after controlling for household fixed effects and gender-specific year of birth fixed effects. However, females whose father died after the HSAA had become effective in the four reform states are 15 percentage

13. Of 8,190 Generation I females, 30 percent are alive in 2006, 33 percent died before the reform, and 37 percent died after the reform. Approximately 3 percent of Generation I females own land, and 90 percent are illiterate. There is approximately zero inheritance from Generation I females to Generation II individuals and including mothers status or landholding makes no difference to the main results.

14. Approximately 11 percent of the 8,190 sampled households have a female head. When the head is female, data is collected on the siblings and parents of her husband. We are thus able to construct three generations pertaining to her husband's family for our analysis.

Table 2
Effect of the Hindu Succession Act Amendment on Women's Inheritance of Any Land

| | Hindu | | | Non-Hindu |
|---|----------------------|---------------------|----------------------|----------------------|
| | (1) | (2) | (3) | (5) |
| <i>Female</i> | -0.724 [0.175]*** | -0.71 [0.164]*** | -0.723 [0.205]*** | -0.541 [0.172]*** |
| <i>Female*father's death post-HSAA</i> | 0.145 [0.036]*** | | 0.152 [0.034]*** | 0.081 [0.063] |
| <i>Female* death pre-1-6 years</i> | | 0.009 [0.040] | | |
| <i>Female* death post-0-5 years</i> | | 0.101 [0.047]*** | | |
| <i>Female* death post-6+ years</i> | | 0.235 [0.042]*** | | |
| <i>Female* death*father's education</i> | | | 0.017 [0.033] | -0.102 [0.085] |

| | | |
|--|------------|---------|
| <i>Female* death*father's landholding</i> | -0.034 | -0.07 |
| | [0.013]*** | [0.054] |
| <i>Female* death*SC/ST</i> | 0.182 | |
| | [0.061]** | |
| <i>Female*death*married post-HSAA</i> | 0.043 | 0.051 |
| | [0.056] | [0.115] |
| <i>Female*death*mother's education</i> | 0.005 | 0.074 |
| | [0.062] | [0.055] |
| <i>Female* death*age gap mother-father</i> | 0.056 | 0.106 |
| | [0.048] | [0.068] |
| Observations | 6,891 | 345 |
| R-squared | 0.74 | 0.88 |

Notes: The sample consists of Generation II males and females in the four reform states. *Female* is an indicator variable for whether the individual is female. *Father's death post-HSAA* is an indicator variable for whether the father of the individual died after the reform. *Father's death pre 1-6 years* is an indicator variable for whether the death of the father occurred in the six years leading up to the reform. *Father's death post-0-5 years* is an indicator variable for whether the father died in the first five years after the reform and *Father's death post-6+ years* is an indicator variable for whether the father died in the sixth year after the reform and beyond. *Father's education*, *Fathers landholding*, and *age gap between mother and father* are continuous variables. *SC/ST* refers to scheduled castes or scheduled tribes. *Married post-HSAA* is an indicator variable for whether the individual married after the reform. All regressions include gender-specific year of birth fixed effects and household fixed effects. All pair wise interactions are included but not shown. Robust standard errors in brackets are clustered by village * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent

points more likely to inherit land than those whose father died before the reform. This result points toward a clear and relatively large impact of the HSAA on increasing females' likelihood to inherit land. However, it also suggests that the legal change alone was insufficient to completely compensate for females' underlying disadvantage. To allow for the possibility that learning increases the effect of the legal change over time and to check the robustness of our results, we include additional pre- and postbinary variables that indicate the occurrence of death immediately preceding or following the reform. This allows us to differentiate between a level and a trend effect of the reform. Specifically, in Column 2, *pre-1-6 years* is an indicator variable for whether death of the father (and thus inheritance) occurred six years prior to the reform. Similarly, *post-0-5* indicates father's death in the five years immediately after the legal change and *post-6+* is an indicator variable for death six or more years after reforms became effective. Results point toward no effect prereform (placebo test), thereby increasing our confidence in estimating a causal effect. At the same time, we find a slightly lower point estimate (10.1 percent) in the first as compared to the second post-amendment period (where the effect increases to 23.5 percent) which may be due to increased knowledge of the reform over time. Results from the relevant tests illustrate that we can reject equality of coefficients between pre- and postperiods and between the first and second post-reform periods but that even in the second postreform period, the HSAA failed to compensate for the anti-female bias inherent in land inheritance in India.¹⁵

