

Inheritance law reform, empowerment, and human capital accumulation:

Second generation effects from India

Parental bequests of material wealth or human capital are a key way to transfer assets across generations that affects patterns of accumulation and overall development by affecting resource access (Becker and Tomes 1979; Stiglitz and Weiss 1981), individuals' wealth, and economic opportunities (Blinder 1973). While inheritance laws affect nature and overall size of inter-generational bequests (Ellul, Pagano and Panunzi 2010), in most contexts they will also affect gendered patterns of wealth. This is particularly relevant if traditional norms provide men with preferential access to key household resources through inheritance and if females attach higher values to family needs or children's welfare and thus devote more of the resources at their disposal to these (Behrman 1990; Strauss, Mwabu and Beegle 2000). In this case, the level of female wealth, including assets received via inheritance, is likely to affect future generations' human capital investment, social mobility (Davies 1982; De Nardi 2004; Kotlikoff and Summers 1980), occupational choice, and asset accumulation (Cowell 1998). In fact, the potentially far-reaching effect of legal provisions regarding divorce (Stevenson and Wolfers 2006) or access to political office (Chattopadhyay and Duflo 2004) on female empowerment in the long term is well documented in the literature.

Recognition of the potentially transformative role inheritance can play in terms of overcoming long-standing bias against females' resource access, some countries recently revised legislative provisions in this respect. But results have often been mixed. In Ghana, legal changes seems to have triggered compensatory action that in the end made intended beneficiaries worse off (La Ferrara and Milazzo 2012). In Rwanda, changes in inheritance legislation became effective on a

large scale only once they were combined with a systematic land registration program (Ali, Deininger and Goldstein 2014). In India, some states started to amend the Hindu Succession Act as early as 1987 to make women's inheritance rights equal to those enjoyed by men. This was subsequently adopted on a national scale in 2005. One study finds that, in early adopting states, women's likelihood of inheriting land increased and indicators of female empowerment such as girls' educational attainment and age at marriage improved (Deininger, Goyal and Nagarajan 2013). But others find that reforms may have led to compensatory behavior (Roy 2013) or, by making it more costly to raise girls relative to boys, even have reduced girls' survival ratios (Rosenblum 2012).

This paper builds on this literature by assessing not only direct but also second-generation effects from the reform. We compare nature and magnitude of first generation effects of inheritance reform to second-generation effects by mothers who directly benefited from the reforms treating their daughters differently than those who were unaffected. Such second generation effects are identified by comparing outcomes for females relative to their male siblings in the same household between households where the mother was or was not affected by reform. To do so, we use data for three generations of individuals in three Indian states one of which implemented inheritance reforms in 1994. Outcomes of interest include inputs to education, in particular time spent studying, parents' educational spending, primary completion, and health status. Size and significance of second-generation effects can be compared to first-generation impacts on young girls whose mother was unaffected. Beyond evidence in support of significant second-generation effects, we also find that the magnitude of such effects may well exceed that of first generation impacts.

To assess whether second-generation effects are plausible and to trace channels through which

they might materialize, we complement evidence on second-generation effects with exploration of HSAA- induced impacts on the parent generation. Although the identification strategy is less robust than that for second-generation impacts, we find that females who benefited from inheritance reform in this generation were more likely to complete primary education, received more assets at marriage, and were more empowered in terms of access to bank accounts and sanitary facilities. Their reproductive choices also differed markedly from those by women who had not benefited from reform, in terms of significantly higher survival rates for daughters, though we also find evidence of the HSAA resulting in a lower share of females born, possibly through sex-selective abortion. This supports the notion that early amendments of the HSAA affected long-term outcomes for women, including the next generation's welfare and that improving inheritance rights can be a sustainable way for female empowerment.

The paper is structured as follows. The next section reviews evidence of asset transfers across generations, legal provisions regarding inheritance in India including the Hindu Succession Act Amendment (HSAA), and discussing data. We then introduce issues of identification and present results for second-generation impacts of the HSAA using a triple difference for education and health outcomes. The subsequent section complements this with estimation of (first-generation) effects on generation II with regard to education completion, assets received at marriage, female empowerment, and reproductive choices using a less robust identification strategy. We finally conclude with implications for research and policy.

Background and motivation

Although inheritance of key assets including land is likely to be an important determinant of women's bargaining power, empirical studies to assess the direct or indirect impact of

inheritance reform are few and often weakly identified. Legal amendments to change female inheritance rights in India are an exogenous source of variation that has been used in a number of studies to assess first generation reform impacts. Extending such investigation to include second-generation effects is justified to assess whether, over and above direct effects in terms of resource transfers, inheritance reform can, possibly through its effect on empowerment, have a sustained impact beyond the immediate beneficiaries. To identify impacts of inheritance reforms on outcomes in terms of education and health, we use variation in whether or not the mother benefited from the HSAA and compare females to their male siblings in the same household controlling for direct resource transfers received by their mother. This is complemented with evidence on first-generation effects on education, assets received at marriage, access to a bank account as well as sanitary facilities, and reproductive choices.

The importance of women's inheritance

A unitary household model may not adequately describe reality if preferences are heterogeneous and the distribution of resources within the household will affect parties' bargaining power (Anderson and Eswaran 2009). Who in the household owns assets that generate key income streams or can claim access to such income will profoundly affect substantive outcomes including decisions on the use of household resources, fertility, and educational, health, and nutrition investments in future generations' welfare.

Women's bargaining power is particularly relevant for transfers of human and physical capital to the next generation if, as found in some studies, women devote higher proportions of income to family needs than men (Strauss, Mwabu and Beegle 2000). In this case, children benefit if their mothers control a larger share of family resources (Thomas 1990). Further support for this is

provided by studies showing that (i) greater female bargaining power helped reduce fertility and child mortality in India (Dyson and Moore 1983); (ii) receipt of pensions by females but not males affected girls' anthropometric status in South Africa (Duflo 2003); (iii) higher female incomes after agricultural reforms increased girls' survival rates in China (Qian 2008) and female empowerment affected contraceptive choice in Zambia (Ashraf, Field and Lee 2014); and (iv) exogenous increases in low-castes' female income significantly increased investment in schooling, particularly for girls (Luke and Munshi 2011).

The literature demonstrates long term effects from female education (Becker, Cinnirella and Woessmann 2013) and far-reaching economic impacts of regulations regarding inheritance on the level and nature of investment (Ellul, Pagano and Panunzi 2010). Yet, until recently, study of inheritance largely abstracted from the fact that recipients' gender may matter and the conceptual literature on inheritance abstracts from gender, focusing on other attributes instead. The wealth model (Becker and Tomes 1979) predicts altruistic parents to provide children of different ability with amounts of human capital to equate marginal returns to schooling to those from financial assets. The strategic bequest model (Bernheim, Shleifer and Summers 1985) assumes parents bequeath assets to children in return for support in old-age; tests in a developed country setting lend general support to an equal allocation rule (Behrman and Rosenzweig 2004).

While land is a key asset all over the world (Deininger 2003; Doss *et al.* 2012), many traditional societies restrict women's ability to independently own or inherit it (Platteau and Baland 2001). Gendered patterns of land inheritance thus have been identified as a key determinant of women's economic opportunities and their ability to cope with risks (Deere *et al.* 2013). While land inheritance is affected by a range of factors (Goetghebuer and Platteau 2010), it will impact social and economic outcomes (La Ferrara 2003). The value and nature of assets which a female

brought to a marriage is an important determinant of women's bargaining power in Ethiopia (Kumar and Quisumbing 2012) and Tanzania (Peterman 2011). For 15 countries in Sub-Saharan Africa, less than half of widows report inheriting land (Peterman 2012)¹ and widows' ability to hold on to their husband's land is highly unpredictable (Chapoto, Jayne and Mason 2011).

This, together with the fact that land conflicts, many due to inheritance, tend to disproportionately affect women (Deininger and Castagnini 2006), has led some to recommend the use of legal provisions to make women's inheritance rights more secure and in doing so reduce long-standing gender discrimination and improve outcomes (Cooper and Bird 2012). But as legal interventions often had limited impact (Anderson 2003) and property rights reforms proved difficult to sustain over time (Galiani 2011), evidence of tangible and sustained impact will be essential to make a case for such reforms. But empirically a key issue is that women's economic opportunities and their bargaining power are affected by a host of factors including relative endowments and production technology, so that identification will be difficult (Quisumbing 2001).

Exogenous changes in legal provisions that affect women's ability to control key family assets can help fill this void and advance understanding of intra-household bargaining. For example, changes of US divorce laws that made exit easier for women are analytically equivalent to an asset transfer (Chiappori, Fortin and Lacroix 2002) and raise similar analytical issues. Studies often use states' adoption of such provision at different points in time to achieve identification (Allen 1992; Friedberg 1998; Peters 1986; Wolfers 2006). Results suggest far-reaching impacts on spouses' bargaining power in existing marriages and outcome variables such as domestic violence (Stevenson and Wolfers 2006) and female labor force participation (Stevenson and Wolfers 2007).

Women's inheritance rights in India

Despite the Constitution mandating gender equality, inheritance in India was traditionally strongly biased against women. The 1956 Hindu Succession Act (HSA) distinguishes individual property from joint ancestral assets which include land (Agarwal 1994). The fact that rights to the latter are limited to a group -the coparcenary- that comprises only males severely limits females' ability to inherit joint property.² To eliminate the gender inequality inherent in this practice, a number of states amended this Act by passing substantively similar amendments -referred as Hindu Succession Act Amendments or HSAA- starting from 1987. This stipulated that coparceners' daughters will acquire coparcenary rights by birth,³ thereby making their status equal to that of sons. The exogenous change introduced by the HSAA thus allows us to explore whether efforts in inheritance legislation improved access to physical and human capital by women who were the intended beneficiaries from such legislation.

