Women's Inheritance Rights and Time Use: Evidence from India

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Abstract

This paper examines the impact of the Hindu Succession Act on married women's time use in India. The Hindu Succession Act was amended between 1976 and 2005 by giving equal inheritance rights to women for inheriting property. To estimate the effect of equal inheritance reform, I devise a difference-in-difference strategy by exploiting the features of the reform. Using the nationally representative Time Use Survey 2019, I find that women exposed to the reform are investing 46 minutes per day more in employment. Moreover, women exposed to the reform are spending 44 minutes per day less time on home production, with no change in their leisure time. By looking at the individual components of home production, I find that the reduction in home production is driven on account of a decline in time spent on domestic chores, with no change in child care work. In addition, I find that women exposed to reform devote slightly more time to learning. This implies that the reform has led women to substitute their time from home production to market work. These findings are consistent with an increase in women's autonomy effect. I also find evidence of intra-household substitution of home production work for exposed women through sharing the burden of home production by other house- hold members, especially the male members. This suggests that inheritance reform could be a form of reversal of the devaluing of women's domestic and reproductive labour.

Keywords: Time allocation, Equal inheritance reform, Women, India
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1. Introduction

Gender inequality has been a longstanding issue in developing countries. One reason for sustained gender inequality is the discriminatory nature of historical legal inheritance rights, which have favoured sons more than daughters. In South Asia, 50% of countries continue to have unequal inheritance rights that do not favour women (World Bank, 2012).[2] In such a scenario, women's legal inability to inherit property can adversely affect their access to economic opportunities as well as their economic in- dependence. According to World Bank (2012), legal reforms such as equal inheritance reform have the potential to improve women's economic outcomes and strengthen their economic empowerment.[3]

In this paper, I empirically examine how granting equal inheritance rights to women alter the time use allocation decisions among married women. Specifically, I examine the effects of the amendments to the Hindu Succession Act (HSA) on the time allocation of women who were exposed to it. The Indian government made amendments to the Hindu Succession Act 1956 (HSA) that gave women the legal right to inherit ancestral 'joint' property. This was done in a phased manner in different states between 1976 and 2005.[4] Conceptually, granting equal property inheritance rights to women can have two opposing effects on their time use. On one hand, an increase in women's ability to inherit property can be interpreted as an increase in their potential unearned income, which may generate an income effect on labour-leisure trade-off, thereby resulting in a decrease in labour supply and an increase in leisure time (some references would be good here). This is the standard 'Income' effect. On the other hand, an increase in legal ability to inherit property increases women's bargaining power or autonomy which, in turn, can induces her to allocate more time in out of home labour market activities (Field et al., 2016; Heath and Tan, 2020). This is the 'Autonomy' effect. Therefore, the effect of the equal inheritance rights on women's time use is a priori ambiguous and needs to be

[2]Unequal land inheritance is prevalent in many other developing economies, along with South Asian countries. In all Middle East and North African countries, 34% of sub-Saharan countries and one-fourth of East Asian and Pacific countries have unequal inheritance reform that disfavour woman.

[3] Many studies argue that granting property rights to women increases their bargaining power and improves their economic as well as non-economic outcomes (Carranza, 2012; Deininger et al., 2013; Jain, 2014; Roy, 2015; Harari, 2019; Bahrami-Rad, 2021).

[4]For example, Kerala introduced amendments in 1976, Andhra Pradesh in 1986, Tamil Nadu in 1989, and Maharashtra and Karnataka in 1994. Later on, it was ratified in other remaining states by the federal government in 2005, by giving equal property rights to women.

investigated.

I use the nationally representative latest Time Use Survey data from India for the analysis. I use two features of the reform to devise a difference-in-difference strategy for estimating the effect of HSA on women's time use. First, the HSA is only applicable to four religious communities: Hindu, Sikhs, Jains, and Buddhists (I call this as Hindu or treated religion), and second, the amendments to the HSA were for only those women who were unmarried at the time of reform.[5] I follow Duflo (2001) and identify the treatment effect by comparing the time use of women who were younger than the 10th percentile of the age of marriage distribution at the time when the reform was passed in their state to those women who were older than the 90th percentile of the age of distribution. Moreover, I compare this difference in women of treated religion to the difference in women of non-treated religion.