To explore heterogeneous effects of the reform by parental background, we include interactions of the treatment variable with the level of education, land endowment, and caste of Generation I male in Column 3. Interestingly, reform effects are estimated to be slightly more pronounced for SC/ST (Scheduled Castes or Scheduled Tribes) households and for households with lower amounts of land that might be reflective of the availability of alternative resources of substitution. This is consistent with recent findings of Luke and Munshi (2011) who suggest that lower caste households may be more receptive to new opportunities or perhaps have stronger incentives to move away from traditional norms. Two further robustness checks are included in Column 4. As noted, unobserved heterogeneity between comparison groups may obscure or amplify HSAA-induced differences in inheritance. Intergenerational asset transfers also may occur at the time of marriage rather than the father's death. Column 4 suggests that our results are robust to including the interaction between marriage after the HSAA and conditioning on age gap between mother and father, or age of death of mother, or mother's education. In all of these cases, coefficients on the relevant variables remain insignificant while the coefficient on the main explanatory variable (female*father's death post-HSAA) remains virtually unchanged. We conclude that, although there is need to check the extent to which the HSAA may affect intergenerational transfers of nonland assets (and the sustainability of such effects), it affects transfers of land primarily through inheritance.

As a final robustness check, Column 5 reports results from a placebo test that applies our estimation strategy to non-Hindu households in the reform states who, by definition, should be unaffected by the HSAA. This allows us to test whether coef-

15. The F statistic for equality of pre- and post-coefficients is 32.28 ($p=0.00$), and equality of the two post-periods is 3.75 ($p=0.05$), suggesting that the coefficients are statistically different from each other.

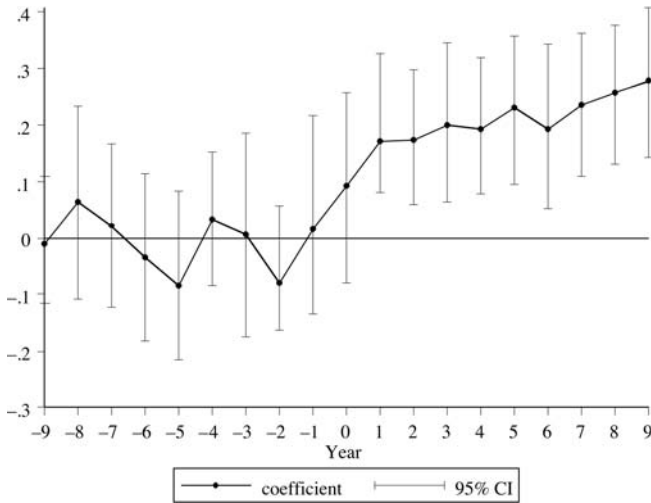


Figure 2
Year Effect of the Reform

ficient estimates mistakenly pick up time trends in patterns of inheritance that are independent of the legal change. While results point toward a slightly smaller anti-female bias, the lack of significance for the relevant interaction suggests that the reform did not affect non-Hindus, further allaying concerns about unobserved factors driving our main result. In light of the limited number of non-Hindu individuals in our sample, we conduct an additional placebo test where we use Hindus in the nonreform states with various cutoffs for the reform date as shown in Appendix Table A1. While there is evidence of significant gender bias, the timing of father's death before or after either 1986 (Column 1) or 1989 (Column 2) or 1994 (Column 3) has no effect on the likelihood of females inheriting land.

Figure 2 shows the time effect of the reform together with the 95 percent confidence interval. Before the reform, the coefficients tend to fluctuate around zero and are statistically insignificant throughout. There are no detectable changes before the legal amendment, with a sharp increase in land bequests to daughters occurring only after HSAA became effective, suggesting that the timing of the amendment can be considered plausibly orthogonal to other trends in woman's inheritance of land. The effect persists over time, showing a modest but significant upward trend, in line with a gradual pattern of dissemination and learning. This graph lends support to the identification strategy and the consequent validity of the effect of the HSA amendment.