A number of studies indeed explored first-generation effects of the HSAA. Comparing males and females in the same household for those that did and did not benefit from the reform suggests that the HSAA markedly increased the likelihood of inheriting land for direct beneficiaries (Deininger, Goyal and Nagarajan 2013). Use of repeated cross sections suggests that the reforms may have given rise to compensatory behavior in the sense that they increased educational attainment but reduced the likelihood of girls inheriting land (Roy 2013).⁴ Yet, the finding that, for landowning households, inheritance reform reduced girls' survival ratios, possibly by making it more relatively costly to raise girls vs. boys (Rosenblum 2012) points towards potential unintended second-generation effects. While slow changes in social norms may be one reason for this, this suggests that second-generation effects deserve more in-depth analysis.

Data, sample composition, and descriptive statistics

To analyze effects of inheritance reform, we use data from a 2011 follow up to the 2007 Rural Economic and Demographic Survey (REDS) conducted by India's National Council for Applied Economic Research (NCAER) in Maharashtra, Uttar Pradesh and Orissa. The household survey collected information on three generations, the head and spouse at the time of the survey (generation II), their parents (generation I), and their children (generation III). The total sample comprises 1,204 households with 2,931 generation III descendants. Figure 1 plots the density distribution of birth years for the sample, pointing towards an average age of 79, 49, and 18 years for individuals in generations I, II, and III, when data were collected.

Beyond the information routinely collected in multi-purpose household surveys (e.g., year of birth and years of schooling), our survey includes data on time use during a typical day for all individuals in generations II and III. For those in generation II, we have information on the value of all assets (including land) brought into the marriage, access to an individual bank account, spending on education for each co-resident child, and the survival status or year of death of each parent. This is complemented with household-level data on the amount of resources spent for each child on education (books/stationery, transport/hostel and private coaching/tuition) and to cure preventable diseases as well as presence of a latrine, a variable we use as a proxy for attention to preventive rather than curative health. Moreover, the survey also includes the number of children born and still alive by gender for all generation II women below the age of 60, providing information on fertility (the number of children and the share of daughters born) as well as sons' and daughters' survival rates. For generation III individuals, including not co-resident ones, information on the extent of primary school completion is also available.

Descriptive statistics on characteristics of interest for generation II and III individuals by reform status are in table 1 (see appendix table 1 for values of the same variables by state). The HSAA applies to those whose father is still alive or died after 1994. We note that 62% of generation II males' fathers and 76% of generation II females' fathers passed away after 1994 or are still alive so that the HSAA would apply, providing sufficient variation to identify inheritance-induced effects. While the impact of the HSAA has to be estimated based on time variation with controls and fixed effects as needed, comparing between reform and non-reform states provides some illustration of the data.

On average, generation II males received more than six years of education, but generation II females lag behind their husbands by some three years. Amounts of gifts received at the time of marriage and controlled by individuals in the marriage (i.e., females' *stridhan*) were more for males than females on average (0.61 vs. 0.39). Females have higher levels of endowments with human capital (3.83 vs. 3.37) and physical assets (0.43 vs. 0.38) in Maharashtra than non-reform states, a pattern that is reversed for males, lending prima facie evidence support to the HSAA having been effective. If increases in endowment and impacts induced by the HSAA through channels including actual or potential inheritance translated into bargaining power within the household for females, our variables measuring intra-household bargaining power should capture some systematic differences between Maharashtra and non-reform states. Households in the reform state are more likely to have a latrine (by 36%), a good which has been shown to be strongly preferred by females.

As inheritance legislation is likely to affect reproductive choices, we use information on the number and the sex ratio of children by females in generation II by drawing on survey information regarding the pregnancy history for ever married women aged 15-60. At a

descriptive level doing so points towards significantly lower levels of fertility (2.78 vs. 3.46) but insignificant differences in survival rates or sex ratios and we will check this in a regression framework.

Second generation effects of inheritance reform: Approach and empirical evidence

This section presents the approach used to assess second-generation effects of the HSAA as well as evidence with respect to time allocation, educational spending, completion of primary education, and resources spent on curing preventable diseases, possibly due to insufficient preventive care, for generation III individuals.

Analytical approach

To identify second-generation effects of inheritance reform, we use a triple difference estimation strategy where the three relevant differences are (i) between generation III males and females within the same household (by individuals in generation II); (ii) between generation III individuals whose mothers' fathers died before 1994 and those who died after 1994 or are still alive; and (iii) between generation III individuals from the reform state (Maharashtra) and non-reform states of Orissa and Uttar Pradesh. The estimating equation is:

$$Y_{ij} = \alpha_j + \delta_1 F_{ij} + \delta_2 F_{ij} * MD_j + \delta_3 M_j * F_{ij} + \delta_4 M_j * F_{ij} * MD_j + \varphi_{ij} + \epsilon_{ij} \quad (1)$$

where Y_{ij} represents the outcome variable of interest (of individual i from household j) as discussed above,⁵ α_j is a household-level fixed effect that controls for any time-invariant characteristics of generation II households. F_{ij} and MD_j are indicator variables, respectively, for generation III females (compared to their male siblings), and whether their mothers' fathers died before or after 1994 which, in the reform state (but not elsewhere) would imply that mothers

either did not or did benefit from reforms, and δ_3 and δ_4 , the coefficients on their interactions with a reform dummy M_j are parameters of interest that capture first- and second-generation impacts of HSAA induced empowerment of generation II females, respectively,⁶ and φ_{ij} includes vectors of gender and state specific year of birth fixed effects and a vector of gender and state specific order of birth fixed effects to control for time-variant and order-variant aggregate effects or shocks by gender and state, respectively.

To explore robustness of our estimation and identify mechanisms that might underpin the impacts of the HSAA, we also report results from alternative specifications as follows: First, we test for parallel trends by comparing, for subsamples with sufficiently large sample sizes, generation III individuals whose maternal grandfathers died prior to the reform. In this case, MD_j also includes an indicator variable for whether mothers' fathers died in one to four years prior to the inheritance reform (between 1990 and 1993). Second, to address concerns about the reform state having historically been more gender progressive, we apply a difference in difference (DID) estimation strategy exclusively to the Maharashtra sample only. In this case the relevant differences are (i) between generation III males and females within the same (generation II) household; and (ii) between generation III individuals whose mothers' fathers died before 1994 and those who died after 1994 or are still alive. Third, we control for assets brought into the marriage and differences in education between the spouse and her husband, two measures of empowerment that have traditionally been used in the literature, to explore whether HSAA affected mothers through these or other channels. Finally, as wealthier parents may be more gender progressive in general, we control for household assets and the number of generation III individuals to capture potential direct and indirect wealth effects.

Evidence on time allocation and educational inputs

The samples to explore how the HSAA might have affected generation III girls' outcomes either directly or by empowering their (generation II) mothers, differ slightly from each other due to different age cut-offs. To test for HSAA-induced impacts on time allocation and education expenses, we use data from 791 generation III individuals from 6 to 14 years old in 449 generation II households (sample I). To examine school completion, information from 1,919 generation III individual 15 to 30 years old in 768 generation II households is used (sample II). Finally, to estimate the incidence of HSAA-induced health effects, measured as the need of treating diseases that could have been prevented with proper care, we use 927 generation III individuals 0 to 14 years old in 471 generation II households (sample III).

Results for time allocation in generation III are reported in table 2. We note that, compared to their male siblings, 6-14 years old girls in the reform state whose maternal grandfather is still alive or passed away after 1994 so that their mothers would be affected by the HSAA spent some 6% more time on study (col. 3) than those in households where mothers had been unaffected by the HSAA. With about 1.5 hour per day of additional time spent studying (including school attendance), this suggests a second-generation effect of non-negligible magnitude.⁷ While the reform indeed affected time allocation in generation III through other channels (col. 4), we note that in this case the point estimate of HSAA-effects increases to 14%. Results also suggest that increased time spent studying is almost entirely compensated for by a reduction of leisure (cols. 5 & 6). This suggests that the HSAA empowered mothers beyond the assets transferred to them, thus helping to increase the amount of education consumed by girls vs. boys, in line with recent emphasis on the far-reaching impacts of female empowerment (Diebolt and Perrin 2013). By comparison, with the possible exception of girls benefitting from the reform spending more on

leisure, estimated first-generation effects are uniformly weak. Although the smaller size increases the variance leading to insignificant estimates, the robustness check based on the Maharashtra sample suggests a second-generation effect on time on study for 11% (col. 4) and 3% (col. 3) with and without the control of other channels, respectively.

Results for total educational spending as well as spending on books and stationary, the main categories of such expenses, in table 3 point towards strongly positive second generation effects from reform. For overall spending, having a mother who benefited from the HSAA is estimated to triple spending on daughters' education through a female empowerment effect (col. 1). This is mainly contributed by the increase in the expense on books and stationary (col. 3). The estimates are quantitatively robust to inclusion of other covariates (cols. 2 and 4). Again although the smaller sample size increases the variance leading to insignificant estimates, the robustness check based on the Maharashtra sample also suggests a doubling spending on daughters' education, mainly contributed by the expense on books and stationary.