B. Total Value of Transfers

As positive impacts from inheritance legislation could be counteracted by substitution effects, it is important to assess whether the increase in land received by females at the time of their father's death was compensated by a reduction of other asset transfers. Subject to the limitations imposed by the data that do not explicitly include dowry, re-

Table 3

Effect of the Hindu Succession Act Amendment on Women's Land Inheritance and Other Transfers

| | Share Of Land Inherited (1) | Land Owned (Log) (2) | Total Gifts Given (Log) (3) |
|---|--------------------------------------|-------------------------------|--------------------------------------|
| Reform state*father's death post-HSAA | 0.021 [0.008]** | 0.117 [0.022]*** | 0.137 [0.160] |
| Observations | 9,877 | 9,877 | 9,877 |
| R-squared | 0.62 | 0.62 | 0.58 |
| <i>RS*father's death post-HSAA</i> | 0.023 [0.009]** | 0.109 [0.0417]*** | 0.124 [0.157] |
| <i>RS *married post-HSAA</i> | 0.012 [0.013] | 0.077 [0.13] | 0.356 [0.180]* |
| <i>RS * death post-HSAA*father's land</i> | -0.015 [0.008]* | 0.028 [0.018] | 0.312 [0.208] |
| <i>RS* death post-HSAA*father's education</i> | 0.003 [0.003] | 0.056 [0.042] | 0.003 [0.006] |
| <i>RS *father's death post-HSAA*SC/ST</i> | 0.004 [0.002]* | 0.072 [0.025]* | -0.001 [0.009] |
| <i>RS *death post-HSAA*married post-HSAA</i> | -0.008 [0.006] | -0.041 [0.032] | 0.317 [0.242] |
| <i>RS *death post-HSAA*mothers education</i> | 0.021 [0.014] | 0.066 [0.058] | 0.167 [0.112] |
| <i>RS *death post-HSAA*age gap mother- father</i> | 0.007 [0.005] | 0.087 [0.056] | 0.002 [0.002] |
| Observations | 9,877 | 9,877 | 9,877 |
| R-squared | 0.62 | 0.63 | 0.58 |

Notes: The sample consists of all ever-married generation II Hindu females in the reform and nonreform states. Reform State (RS) is an indicator variable that takes the value 1 if the state is Andhra Pradesh, Tamil Nadu, Maharashtra or Karnataka and zero otherwise. All regressions include state specific year of birth fixed effects and household fixed effects. All pair wise interactions are included but not shown. Robust standard errors in brackets are clustered by village * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

sults provide no basis to substantiate the belief that substitution effects may be present. Table 3 reports the results on land ownership and other related transfers to females in reform and nonreform states with Panels I and II showing the basic results, and results with additional controls such as the interaction with the date of marriage, father's education, caste status, mother's education and the age gap between father and mother, respectively. Irrespective of whether additional controls are included or not, the share

of land inherited by females (Column 1) and total land owned (Column 2) increased significantly for those in reform states whose father died after the state-specific date when the amendment of the Hindu Succession Act took effect. This specification thus supports our earlier results and also suggests a persistent impact of higher inheritance-related transfers on current land ownership. The relevant coefficients in the placebo test (appendix Table A2) for non-Hindu females are all insignificantly different from 0, increasing our confidence in the fact that the estimated effects can indeed be attributed to the HSAA rather than other unobservable factors.

In addition, the coefficient on the total value of all nonland gifts — mainly jewelry and consumer durables — daughters received from their parents (Column 3) is positive but insignificant. Results in Column 3, Panel II, suggest that the value of gifts in reform states is slightly higher (at the 10 percent level) for those females who married post-HSAA. Taken together, these results support the notion that the HSAA induced increase in females' land inheritance was not compensated for by a contemporaneous reduction in other transfers but had a positive net effect.

V. Exploration of Downstream Effects

Table 4 shows the results for (ever-married) Generation II males and females whose marriages occurred before and after the HSAA came into force. Additionally, we match these individuals based on the father's status because Generation II females whose fathers' died before HSAA are unlikely to have been beneficiaries of the reform. On the other hand, Generation II females whose fathers' are alive or died after the reform are likely to experience stronger inheritance rights after the reform that could lead to an effect on their marriage market outcomes. It is important to note that Generation II's mothers (or widows) were not considered coparceners after the reform. Thus, the status of the widow is unaffected after the reform that makes comparisons of Generation II females based on the father's status a robust way to parse out differential effects of stronger inheritance rights on women's marriage market outcomes. In Columns 1–3, we compare the age at marriage for Generation II males and females whose father's have died before HSAA. While females on average have a significantly lower age at marriage than males (by 2.36 years), females who married after the reform (but whose fathers have died before the reform) have no additional effect on their age at marriage. The coefficient on the female*married interaction is small and insignificant, suggesting that, within the same household where father had died before the reform, the age at marriage of daughters, relative to sons, did not change depending on whether the marriage occurred before or after HSAA.

However, in Columns 4–6, females who married after HSAA (but whose fathers have died after HSAA) have a significantly higher age at marriage (by 0.54 years) than females who married before HSAA. This result points toward a clear and positive impact of HSAA on the age at marriage for females whose marriages occurred post-HSAA. Recent studies (Jensen and Thornton 2003; Field and Ambrus 2008) suggest that large improvements in women's wellbeing may be achievable even with small increases in female age at marriage suggesting that the relatively modest magnitude of the impact (of half a year on average) could potentially be associated with significant improvements in women's socioeconomic status in India. To explore the extent to

Table 4
Effect of the Hindu Succession Act Amendment on Age at Marriage

| Dependant Variable | Age at Marriage | | | | | |
|--|-------------------------|----------------------|----------------------|---------------------------------|----------------------|----------------------|
| | Father Died Before HSAA | | | Father Alive or Died After HSAA | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| <i>Female</i> | -2.354 [0.154]*** | -2.317 [0.154]*** | -2.348 [0.153]*** | -2.358 [0.135]*** | -2.356 [0.135]*** | -2.364 [0.136]*** |
| <i>Female*married post-HSAA</i> | 0.101 [0.269] | 0.103 [0.249] | 0.149 [0.234] | 0.538 [0.263]** | 0.631 [0.265]** | 0.674 [0.278]** |
| <i>Female*married*father's education</i> | | 0.297 [0.215] | 0.278 [0.235] | | 0.213 [0.114]* | 0.258 [0.106]** |
| <i>Female*married*father's landholding</i> | | -0.019 [0.584] | -0.231 [0.556] | | -0.341 [0.359] | -0.641 [0.359] |
| <i>Female*married*SC/ST</i> | | | 0.746 [0.519] | | | 0.068 [0.742] |
| <i>Female*married*OBC</i> | | | -0.414 [0.403] | | | -0.329 [0.661] |
| <i>Female*married*mother's education</i> | | | 0.016 [0.041] | | | 0.058 [0.036] |
| Observations | 3,245 | 3,245 | 3,245 | 5,210 | 5,210 | 5,210 |
| R-squared | 0.38 | 0.38 | 0.38 | 0.38 | 0.38 | 0.38 |

Notes: All regressions include gender-specific year of birth fixed effects and household fixed effects. All pair wise interactions are included but not shown. Robust standard errors in brackets are clustered by village * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

Table 5
Effect of the Hindu Succession Act Amendment on Educational Attainment

| | Hindu Girls | | Non-Hindu Girls | Hindu Boys |
|--|---------------------|--------------------|-------------------|-------------------|
| | (1) | (2) | (3) | (4) |
| <i>Reform state*young</i> | 0.373 [0.059]*** | 0.243 [0.101]** | -0.043 [0.026] | -0.06 [0.114] |
| <i>Reform state*young*father's land holding</i> | | 0.005 [0.011] | 0.011 [0.093] | 0.024 [0.018] |
| <i>Reform state*young*father's education</i> | | 0.024 [0.013]* | 0.019 [0.023] | 0.007 [0.003]* |
| <i>Reform state*young*mother's education</i> | | 0.009 [0.004]* | 0.021 [0.016] | 0.008 [0.012] |
| <i>Reform state*young*SC/ST</i> | | 0.083 [0.131] | | 0.085 [0.056] |
| <i>Preform state*young*age gap mother-father</i> | | 0.009 [0.012] | 0.014 [0.010] | 0.017 [0.011] |
| Observations | 7,762 | 7,762 | 679 | 9,247 |
| R-squared | 0.13 | 0.16 | 0.32 | 0.17 |

Notes: The sample consists of Generation III males and females across reform and nonreform states. All regressions include state specific year of birth fixed effects and household fixed effects. All pair wise interactions are included but not shown. Robust standard errors in brackets are clustered by village * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

which estimated effects may be driven by parental background, we include interactions of the treatment variable with the level of education and land endowment of the father in Column 2. Reform effects appear to increase with father's level of education suggesting that perhaps awareness and learning of legal changes by the more educated. In light of the view that early age at marriage is a substantial barrier to social and economic development in India, our results at least provide some evidence suggesting a favorable outcome in the marriage market for females which could potentially generate wider implications for both maternal and child health outcomes in the future.¹⁶

Table 5 shows the basic results on educational attainment of Generation III Hindu girls (Column 1), specifications with interactions for land ownership, education, caste, parents' education, and age gap between the mother and father to assess whether such