Impacts on school completion and health outcomes

Results for completion of primary education in table 4 point towards considerable bias (of 38%) against females compared to males in the same household for primary completion. Estimated second-generation effects (11%) suggest the HSAA helped to reduce bias against girls in primary education (col. 1). We test parallel trends as the relatively older generation III for school completion includes enough variations in terms of death of maternal grandfathers in the five years prior to the HSAA. While the second-generation effect is still significantly above 12% (col. 3), the estimated coefficient is small (3% only) and, for girls whose maternal grandfather died between 1990 and 1993, insignificant. Estimates from the Maharashtra sample point towards

negative direct effects, in line with the fact that the state has been more gender progressive, the estimated magnitude of the second-generation effect is comparable to what was found in the three-state sample although smaller sample size implies that estimate coefficients remain insignificant.

Although our data lack detailed information on health status, insufficient preventive care is likely to lead to greater incidence of otherwise preventable diseases that would in turn require higher levels of curative spending. Contrary to the finding of the inheritance reform having increased second-generation female mortality (Rosenblum 2013), and although sample sizes are quite small, results for the sample of individuals below age 6 in table 5 point towards indirect effects whereby mothers' exposure to the HSAA reduced the likelihood of their daughters requiring treatment for preventable diseases (col. 3). The estimated effect is robust to inclusion of other covariates (col. 4).

First generation effects of inheritance law reform for generation II

To explore if first-generation impacts could underpin the above indirect effects, we estimate how the HSAA affected outcomes by females in generation II measured by females' educational completion, share of assets brought into marriage, having an independent bank account, proper sanitation, and reproductive choices. Although lack of information on generation II siblings makes use of household fixed effects impossible, resulting in estimates that are less robust than those discussed above, evidence of significant first-generation effects associated with the HSAA supports the hypothesis of 'first-generation' effects on generation II underpinning the second-generation HSAA effects discussed earlier.

Analytical approach

For school completion, we use a DID estimation where the first difference is between ‘young’ and ‘old’ age groups, defined as those who should have completed relevant education decisions before or after the HSAA came into effect in 1994 and the second difference between states that did or did not change the HSA. With subscripts, i , j and k denoting individuals, households and villages, the DID estimation equation for school completion is:

$$Y_{ijk} = \alpha_k + \beta_1 G_{ijk} + \beta_2 M_k G_{ijk} + \epsilon_{ijk} \quad (2)$$

where Y_{ijk} is an indicator variable of whether or not the individual completed primary or secondary education, α_k is a village-level fixed effect controlling for time-invariant characteristics at this level,⁸ G_{ijk} is a dummy that equals one if the individual is in the ‘young’ cohort that should have been affected by the HSAA (those below 30 years old in 2011 for primary and those below 34 years old in 2011 for secondary implying that they were below 14 or 18 years of age in 1994, respectively)⁹, and M_k a reform state dummy. We estimate equation (2) for male and female samples separately and note that in the female sample β_2 denotes the estimated first-generation impact of the HSAA on educational completion. We test parallel trends by comparing generation II individuals who already completed primary or secondary school when the HSAA came into force. In this case, G_{ijk} also includes an indicator variables for those 31 to 40 years old in 2011 for primary and those aged 35 to 40 in 2011 for secondary. We do not report results for the Maharashtra sample because that will leave us a simple cohort comparison.

For other assets transferred at time of marriage, a triple difference strategy is used with differences between (i) reform and non- reform states; (ii) ‘young’ and ‘old’ cohorts whose date of marriage (after or before 1994) implies decisions on asset transfers were or were not informed

by the HSAA; and (iii) whether or not the father died before 1994 so that an inheritance had already been triggered.¹⁰ The estimation equation is

$$Y_{ijk} = \alpha_k + \beta_1 D_{ijk} + \beta_2 G_{ijk} + \beta_3 G_{ijk} * D_{ijk} + \beta_4 M_k * D_{ijk} + \beta_5 M_k * G_{ijk} + \beta_6 M_k * G_{ijk} * D_{ijk} + \lambda_{ijk} + \epsilon_{ijk} \quad (3)$$

where, in line with earlier notation, Y_{ijk} denotes the value of assets including land brought into the marriage, D_{ijk} is a dummy of whether the individuals' fathers died before 1994 so s/he would not have benefited from the reform even in the reform state, G_{ijk} is an indicator variable for the 'young' cohort (generation II individuals below age 48 in 2011 who were less than 30 years in 1994 so that their marriage decisions were affected by the reform),¹¹ λ_{ijk} is a vector of state specific year of birth fixed effects to control for time-varying shocks or aggregate effects by state and other variables are defined as in equation (1). Equation (3) is estimated separately for female and male samples; for the female case, β_6 is the estimate of the direct first-generation impact of the HSAA on assets brought into the marriage. To show validity of our estimation, we report the comparison between fathers died in one to four years prior to the inheritance reform (between 1990 and 1993) and those died earlier (before 1990), and the results from a DID estimation for the Maharashtra sample.

A similar strategy can be used for empowerment and reproductive choices. The only difference from equation (3) is that we do not have the comparison between cohorts. We apply a DID estimation with differences between (i) reform and non- reform states; and (ii) whether or not the father died before 1994 so that an inheritance had already been triggered. Since the basic specification is a DID, we do not report results for the Maharashtra sample. In addition to the pre-trend test (fathers died between 1990 and 1993 vs. fathers died before 1990), we also explore

mechanisms of empowerment as well as the wealth effect in terms of increasing household assets in line with the specifications for generation III discussed above.

Empirical results

Results for primary and secondary school completion by generation II females (cols. 1 and 2) and males (cols. 3 and 4) in table 6 point towards significant and quantitatively large effects on primary completion. The estimated HSAA-induced increase in the likelihood of primary completion by females is 14% (col. 1). Interacting the reform dummy with the age group just above the cut-off points towards a negative trend for individuals born a decade earlier who did not benefit from the reform (col. 2). While point estimates of the relevant secondary education are positive for females, compared to being sometimes negative for males, neither of the point estimates is significant at conventional levels.

For assets brought into the marriage (equation 3), table 7 presents results for females and males in cols. 1-2 and 3-4, respectively. Estimates point towards a HSAA-induced increase in the level of assets brought into the marriage by females of about 65% (col. 1), compared to an insignificant and negative change in the amount of assets contributed by husbands (col. 3). The parallel trend test suggests that females whose fathers died one to five years earlier than the HSAA did not enjoy such a high level of assets (col. 2), supporting that the effect was induced by the reform itself. Estimates based on the Maharashtra sample are insignificant and quantitatively smaller, but still with a magnitude of 30% to 40%. To the extent that the share of assets brought into the marriage will affect individuals' future bargaining power, this would be consistent with the notion that the HSAA empowered direct female beneficiaries, thus increasing the plausibility of downstream second-generation effects.

Results for the likelihood of females having a bank account or the household having a sanitary latrine in table 8 suggest that the HSAA increased the likelihood of females having an individual bank account by 5% (col. 1), which is robust to inclusion of other covariates (col. 2). Households where the female spouses had benefited from the HSAA were also by 12% more likely to have sanitary latrines (cols. 4 and 5), a good that is strongly preferred by women (Stopnitzky 2014). The tendency was to some extent reinforced by positive education gaps between mother and father (2%). This is consistent with an intra-household externality whereby lack of authority may preclude women's preferences from translating into action similar to what was found elsewhere for cook-stoves (Miller and Mobarak 2013), suggesting that external forces that empower women may help translate preferences into action. The pre-trend test supports our estimate for the case of having sanitary latrines (col. 6) though less so for having an individual bank account where there is an insignificant trend with the same magnitude as the reform effect (col. 3).

It has been suggested that, even if it improves outcomes for girls who are alive, the HSAA may affect reproductive choices and female mortality. To test for such effects, regressions on the number of children and the share born to 717 female spouses aged 15-60 in our sample as well as their sons' and daughters' survival rates are illustrated in table 9. Results point towards a reduction in the share of daughters born by 13% (col. 4 of panel A), possibly a result of sex-selective abortion. At the same time, we note a significant increase in girls' survival rate by 10% (col. 1 of panel B) whereas boys' survival rates remain essentially unchanged (col. 4 of panel B). These estimates are robust to inclusion of other covariates and controlling for pre-trends. The finding is quite different from increased female mortality (Rosenblum 2013), though in line with a model whereby parents invest in children mainly for old age security which, in the context of South Asia is provided by boys but not girls, so that greater female

autonomy may lead to reduced fertility and higher survival rates for girls but also sex-selective abortion (Eswaran 2002).

Conclusion and policy implications

We add to the literature on the impact of inheritance reform by comparing magnitude and significance of first- and second-generation effects of such a measure. The latter accrue to direct beneficiaries' off-spring, possibly via increased intra-household bargaining power by women who directly benefited from reforms. Results point towards significant second-generation effects that are often larger in magnitude than first- generation effects on female educational spending and attainment, and health status. Evidence of first-generation effects of inheritance reform on female empowerment in the parent generation via school completion, assets received at marriage, females' access to own bank accounts and sanitary facilities, and fertility decisions support the plausibility of such effects. While the share of daughters born to females who benefited from reforms appears to have decreased, survival rates by daughters increased as a result of inheritance reform. Beyond the first-generation impact on the amount of resources transferred to women at the point of (intestate) inheritance, the reform of the inheritance regime thus affected future generations' welfare through a number of other empowerment-related channels.

Evidence on long-term effects of inheritance law reform beyond the immediate beneficiaries is relevant for India and beyond. At a global level, understanding of longer-term impacts of such a measure will help appreciate potential and limitations of inheritance reform, compared to other measures and policies, as a means to promote gender equity. For India, an ability to more precisely gauge HSAA-induced benefits will affect the social desirability of measures to more actively disseminate this piece of legislation or support and monitor its implementation. While

assessing the extent to which the results found here carry over to other settings including in North Indian states would be of interest, they do suggest that, as key determinants of intergenerational resource transmission, the norms and legislative provision governing inheritance offer considerable potential to promote sustained female empowerment.