16. To the extent that women who own property, for example, land, have a stronger fall-back position outside marriage (outside option) and therefore greater bargaining power within it as compared to landless women, could be reflected in greater autonomy in household choices. Ownership of land by a woman can also have indirect impact on her bargaining power via her monetary contribution to household expenditure, even aside from being regarded more highly by society in general and hence within her family as well (Agarwal 1994). To understand whether the woman enjoys better status in her marital family if she brings into her marriage the (potential) possibility of inheriting permanent property from her parental family is of considerable interest and something that we hope to explore in detail in future work.

effects varied by socioeconomic status (Column 2), as well as various placebo tests using non-Hindu girls and boys (Columns 3–4). We find that, after controlling for state specific year of birth fixed effects and household fixed effects, girls whose educational decisions were made after the amended inheritance regime came into force had 0.37 more years of elementary schooling than their older cohorts (Column 1).¹⁷ Effects are estimated to not differ significantly by father's land holding or caste — though parents' education appears to have a larger effect on girls' schooling — suggesting that overall effects are relatively uniform across the socioeconomic spectrum (Column 2).

To explore whether our estimates mistakenly pick up broader trends in educational attainment that are independent of legislative provisions, we present results of equivalent regressions for educational attainment of non-Hindu girls in Column 3. The hypothesis of the HSAA having affected outcomes by this group is rejected; the negative sign and small size of the estimated coefficient allows us to rule out existence of a common trend in female education across religions. This test also addresses further omitted variable concerns that the inheritance rights reform was part of broader policy changes that were correlated with female education and hence yielded biased estimates. If this were true, one would observe the effect on non-Hindu women as well, unless these policies were differentially targeted at Hindu women only. It is hard to imagine alternative policies in the reform states that specifically affected educational attainment of the younger cohort of Hindu girls but had no corresponding effect on non-Hindu girls in a manner correlated with HSAA.

We also examine the impact of the reform on education of boys (Column 4) in order to investigate the possible existence of any spillover effects, since change in inheritance law is a zero-sum game for the family. In other words, improved inheritance rights for daughters necessarily imply lower rights for sons. Anticipating this, parents may want to compensate their sons by investing more in their education (positive spillover). But on the other hand, with sons getting less, future household income might be adversely affected if expected income from daughters with better inheritance rights is not large enough, leading to a tightening of the budget constraint. With parents now having to educate their daughters in order to equip them with the necessary skills required to be productive on their share of property under the new inheritance regime, this may lead to a reduction in the investment in education of sons at the margin (negative spillover). The effect on the education level of sons is presented in Column 4. Remarkably, we find no evidence that exposure of women to the inheritance rights reform had any impact on the education levels of their brothers on average. It is interesting to note that there appears to be a small negative impact on the education level of sons for the Hindu sample (Column 4), but this is not significant suggesting that expected gain in terms of future income from daughters following their empowerment through the reform more than compensated for the loss in terms of future income from

17. Interestingly, the estimated effect is quantitatively similar to what has been in the literature on other programs. For instance, school feeding, deworming, and conditional cash transfer schemes in developing countries which, due a randomized roll-out, have been amenable to rigorous evaluation, have been shown to lead to program effects in the range of 0.1 to 0.6 years. Although adjustment is required for the fact that the educational impacts of inheritance reform will not be instantaneous, the large estimated effects, together with the limited cost of such reform imply that changing inheritance legislation is a potent mechanism to improve not only women's asset ownership but also human capital accumulation by the next generation.

sons, such that the household budget constraint was relaxed, leading to an increase in the educational investment of daughters without any adverse effect on that of sons.

VI. Conclusion

While developing countries have made considerable progress in equalizing economic opportunities for women, inheritance legislation remains, in many cases, strongly gender-biased. The fact that failure to address inheritance issues could potentially undermine progress in female empowerment made in other domains implies that this is an urgent issue. Reform of inheritance laws in India, in the form of state-level amendments to the Hindu Succession Act, provides an interesting natural experiment to explore whether and to what extent such efforts have been effective, thus providing potentially important lessons for India (where similar changes have been made, in 2005, on a national scale), and for other countries where inheritance rights remain severely biased against women.

A unique data set containing information on demographic characteristics, patterns of inheritance, and asset ownership over three generations of individuals allows us to examine intergenerational transfers of physical and human capital following amendments in inheritance legislation in India. We find that the HSAA significantly increased women's likelihood to inherit land, although it did not fully compensate for the underlying gender inequality. At the same time, the finding of a significant increase in girls' educational attainment after the HSAA suggests that the Act led to genuine improvement in women's socioeconomic status, rather than a substitution away from human capital to physical capital transfers by parents to their daughters following the legislative amendment.