¹ These countries are Benin, Congo/Brazzaville, Democratic Republic of Congo, Guinea, Mali, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Tanzania, Uganda, Zambia, and Zimbabwe.

² Our focus on intestate inheritance is justified by the fact that rural Indians lack both the knowledge and the resources to have a will registered.

³ The Act was amended in 1986 in Andhra Pradesh in 1989 in Tamil Nadu, and in 1994 in Maharashtra and Karnataka. Kerala had abolished the joint family property system in 1976 (Agarwal 1994).

⁴ Education results may partly be due to potential state- and gender-specific trends independent of the inheritance reform and results on inheritance and dowry may be driven by the fact that at the time when data were collected girls in the sample exposed to the reform were still relatively young (15 years in KA and MA; 20 years in TN, 23 years in AP, and 33 years in KE) when data were collected in 1999 and that women who had inherited land may no longer live with their parents.

⁵ For school completion, we focus on generation III individuals 15-30 years old who were less than 14 years old in 1994 for primary education.

⁶ Note that fathers of generation III individuals, i.e., generation II males were all alive at the time of the survey, so we expect generation III females directly benefit from the reform as generation II females whose fathers died after 1994 or were still alive at the time of the survey.

⁷ With a sample mean of 28% for the variable (time spent studying), this represents an economically very meaningful increase of more than 20%.

⁸ Note that we cannot include household fixed effects in this regression as males and females are from different households and match endogenously in the marriage market. See the discussion on this below.

⁹ Note that all the individuals in generation II in our sample are older than 20 years old and already completed the secondary school. We restrict the sample to include generation II individuals 45 years old and younger to exclude those who are too old to be comparable with the ‘young’ group.

¹⁰ The young cohort for school completion is younger than those for assets brought into marriage. People completed primary and secondary schools at about 14 and 18, respectively, and education decisions are relevant before that ages. However, people normally got married at some 20 when marriage decisions including the gift transfer are made. Not surprisingly, there is no difference in the timing of father’s death for the young cohort (all of them had a father alive in 1994) so to maintain comparability and consider only individuals who would have unambiguously benefited from the HSAA, we also exclude individuals whose fathers died before 1994 from the old cohort.

¹¹ We do not know the year of marriage for generation II individuals, so we use age for proxy supposing people got married before 30. Note that we lose variations in terms of the timing of father’s death when we focus on younger samples.

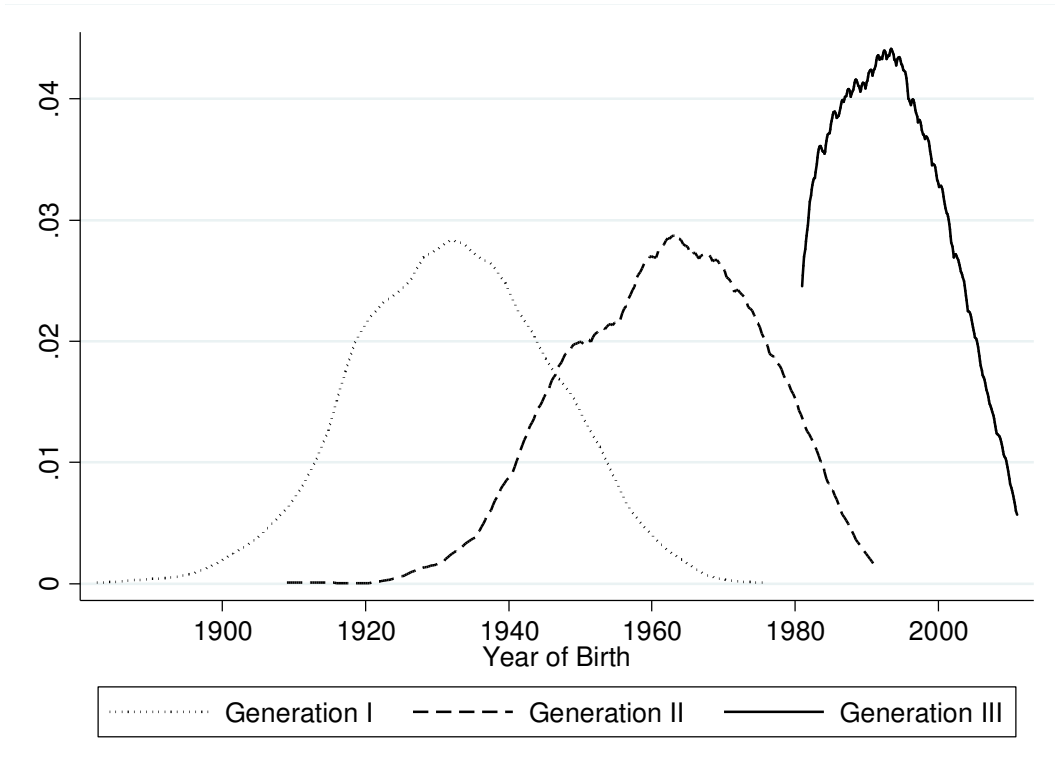


Figure 1. Age distribution of three generations

Table 1. Descriptive statistics on relevant outcomes in different samples

| | Male | | | Female | | |
|--|--------|---------|------------|--------|--------|------------|
| | Total | Reform | Non reform | Total | Reform | Non reform |
| Generation II | | | | | | |
| Year of birth | 1960 | 1959 | 1960 | 1964 | 1964 | 1964 |
| Father died after 1994 or alive | 0.62 | 0.62 | 0.62 | 0.76 | 0.77 | 0.76 |
| <i>Individual characteristics</i> | | | | | | |
| Years of schooling | 6.63 | 5.90 | 7.02*** | 3.53 | 3.83 | 3.37* |
| Education gap with spouse | 3.11 | 2.07 | 3.66*** | -3.11 | -2.07 | -3.66*** |
| Share of gifts received at marriage | 0.61 | 0.57 | 0.62** | 0.39 | 0.43 | 0.38** |
| Have an individual bank account | | | | 0.25 | 0.26 | 0.25 |
| Having a sanitary latrine (household level) | | | | 0.44 | 0.65 | 0.29*** |
| <i>Reproductive behavior</i> | | | | | | |
| Number of children born | | | | 3.18 | 2.78 | 3.46*** |
| Share of daughters born | | | | 0.44 | 0.45 | 0.44 |
| Survival rate of daughters | | | | 0.97 | 0.97 | 0.96 |
| Survival rate of sons | | | | 0.95 | 0.97 | 0.95 |
| No. of observations | 1,204 | 418 | 786 | 1,204 | 418 | 786 |
| Generation III | | | | | | |
| Year of birth | 1993 | 1993 | 1994** | 1993 | 1993 | 1993 |
| Years of schooling | 7.56 | 7.92 | 7.41* | 6.53 | 6.76 | 6.44 |
| No. of observations | 1,529 | 430 | 1,099 | 1,402 | 395 | 1,007 |
| Sample I (6-14) | | | | | | |
| % of the total sample | 26.95 | 23.49 | 28.30 | 27.03 | 25.57 | 27.61 |
| Currently enrolled | 0.91 | 0.91 | 0.91 | 0.90 | 0.87 | 0.91 |
| Expenses on education (Rs) | 967.05 | 1157.85 | 906.73 | 771.73 | 936.75 | 714.90* |
| of which on books/stationery | 0.87 | 0.79 | 0.89*** | 0.89 | 0.87 | 0.90 |
| of which on transport/hostel | 0.07 | 0.19 | 0.04*** | 0.07 | 0.13 | 0.05*** |
| of which on private coaching/tuition | 0.06 | 0.01 | 0.07** | 0.04 | 0.00 | 0.06** |
| Share of time on productive work & housework | 0.08 | 0.07 | 0.08* | 0.10 | 0.09 | 0.10 |
| Share of time on study | 0.28 | 0.29 | 0.27 | 0.28 | 0.29 | 0.28 |

| | | | | | | |
|---|-------|-------|-------|-------|-------|---------|
| Share of time on leisure | 0.64 | 0.64 | 0.64 | 0.62 | 0.62 | 0.62 |
| Sample II (15-30) | | | | | | |
| % of the total sample | 65.53 | 70.23 | 63.69 | 65.41 | 66.58 | 64.95 |
| Completed primary education | 0.72 | 0.75 | 0.71 | 0.56 | 0.65 | 0.52*** |
| Sample III (0-14) | | | | | | |
| % of the total sample | 31.65 | 28.37 | 32.94 | 31.60 | 32.41 | 31.28 |
| Treatment for preventable diseases | 0.54 | 0.51 | 0.54 | 0.58 | 0.58 | 0.58 |
| Treatment for preventable diseases for age 0-6 | 0.60 | 0.56 | 0.62 | 0.67 | 0.65 | 0.68 |
| Treatment for preventable diseases for age 7-14 | 0.50 | 0.49 | 0.51 | 0.54 | 0.55 | 0.54 |

Source: Own computation from 2011 REDS follow-up survey.

Table 2. Determinants of time allocation by school-age children in generation III

| | Productive work & housework | | Education & study | | Leisure | |
|--|--------------------------------|-------------------|---------------------|---------------------|----------------------|----------------------|
| | % total time | | % total time | | % total time | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Panel A: Three States | | | | | | |
| Female | -0.007 (0.014) | -0.015 (0.024) | 0.006 (0.013) | 0.007 (0.043) | 0.001 (0.001) | 0.007 (0.019) |
| Female*Mother's father died after 1994/alive | 0.016 (0.015) | 0.018 (0.026) | -0.031 (0.014) | -0.035 (0.032) | 0.015*** (0.001) | 0.017 (0.006) |
| Female*Education gap mother-father | | -0.002 (0.002) | | 0.004 (0.006) | | -0.002 (0.004) |
| Female*Share of mother's gifts at marriage | | -0.015 (0.032) | | 0.005 (0.077) | | 0.009 (0.045) |
| Female*Number of generation III in the household | | -0.001 (0.004) | | -0.004 (0.002) | | 0.004 (0.005) |
| Female*ln(household assets) | | -0.003 (0.002) | | -0.005 (0.012) | | 0.008 (0.010) |
| Reform*Female | 0.034 (0.014) | 0.011 (0.024) | -0.089** (0.013) | -0.171* (0.043) | 0.055*** (0.001) | 0.160** (0.019) |
| Reform*Female*Mother's father died after 1994/alive | 0.026 (0.015) | 0.042 (0.026) | 0.064** (0.014) | 0.141** (0.032) | -0.091*** (0.001) | -0.183*** (0.006) |
| Reform*Female*Education gap mother-father | | 0.005 (0.002) | | 0.001 (0.006) | | -0.006 (0.004) |
| Reform*Female*Share of mother's gifts at marriage | | -0.008 (0.032) | | -0.050 (0.077) | | 0.058 (0.045) |
| Reform*Female*Number of generation III in the household | | 0.012* (0.004) | | 0.052*** (0.002) | | -0.064*** (0.005) |
| Reform*Female*ln(hh assets) | | 0.005 (0.002) | | 0.012 (0.012) | | -0.017 (0.010) |
| Observations | 668 | 668 | 668 | 668 | 668 | 668 |

| | | | | | | |
|-----------|-------|-------|-------|-------|-------|-------|
| R-squared | 0.903 | 0.904 | 0.857 | 0.864 | 0.856 | 0.863 |
|-----------|-------|-------|-------|-------|-------|-------|

Panel B: Maharashtra only

| | | | | | | |
|--|---------|---------|---------|---------|---------|---------|
| Reform*Female | 0.027 | -0.003 | -0.083 | -0.164 | 0.056 | 0.167 |
| | (0.087) | (0.106) | (0.112) | (0.145) | (0.105) | (0.167) |
| Reform*Female*Mother's father died after 1994/alive | 0.042 | 0.061 | 0.033 | 0.106 | -0.076 | -0.166 |
| | (0.042) | (0.065) | (0.040) | (0.090) | (0.057) | (0.115) |
| Reform*Female*Education gap mother-father | | 0.003 | | 0.004 | | -0.007 |
| | | (0.006) | | (0.011) | | (0.015) |
| Reform*Female*Share of mother's gifts at marriage | | -0.022 | | -0.045 | | 0.067 |
| | | (0.066) | | (0.151) | | (0.163) |
| Reform*Female*Number of generation III in the household | | 0.011 | | 0.049 | | -0.060 |
| | | (0.022) | | (0.035) | | (0.043) |
| Reform*Female*ln(hh assets) | | 0.002 | | 0.006 | | -0.008 |
| | | (0.006) | | (0.009) | | (0.013) |
| Observations | 198 | 198 | 198 | 198 | 198 | 198 |
| R-squared | 0.870 | 0.874 | 0.824 | 0.834 | 0.811 | 0.826 |

Note: All regressions include gender and state specific year of birth fixed effects, gender and state specific order of birth fixed effects, and household fixed effects. Robust standard errors in brackets are clustered by state. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 3. Determinants of educational expenses for generation III

| | Total | | Books & stationary | |
|------------------------------------|--------------|------------|-------------------------------|------------|
| | Rs. | | Rs. | |
| | (1) | (2) | (3) | (4) |
| Panel A: Three States | | | | |
| Female | 1.354** | 1.408** | 2.330** | 2.326** |
| | (0.148) | (0.159) | (0.426) | (0.305) |
| Female*Mother's father died | -0.273 | -0.270 | -0.284 | -0.259 |
| after 1994/alive | (0.171) | (0.329) | (0.495) | (0.425) |
| Female*Education gap | | 0.019** | | 0.002 |
| mother-father | | (0.002) | | (0.002) |
| Female*Share of mother's | | -0.021 | | -0.232 |
| gifts at marriage | | (0.355) | | (0.467) |
| Female*Number of | | 0.092 | | 0.037 |
| generation III in the household | | (0.180) | | (0.278) |
| Female*ln(household assets) | | -0.001 | | -0.040 |
| | | (0.015) | | (0.031) |
| Reform*Female | -2.897*** | -2.548*** | -3.490** | -2.914** |
| | (0.148) | (0.159) | (0.426) | (0.305) |
| Reform*Female*Mother's father died | 2.621*** | 2.196** | 2.321** | 1.698* |
| after 1994/alive | (0.171) | (0.329) | (0.495) | (0.425) |
| Reform*Female*Education gap | | -0.059*** | | -0.049*** |
| mother-father | | (0.002) | | (0.002) |
| Reform*Female*Share of mother's | | -0.501 | | -0.378 |
| gifts at marriage | | (0.355) | | (0.467) |
| Reform*Female*Number of | | -0.083 | | -0.148 |
| generation III in the household | | (0.180) | | (0.278) |
| Reform*Female*ln(household assets) | | -0.062* | | 0.004 |
| | | (0.015) | | (0.031) |
| Observations | 682 | 682 | 682 | 682 |
| R-squared | 0.913 | 0.914 | 0.894 | 0.895 |

Panel B: Maharashtra only

| | | | | |
|--|---------|---------|---------|---------|
| Reform*Female | -1.544 | -1.140 | -1.159 | -0.588 |
| | (4.831) | (5.123) | (3.790) | (4.092) |
| Reform*Female*Mother's father died after 1994/alive | 2.347 | 1.926 | 2.036 | 1.438 |
| | (3.990) | (4.593) | (3.014) | (3.566) |
| Reform*Female*Education gap mother-father | | -0.039 | | -0.047 |
| | | (0.121) | | (0.117) |
| Reform*Female*Share of mother's gifts at marriage | | -0.522 | | -0.610 |
| | | (1.205) | | (1.012) |
| Reform*Female*Number of generation III in the household | | 0.008 | | -0.111 |
| | | (0.811) | | (0.653) |
| Reform*Female*ln(household assets) | | -0.062 | | -0.036 |
| | | (0.154) | | (0.132) |
| Observations | 169 | 169 | 169 | 169 |
| R-squared | 0.824 | 0.825 | 0.861 | 0.863 |

Note: Total expenses on education include expenses on books/stationery, transport/hostel and private coaching/tuition. All regressions include gender and state specific year of birth fixed effects, gender and state specific order of birth fixed effects, and household fixed effects. Robust standard errors in brackets are clustered by state. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 4. Determinants of generation III's rates of primary completion

| | (1) | (2) | (3) |
|--|----------------------|----------------------|----------------------|
| Panel A: Three States | | | |
| Female | -0.379*** (0.011) | -0.382*** (0.008) | -0.379*** (0.030) |
| Female*Mother's father died after 1994/alive | 0.015 (0.019) | 0.020 (0.045) | 0.015 (0.040) |
| Female*Mother's father died In 1990-1993 | | | -0.001 (0.057) |
| Female*Education gap mother-father | | -0.004** (0.001) | |
| Female*Share of mother's gifts at marriage | | -0.085 (0.124) | |
| Female*Number of generation III in the household | | -0.008 (0.027) | |
| Female*ln(household assets) | | 0.007 (0.012) | |
| Reform*Female | 0.036* (0.011) | 0.074** (0.008) | 0.024 (0.030) |
| Reform*Female*Mother's father died after 1994/alive | 0.110** (0.019) | 0.083 (0.045) | 0.123* (0.040) |
| Reform*Female*Mother's father died In 1990-1993 | | | 0.033 (0.057) |
| Reform*Female*Education gap mother-father | | 0.015*** (0.001) | |
| Reform*Female*Share of mother's gifts at marriage | | 0.165 (0.124) | |
| Reform*Female*Number of generation III in the household | | -0.032 (0.027) | |
| Reform*Female*ln(household assets) | | -0.002 (0.012) | |

| | | | |
|--------------|-------|-------|-------|
| Observations | 1,919 | 1,919 | 1,919 |
| R-squared | 0.750 | 0.752 | 0.750 |

Panel B: Maharashtra only

| | | | |
|--|---------|---------|---------|
| Reform*Female | -0.343* | -0.308 | -0.354* |
| | (0.190) | (0.197) | (0.203) |
| Reform*Female*Mother's father died after 1994/alive | 0.125 | 0.103 | 0.138 |
| | (0.098) | (0.099) | (0.119) |
| Reform*Female*Mother's father died In 1990-1993 | | | 0.033 |
| | | | (0.170) |
| Reform*Female*Education gap mother-father | | 0.011 | |
| | | (0.011) | |
| Reform*Female*Share of mother's gifts at marriage | | 0.079 | |
| | | (0.119) | |
| Reform*Female*Number of generation III in the household | | -0.040 | |
| | | (0.039) | |
| Reform*Female*ln(household assets) | | 0.005 | |
| | | (0.012) | |
| Observations | 565 | 565 | 565 |
| R-squared | 0.782 | 0.785 | 0.782 |