While we obtain robust evidence in favor of legal changes having affected female inheritance, there are several areas where further research could improve our understanding of the dynamics of legal and behavioral change. For instance, since the effects of law change fall significantly short of its objective of fully equalizing women's status to that of men, efforts to identify factors that lead to differential impact and ways to close this gap, for example, through information campaigns focused on specific target groups, also could help to better understand the channels through which such legal changes affect behavior. In addition, there is a possibility that such legal reforms prompt changes in more fundamental aspects of households' reproductive behavior, the dynamics of which would need to be understood. Furthermore, strategic behavior on the part of parents in terms of substituting property away from joint to separate, or perhaps more will writing could potentially disinherit daughters leading to an adverse affect on women's asset ownership in the future. Exploration of these effects also would allow a better appreciation of the magnitude and incidence of associated welfare effects.

Table A1*Robustness Check: Effect Amongst Hindu Women in Nonreform States*

| | Any Land Inherited | | |
|--|----------------------|----------------------|----------------------|
| | (1986) (1) | (1989) (2) | (1994) (3) |
| <i>Female</i> | -0.932 [0.285]*** | -0.814 [0.262]*** | -0.714 [0.215]*** |
| <i>Female*father's death post-HSAA</i> | 0.245 [0.236] | 0.281 [0.267] | 0.247 [0.242] |
| <i>Female* death*father's education</i> | 0.317 [0.414] | -0.102 [0.085] | 0.015 [0.031] |
| <i>Female* death*father's landholding</i> | 0.126 [0.217] | -0.07 [0.054] | -0.034 [0.033] |
| <i>Female* death*SC/ST</i> | 0.121 [0.129] | 0.05 [0.145] | 0.182 [0.161] |
| <i>Female*death*married post-hsaa</i> | 0.194 [0.239] | 0.236 [0.247] | 0.043 [0.056] |
| <i>Female*death*mother's education</i> | 0.317 [0.333] | 0.074 [0.055] | 0.005 [0.062] |
| <i>Female* death*age gap mother-father</i> | 0.077 [0.056] | 0.106 [0.147] | 0.056 [0.048] |
| Observations | 13,278 | 13,278 | 6,891 |
| R-squared | 0.71 | 0.71 | 0.74 |

Notes: The sample consists of generation II Hindu males and females in the nonreform states. All regressions include gender-specific year of birth fixed effects and household fixed effects. All pair wise interactions are included but not shown. Robust standard errors in brackets clustered by village. * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent

Table A2*Robustness Check: Effect Among Non-Hindu Women Across Reform and Nonreform States*

| | Share of Land Inherited (1) | Land Owned (Log) (2) | Total Gifts Given (Log) (3) |
|--|-----------------------------------|----------------------------|-----------------------------------|
| <i>RS*father's death post-HSAA</i> | 0.026 [0.32] | -0.387 [0.493] | 0.223 [0.414] |
| <i>RS* death post-HSAA*father's land holding</i> | 0.123 [0.101] | -0.074 [0.084] | 0.126 [0.217] |

(continued)

Table A2 (continued)

| | Share of Land Inherited (1) | Land Owned (Log) (2) | Total Gifts Given (Log) (3) |
|--|-----------------------------------|----------------------------|-----------------------------------|
| <i>RS*father's death post- HSAA*father's education</i> | 0.002 [0.003] | 0.277 [0.482] | 0.121 [0.129] |
| <i>RS*father's death post- HSAA*married post-HSAA</i> | -0.023 [0.019] | -0.061 [0.044] | 0.206 [0.147] |
| <i>RS*married post-HSAA</i> | 0.027 [0.036] | 0.155 [0.251] | 0.205 [0.144] |
| <i>RS *death post-HSAA*age gap mother-father</i> | 0.154 [0.052] | 0.046 [0.112] | 0.103 [0.249] |
| Observations | 458 | 458 | 641 |
| R-squared | 0.76 | 0.69 | 0.72 |

Notes: The sample consists of all ever-married generation II non-Hindu females in the reform and nonreform states. All regressions include state specific year of birth fixed effects and household fixed effects. All pairwise interactions are included but not shown. Robust standard errors in brackets are clustered by village * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent

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