Note: As explained in the text, the sample comprises generation III individuals 15-30 years old in 2011 (<14 years in 1994) for primary education. All regressions include gender and state specific year of birth fixed effects, gender and state specific order of birth fixed effects, and household fixed effects. Robust standard errors in brackets are clustered by state. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5. Determinants of treatment for preventable diseases in generation III

| | 6-14 years | | <= 6 years | |
|--|----------------------|----------------------|----------------------|----------------------|
| | (1) | (2) | (3) | (4) |
| Panel A: Three States | | | | |
| Female | 0.352** (0.038) | 0.330** (0.058) | 0.256*** (0.000) | -2.042*** (0.160) |
| Female*Mother's father died after 1994/alive | -0.059 (0.164) | -0.088 (0.203) | 0.504*** (0.000) | 3.873*** (0.276) |
| Female*Education gap mother-father | | 0.015*** (0.000) | | -0.160*** (0.012) |
| Female*Share of mother's gifts at marriage | | -0.018 (0.144) | | 2.024*** (0.147) |
| Female*Number of generation III in the household | | -0.019 (0.050) | | 0.438** (0.056) |
| Female*ln(household assets) | | -0.003 (0.070) | | -0.103** (0.013) |
| Reform*Female | -1.373*** (0.038) | -2.070*** (0.058) | 2.410*** (0.000) | |
| Reform*Female*Mother's father died after 1994/alive | -0.181 (0.164) | 0.129 (0.203) | -2.837*** (0.000) | -3.106*** (0.196) |
| Reform*Female*Education gap mother-father | | 0.006*** (0.000) | | 0.040* (0.012) |
| Reform*Female*Share of mother's gifts at marriage | | 0.541* (0.144) | | -2.406*** (0.147) |
| Reform*Female*Number of generation III in the household | | 0.007 (0.050) | | -0.402** (0.056) |
| Reform*Female*ln(household assets) | | -0.008 (0.070) | | 0.250*** (0.013) |
| Observations | 927 | 927 | 275 | 275 |
| R-squared | 0.740 | 0.745 | 0.914 | 0.948 |

Panel B: Maharashtra only

| | | | | |
|---------------------------------|---------|---------|---------|---------|
| Female | -1.020 | -1.739* | -0.000 | |
| | (0.917) | (1.010) | (1.661) | |
| Female*Mother's father died | -0.240 | 0.041 | -1.000 | -0.254 |
| after 1994/alive | (0.309) | (0.345) | (1.162) | (2.137) |
| Female*Education gap | | 0.021 | | -0.120 |
| mother-father | | (0.032) | | (0.122) |
| Female*Share of mother's | | 0.523 | | -0.382 |
| gifts at marriage | | (0.346) | | (1.730) |
| Female*Number of | | -0.013 | | 0.036 |
| generation III in the household | | (0.124) | | (0.257) |
| Female*ln(household assets) | | -0.011 | | 0.147 |
| | | (0.048) | | (0.418) |
| Observations | 250 | 250 | 76 | 76 |
| R-squared | 0.811 | 0.823 | 0.963 | 0.980 |

Note: All regressions include gender and state specific year of birth fixed effects, gender and state specific order of birth fixed effects, and household fixed effects. Robust standard errors in brackets are clustered by state. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 6. Determinants of education completion of generation II

| | Female | | Male | |
|---------------------------------------|---------------------|----------------------|-------------------|-------------------|
| | (1) | (2) | (3) | (4) |
| Primary | | | | |
| Young (<=30 years) | 0.081*** (0.006) | 0.180*** (0.005) | -0.079 (0.220) | -0.092 (0.159) |
| Young trend test (31-40 years) | | 0.155*** (0.005) | | 0.352 (0.159) |
| Reform*Young (<=30 years) | 0.137*** (0.006) | 0.077*** (0.005) | 0.175 (0.220) | -0.021 (0.100) |
| Reform*Young trend test (31-40 years) | | -0.098*** (0.005) | | 0.244 (0.100) |
| Observations | 527 | 527 | 391 | 391 |
| R-squared | 0.216 | 0.227 | 0.269 | 0.281 |
| Secondary | | | | |
| Young (<=34 years) | 0.095 (0.056) | 0.146 (0.078) | 0.095 (0.061) | 0.078 (0.038) |
| Young trend test (35-40 years) | | 0.097 (0.042) | | 0.121* (0.038) |
| Reform*Young (<=34 years) | 0.050 (0.056) | 0.028 (0.078) | 0.034 (0.061) | -0.029 (0.038) |
| Reform*Young trend test (35-40 years) | | -0.048 (0.042) | | 0.147* (0.038) |
| Observations | 527 | 527 | 391 | 391 |
| R-squared | 0.165 | 0.175 | 0.244 | 0.248 |

Note: All regressions include village fixed effects. Figures in brackets are robust standard errors clustered by state. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 7. Determinants of assets received at the time of marriage by generation II

| | Marriage at less than 30 | | | |
|---|--------------------------|----------------------|---------------------|--------------------|
| | Female | | Male | |
| | (1) | (2) | (3) | (4) |
| Panel A: Three States | | | | |
| Father died after 1994/alive | 0.191 (0.131) | 0.290 (0.170) | -0.065 (0.085) | 0.141 (0.155) |
| Father died in 1990-1993 | | 0.303** (0.055) | | 0.623 (0.340) |
| Young | 0.136 (0.181) | 0.016 (0.368) | 2.351** (0.459) | 2.369** (0.319) |
| Young*Father died after 1994/alive | -0.352** (0.050) | -0.356 (0.187) | -0.071 (0.469) | -0.266 (0.246) |
| Young*Father died in 1990-1993 | | -0.064 (0.390) | | -0.636 (0.656) |
| Reform*Father died after 1994/alive | -0.069 (0.131) | -0.261 (0.170) | 0.968*** (0.085) | 0.628* (0.155) |
| Reform*Father died in 1990-1993 | | -0.652*** (0.055) | | -1.261* (0.340) |
| Reform*Young | 0.776* (0.181) | 0.776 (0.368) | 1.453* (0.459) | 0.838 (0.319) |
| Reform*Young*Father died after 1994/alive | 0.652*** (0.050) | 0.765* (0.187) | -0.702 (0.469) | 0.135 (0.246) |
| Reform*Young*Father died in 1990-1993 | | 0.447 (0.390) | | 2.220* (0.656) |
| Observations | 1,204 | 1,204 | 1,204 | 1,204 |
| R-squared | 0.459 | 0.460 | 0.414 | 0.416 |
| Panel B: Maharashtra only | | | | |
| Reform*Father died after 1994/alive | 0.122 (0.317) | 0.029 (0.344) | 0.903** (0.451) | 0.769 (0.482) |
| Reform*Father died in 1990-1993 | | -0.349 | | -0.637 |

| | | | | |
|---|----------|----------|----------|---------|
| | | (0.727) | | (0.842) |
| Reform*Young | 5.683*** | 5.352*** | 4.257*** | 3.926** |
| | (0.749) | (1.115) | (1.558) | (1.760) |
| Reform*Young*Father died after 1994/alive | 0.300 | 0.409 | -0.772 | -0.131 |
| | (0.485) | (0.689) | (0.969) | (1.312) |
| Reform*Young*Father died in 1990-1993 | | 0.383 | | 1.584 |
| | | (0.980) | | (1.804) |
| Observations | 418 | 418 | 418 | 418 |
| R-squared | 0.426 | 0.427 | 0.362 | 0.364 |

Note: All regressions include state specific year of birth fixed effects and village fixed effects. Figures in brackets are robust standard errors clustered by state. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 8. Determinants of female empowerment in generation II

| | Female spouse has a bank account | | | Household has sanitary latrine | | |
|---------------------------------|----------------------------------|-----------|---------|--------------------------------|-----------|---------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Female spouse's father died | -0.015* | -0.016*** | 0.000 | -0.067 | -0.062 | -0.076* |
| after 1994/alive | (0.004) | (0.002) | (0.015) | (0.041) | (0.048) | (0.026) |
| Female spouse's father died | | | 0.043 | | | -0.023 |
| in 1990-1993 | | | (0.048) | | | (0.037) |
| Education gap female-male | | -0.001 | | | -0.011*** | |
| | | (0.008) | | | (0.001) | |
| Share of female spouse's gifts | | 0.053 | | | -0.011 | |
| at marriage | | (0.041) | | | (0.094) | |
| Ln (household assets) | | 0.002 | | | 0.029* | |
| | | (0.001) | | | (0.009) | |
| Reform*Female spouse's | 0.046*** | 0.044*** | 0.073** | 0.125* | 0.124 | 0.131** |
| father died after 1994/alive | (0.004) | (0.002) | (0.015) | (0.041) | (0.048) | (0.026) |
| Reform*Female spouse's father | | | 0.077 | | | 0.012 |
| died in 1990-1993 | | | (0.048) | | | (0.037) |
| Reform*Education gap female | | 0.006 | | | 0.016*** | |
| -male | | (0.008) | | | (0.001) | |
| Reform*Share of female spouse's | | -0.071 | | | -0.040 | |
| gifts at marriage | | (0.041) | | | (0.094) | |
| Reform*Ln (household assets) | | -0.014** | | | -0.010 | |
| | | (0.001) | | | (0.009) | |
| Observations | 1,197 | 1,197 | 1,197 | 1,055 | 1,055 | 1,055 |
| R-squared | 0.415 | 0.417 | 0.416 | 0.605 | 0.616 | 0.605 |

Note: All regressions include village fixed effects as well gender and state specific year of birth fixed effects. Figures in brackets are robust standard errors clustered by state. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 9. Determinants of generation II's reproductive choices

| Panel A | | | | | | |
|------------------------------|--------------------------------|------------|------------|--------------------------------|------------|------------|
| | Number of children born | | | Share of daughters born | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Female spouse's father died | 0.223*** | 0.155 | 0.602 | 0.015 | 0.005 | 0.092 |
| after 1994/alive | (0.016) | (0.072) | (0.314) | (0.027) | (0.032) | (0.065) |
| Female spouse's father died | | | 0.833 | | | 0.169 |
| in 1990-1993 | | | (0.609) | | | (0.092) |
| Education gap female-male | | 0.051 | | | 0.007 | |
| | | (0.049) | | | (0.006) | |
| Share of female spouse's | | -0.401 | | | -0.055 | |
| gifts at marriage | | (0.380) | | | (0.081) | |
| Ln (household assets) | | -0.131*** | | | -0.004* | |
| | | (0.005) | | | (0.001) | |
| Reform*Female spouse's | -0.279*** | -0.212* | -0.663 | -0.130** | -0.119* | -0.243* |
| father died after 1994/alive | (0.016) | (0.072) | (0.314) | (0.027) | (0.032) | (0.065) |
| Reform*Female spouse's | | | -0.843 | | | -0.262 |
| father died in 1990-1993 | | | (0.609) | | | (0.092) |
| Reform*Education gap | | -0.046 | | | 0.002 | |
| female-male | | (0.049) | | | (0.006) | |
| Reform*Share of female | | 0.200 | | | 0.028 | |
| spouse's gifts at marriage | | (0.380) | | | (0.081) | |
| Reform*Ln (household | | 0.137*** | | | 0.006** | |
| assets) | | (0.005) | | | (0.001) | |
| Observations | 717 | 717 | 717 | 717 | 717 | 717 |
| R-squared | 0.579 | 0.598 | 0.583 | 0.467 | 0.473 | 0.472 |

| Panel B | | | | | | |
|-----------------------------|---------------------------------|------------|------------|----------------------------|------------|------------|
| | Daughters' survival rate | | | Boys' survival rate | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Female spouse's father died | -0.055*** | -0.061*** | -0.015 | -0.018 | -0.014 | 0.011 |
| after 1994/alive | (0.005) | (0.004) | (0.016) | (0.007) | (0.006) | (0.025) |

| | | | | | | |
|--|---------------------|---------------------|-------------------|------------------|------------------|--------------------|
| Female spouse's father died in 1990-1993 | | | 0.073 (0.041) | | | 0.068 (0.031) |
| Education gap female-male | | 0.002 (0.001) | | | | -0.001 (0.002) |
| Share of female spouse's gifts at marriage | | 0.011 (0.082) | | | | -0.033 (0.069) |
| Ln (household assets) | | 0.005 (0.014) | | | | 0.004 (0.009) |
| Reform*Female spouse's father died after 1994/alive | 0.104*** (0.005) | 0.112*** (0.004) | 0.058* (0.016) | 0.012 (0.007) | 0.010 (0.006) | -0.026 (0.025) |
| Reform*Female spouse's father died in 1990-1993 | | | -0.085 (0.041) | | | -0.092* (0.031) |
| Reform*Education gap female-male | | -0.003 (0.001) | | | | -0.004 (0.002) |
| Reform*Share of female spouse's gifts at marriage | | -0.026 (0.082) | | | | 0.090 (0.069) |
| Reform*Ln (household assets) | | -0.007 (0.014) | | | | -0.009 (0.009) |
| Observations | 555 | 555 | 555 | 643 | 643 | 643 |
| R-squared | 0.390 | 0.392 | 0.392 | 0.425 | 0.434 | 0.427 |

Note: All regressions include village fixed effects as well gender and state specific year of birth fixed effects. Figures in brackets are robust standard errors clustered by state. * significant at 10%; ** significant at 5%; *** significant at 1%.

Appendix table 1. Descriptive statistics by state

| | Male | | | | Female | | | |
|--|--------|------------------|------------------|--------|--------|------------------|------------------|--------|
| | Total | Mahar- ashtra | Uttar Pradesh | Orissa | Total | Mahar- ashtra | Uttar Pradesh | Orissa |
| Generation II | | | | | | | | |
| Year of birth | 1960 | 1959 | 1960 | 1960 | 1964 | 1964 | 1964 | 1965 |
| Father died after 1994 or alive | 0.62 | 0.62 | 0.64 | 0.59 | 0.76 | 0.77 | 0.73 | 0.79 |
| <i>Individual characteristics</i> | | | | | | | | |
| Years of schooling | 6.63 | 5.90 | 7.63 | 6.19 | 3.53 | 3.83 | 3.07 | 3.77 |
| Education gap with spouse | 3.11 | 2.07 | 4.56 | 2.42 | -3.11 | -2.07 | -4.56 | -2.42 |
| Share of gifts received at marriage | 0.61 | 0.57 | 0.70 | 0.52 | 0.39 | 0.43 | 0.30 | 0.48 |
| Have an individual bank account | | | | | 0.25 | 0.26 | 0.34 | 0.12 |
| Having a sanitary latrine (household level) | | | | | 0.44 | 0.65 | 0.31 | 0.28 |
| <i>Reproductive behavior</i> | | | | | | | | |
| Number of children born | | | | | 3.18 | 2.78 | 3.91 | 3.11 |
| Share of daughters born | | | | | 0.44 | 0.45 | 0.42 | 0.45 |
| Survival rate of daughters | | | | | 0.97 | 0.97 | 0.96 | 0.97 |
| Survival rate of sons | | | | | 0.95 | 0.97 | 0.93 | 0.96 |
| No. of observations | 1,204 | 418 | 456 | 330 | 1,204 | 418 | 456 | 330 |
| Generation III | | | | | | | | |
| Year of birth | 1993 | 1993 | 1994 | 1993 | 1993 | 1993 | 1994 | 1993 |
| Years of schooling | 7.56 | 7.92 | 7.41 | 7.41 | 6.53 | 6.76 | 6.23 | 6.79 |
| No. of observations | 1,529 | 430 | 687 | 412 | 1,402 | 395 | 625 | 382 |
| Sample I (6-14) | | | | | | | | |
| % of the total sample | 26.95 | 23.49 | 30.86 | 24.03 | 27.03 | 25.57 | 29.76 | 24.08 |
| Currently enrolled | 0.91 | 0.91 | 0.93 | 0.88 | 0.90 | 0.87 | 0.91 | 0.92 |
| Expenses on education (Rs) | 967.05 | 1157.85 | 969.18 | 766.96 | 771.73 | 936.75 | 708.81 | 726.91 |
| of which on books/stationery | 0.87 | 0.79 | 0.92 | 0.83 | 0.89 | 0.87 | 0.94 | 0.82 |
| of which on transport/hostel | 0.07 | 0.19 | 0.05 | 0.02 | 0.07 | 0.13 | 0.04 | 0.06 |
| of which on private coaching/tuition | 0.06 | 0.01 | 0.04 | 0.16 | 0.04 | 0.00 | 0.02 | 0.12 |
| Share of time on productive work & housework | 0.08 | 0.07 | 0.08 | 0.09 | 0.10 | 0.09 | 0.09 | 0.12 |

| | | | | | | | | |
|--|-------|-------|-------|-------|-------|-------|-------|-------|
| Share of time on study | 0.28 | 0.29 | 0.28 | 0.27 | 0.28 | 0.29 | 0.27 | 0.29 |
| Share of time on leisure | 0.64 | 0.64 | 0.64 | 0.64 | 0.62 | 0.62 | 0.63 | 0.60 |
| Sample II (15-30) | | | | | | | | |
| % of the total sample | 65.53 | 70.23 | 61.86 | 66.75 | 65.41 | 66.58 | 62.40 | 69.11 |
| Completed primary education age 15-30 | 0.72 | 0.75 | 0.68 | 0.75 | 0.56 | 0.65 | 0.50 | 0.55 |
| Sample III (0-14) | | | | | | | | |
| % of the total sample | 31.65 | 28.37 | 33.19 | 32.52 | 31.60 | 32.41 | 32.32 | 29.58 |
| Treatment for preventable diseases | 0.54 | 0.51 | 0.51 | 0.60 | 0.58 | 0.58 | 0.51 | 0.69 |
| Treatment for preventable disease age 0-6 | 0.60 | 0.56 | 0.60 | 0.64 | 0.67 | 0.65 | 0.59 | 0.83 |
| Treatment for preventable disease age 7-14 | 0.50 | 0.49 | 0.48 | 0.58 | 0.54 | 0.55 | 0.49 | 0.64 |

Source: Own computation from 2011 REDS follow-up survey.

References:

- Agarwal, B. 1994. *A Field of One's Own: Gender and Land Rights in South Asia*. South Asian Studies. Cambridge; New York and Melbourne: Cambridge University Press.
- Ali, D. A., K. Deininger and M. Goldstein. 2014. "Environmental and Gender Impacts of Land Tenure Regularization in Africa: Pilot Evidence from Rwanda." *Journal of Development Economics* **110**, 262-275.
- Allen, D. W. 1992. "Marriage and Divorce - Comment." *American Economic Review*, **82**(3), 679-685.
- Anderson, S. 2003. "Why Dowry Payments Declined with Modernization in Europe but Are Rising in India." *Journal of Political Economy*, **111**(2), 269-310.
- Anderson, S. and M. Eswaran. 2009. "What Determines Female Autonomy? Evidence from Bangladesh." *Journal of Development Economics*, **90**(2), 179-191.
- Ashraf, N., E. Field and J. Lee. 2014. "Household Bargaining and Excess Fertility: An Experimental Study in Zambia." *American Economic Review*, **104**(7), 2210-2237.
- Becker, G. S. and N. Tomes. 1979. "An Equilibrium Theory of the Distribution of Income and Intergenerational Mobility." *Journal of Political Economy*, **87**(6), 1153-1189.
- Becker, S. O., F. Cinnirella and L. Woessmann. 2013. "Does Women's Education Affect Fertility? Evidence from Pre-Demographic Transition Prussia." *European Review of Economic History*, **17**(1), 24-44.
- Behrman, J. R. 1990. "Intrahousehold Allocation of Nutrients and Gender Effects: A Survey of Structural and Reduced Form Estimates." in S. R. Osmani (ed.), *Nutrition and Poverty*, Oxford University Press, Oxford.

Behrman, J. R. and M. R. Rosenzweig. 2004. "Parental Allocations to Children: New Evidence on Bequest Differences among Siblings." *Review of Economics and Statistics*, **86**(2), 637-640.

Bernheim, B. D., A. Shleifer and L. H. Summers. 1985. "The Strategic Bequest Motive." *Journal of Political Economy*, **93**(6), 1045-1076.

Blinder, A. S. 1973. "A Model of Inherited Wealth." *Quarterly Journal of Economics*, **61**(3), 608-626.

Chapoto, A., T. S. Jayne and N. M. Mason. 2011. "Widows' Land Security in the Era of Hiv/Aids: Panel Survey Evidence from Zambia." *Economic Development and Cultural Change*, **59**(3), 511-547.

Chari, A. V. and A. Maertens. 2014. "Gender, Productive Ability and the Perceived Returns to Education: Evidence from Rural India." *Economics Letters*, **122**(2), 253-257.

Chattopadhyay, R. and E. Duflo. 2004. "Women as Policy Makers: Evidence from a Randomized Policy Experiment in India." *Econometrica*, **72**(5), 1409-1443.

Chiappori, P. A., B. Fortin and G. Lacroix. 2002. "Marriage Market, Divorce Legislation, and Household Labor Supply." *Journal of Political Economy*, **110**(1), 37-72.

Cooper, E. and K. Bird. 2012. "Inheritance: A Gendered and Intergenerational Dimension of Poverty." *Development Policy Review*, **30**(5), 527-541.

Cowell, F. A. 1998. "Inheritance and the Distribution of Wealth." *STICERD Research paper 34*, Lodon.

Davies, J. B. 1982. "The Relative Importance of Inheritance and Other Factors on Economic Inequality." *Quarterly Journal of Economics*, **71**(2), 471-498.

De Nardi, M. 2004. "Wealth Inequality and Intergenerational Links." *Review of Economic Studies*, **71**(3), 743-768.

Deere, C. D., A. D. Oduro, H. Swaminathan and C. Doss. 2013. "Property Rights and the Gender Distribution of Wealth in Ecuador, Ghana and India." *Journal of Economic Inequality*, **11**(2), 249-265.

Deininger, K. 2003. *Land Policies for Growth and Poverty Reduction. A World Bank Policy Research Report*. World Bank and Oxford University Press, Oxford and New York.

Deininger, K. and R. Castagnini. 2006. "Incidence and Impact of Land Conflict in Uganda." *Journal of Economic Behavior & Organization*, **60**(3), 321-345.

Deininger, K., A. Goyal and H. K. Nagarajan. 2013. "Women's Inheritance Rights and Intergenerational Transmission of Resources in India." *Journal of Human Resources*, **48**(1), 114-141.

Diebolt, C. and F. Perrin. 2013. "From Stagnation to Sustained Growth: The Role of Female Empowerment." *American Economic Review*, **103**(3), 545-549.

Doss, C., M. Truong, G. Nabanoga and J. Namaalwa. 2012. "Women, Marriage and Asset Inheritance in Uganda." *Development Policy Review*, **30**(5), 597-616.

Duflo, E. 2003. "Grandmothers and Granddaughters: Old-Age Pensions and Intrahousehold Allocation in South Africa." *World Bank Economic Review*, **17**(1), 1-25.

Duflo, E. 2012. "Women Empowerment and Economic Development." *Journal of Economic Literature*, **50**(4), 1051-1079.

Dyson, T. and M. Moore. 1983. "Kinship Structure, Female Autonomy, and Demographic Behavior in India." *Population and Development Review*, **9**(12), 35-60.

Ellul, A., M. Pagano and F. Panunzi. 2010. "Inheritance Law and Investment in Family Firms." *American Economic Review*, **100**(5), 2414-2450.

- Eswaran, M. 2002. "The Empowerment of Women, Fertility, and Child Mortality: Towards a Theoretical Analysis." *Journal of Population Economics*, **15**(3), 433-454.
- Friedberg, L. 1998. "Did Unilateral Divorce Raise Divorce Rates? Evidence from Panel Data." *American Economic Review*, **88**(3), 608-627.
- Fulford, S. 2014. "Returns to Education in India." *World Development*, **59**, 434-450.
- Galiani, S. 2011. "The Dynamics of Land Titling Regularization and Market Development." *Working Paper*, Helsinki.
- Goetghebuer, T. and J. P. Platteau. 2010. "Inheritance Patterns in Migration-Prone Communities of the Peruvian Highlands." *Journal of Development Economics*, **93**(1), 71-87.
- Jensen, R. 2010. "The (Perceived) Returns to Education and the Demand for Schooling." *Quarterly Journal of Economics*, **125**(2), 515-548.
- Jensen, R. 2012. "Do Labor Market Opportunities Affect Young Women's Work and Family Decisions? Experimental Evidence from India." *Quarterly Journal of Economics*, **127**(2), 753-792.
- Kotlikoff, L. J. and L. H. Summers. 1980. "The Role of Intergenerational Transfers in Aggregate Capital Accumulation." *Working Paper*, Cambridge, MA.
- Kumar, N. and A. Quisumbing. 2012. "Inheritance Practices and Gender Differences in Poverty and Well-Being in Rural Ethiopia." *Development Policy Review*, **30**(5), 573-595.
- La Ferrara, E. 2003. "Kin Groups and Reciprocity: A Model of Credit Transactions in Ghana." *American Economic Review*, **93**(5), 1730-1751.
- La Ferrara, E. and A. Milazzo. 2012. "Customary Norms, Inheritance, and Human Capital." Bocconi University, Milan.

- Luke, N. and K. Munshi. 2011. "Women as Agents of Change: Female Income and Mobility in India." *Journal of Development Economics*, **94**(1), 1-17.
- Miller, G. and A. M. Mobarak. 2013. "Gender Differences in Preferences, Intra-Household Externalities, and Low Demand for Improved Cookstoves." National Bureau of Economic Research, Inc, NBER Working Papers: 18964.
- Peterman, A. 2011. "Women's Property Rights and Gendered Policies: Implications for Women's Long-Term Welfare in Rural Tanzania." *Journal of Development Studies*, **47**(1), 1-30.
- Peterman, A. 2012. "Widowhood and Asset Inheritance in Sub-Saharan Africa: Empirical Evidence from 15 Countries." *Development Policy Review*, **30**(5), 543-571.
- Peters, H. E. 1986. "Marriage and Divorce - Informational Constraints and Private Contracting." *American Economic Review*, **76**(3), 437-454.
- Platteau, J. P. and J.-M. Baland. 2001. "Impartial Inheritance Versus Equal Division: A Comparative Perspective Centered on Europe and Sub-Saharan Africa." in A. de Janvry, et al. (eds.), *Access to Land Rural Poverty and Public Action*, Oxford University Press, Oxford.
- Qian, N. 2008. "Missing Women and the Price of Tea in China: The Effect of Sex-Specific Earnings on Sex Imbalance." *Quarterly Journal of Economics*, **123**(3), 1251-1285.
- Quisumbing, A. R. 2001. "Women's Land Rights in the Transition to Individualized Ownership: Implications for Tree-Resource Management in Western Ghana." *Economic Development and Cultural Change*, **50**(1), 157-181.
- Rosenblum, D. 2012. "Unintended Consequences of Women's Inheritance Rights on Female Mortality in India." *Working Paper*, Halifax, NS.
- Rosenblum, D. 2013. "The Effect of Fertility Decisions on Excess Female Mortality in India." *Journal of Population Economics*, **26**(1), 147-180.

- Roy, S. 2013. "Empowering Women? Inheritance Rights, Female Education and Dowry Payments in India." *Working Paper*, Warwick University, Warwick.
- Stevenson, B. and J. Wolfers. 2006. "Bargaining in the Shadow of the Law: Divorce Laws and Family Distress." *Quarterly Journal of Economics*, **121**(1), 267-288.
- Stevenson, B. and J. Wolfers. 2007. "Marriage and Divorce: Changes and Their Driving Forces." *Journal of Economic Perspectives*, **21**(2), 27-52.
- Stiglitz, J. E. and A. Weiss. 1981. "Credit Rationing in Markets with Imperfect Information." *American Economic Review*, **71**(3), 393-410.
- Stopnitzky, Y. 2014. "The Bargaining Power of Missing Women: Evidence from a Sanitation Campaign in India." *Working Paper*, University of San Francisco, San Francisco.
- Strauss, J., G. Mwangi and K. Beegle. 2000. "Intrahousehold Allocations: A Review of Theories and Empirical Evidence." *Journal of African Economies*, **9**, 83-143.
- Thomas, D. 1990. "Intrahousehold Resource-Allocation - an Inferential Approach." *Journal of Human Resources*, **25**(4), 635-664.
- Wolfers, J. 2006. "Did Unilateral Divorce Laws Raise Divorce Rates? A Reconciliation and New Results." *American Economic Review*, **96**(5), 1802-1820.