The primary outcome variable this paper considers is time spent by women per day in employment, home production, and leisure. I find that exposure to the HSA increased women's involvement in employment; that is, women exposed to the reform are spending 41 minutes per day more in employment, which amounts to an increase of 69% of the average time spent by women in employment. An increase in employment time corresponds to the 'Autonomy' effect, which dominates the standard income effect. This shows that granting equal inheritance right increases the women's bargaining power in the household and therefore, she prefers to invest more time in market work. Further, I find that women exposed to the reform are devoting less time to home production by 38 minutes per day, and there is no change in their leisure time. This implies that women are freeing up their time from home production and diverting this time to market work without any change in their leisure. Furthermore, the evidence shows that the reduction in time spent on home production is driven on account of a decline in time spent on domestic chores, with no change in childcare work. Moreover, the results also suggest that other members of the household, especially the male members, are sharing the burden of home production for these newly empowered women.

Although the total time spent in leisure does not change, there is a reallocation of

[5] For the detailed discussion on the Hindu Succession Act 1956, refer Roy (2015).

women's time across different kinds of leisure activities. For instance, women are shifting away their time from status production activities, *viz*., religious practices to socializing and self-care because of exposure to the inheritance reform. The shift from religious practices to socializing signals towards an increase in women's autonomy due to reform.

This paper relates to several strands of literature. A vast body of literature shows that property rights and control over assets enhance investment decisions (Goldstein and Udry, 2008), individual autonomy (Wang, 2014), and labour supply (Field, 2007). Specifically, giving access and ownership of assets to women increases women's bargaining power in the household (Agarwal, 1994; Wang, 2014) and generates many opportunities for their well-being (Field et al., 2016) as well as increases the welfare of future generations (Duflo, 2003). In this context, a body of literature examine the effect of gender-equal inheritance on different aspects of women's status or outcomes in the context of India (Jain, 2014; Anderson and Genicot, 2015; Bahrami-Rad, 2021) as well as other developing countries (Carranza, 2012; Harari, 2019).[6] While the women's inheritance reform has improved women's status or outcomes in other countries, the results are somewhat mixed for India. For instance, while Deininger et al. (2013), Roy (2015), and Bose and Das (2017) find that HSA reform increases the education among women who were of school-going age or unmarried at the time of reform, Rosenblum (2015) argues that the reform has increased the cost of having daughters, which reduces the parents' incentive to invest in their daughter's health, thereby leading to an increase in female mortality.[7] In addition, the evidence suggests that this reform has increased female foeticide and intensified son preference (Bhalotra et al., 2020). Similarly, Anderson and Genicot (2015) argue that increasing women's property rights may have increased the intra-household conflicts due to the backlash effect and thereby increased suicide rates among men and women.

A handful of studies have also examined how the HSA has also led to an increase in women's bargaining power in their marital households. It is believed that women who

[6]Carranza (2012) finds that gender-equal inheritance reform in Indonesia decreased son preference and fertility. Similarly, Harari (2019) finds that inheritance reform in Kenya improved women's outcomes on several dimensions including education, health, age at marriage, fertility, and bargaining power.

[7]Roy (2015) finds that parents are compensating their young daughters who are of school-going age or marriage age either by giving them more education or more dowries to avoid giving them a share in the property.

own property have a strong option outside marriage, and this raises their bargaining power within marriage (Roy, 2008; Heath and Tan, 2020). This increase in bargaining power induced by exposure to HSA has increased women's control over financial resources, increased the age at marriage (Heath and Tan, 2020), improved women's nutritional outcomes, and lowered their risk of death (Calvi, 2020).[8] While the literature on inheritance reform has focused on a wide variety of women's outcomes, no paper has examined its influence on women's time use. This paper contributes to this literature on how inheritance reform affects women's time use allocation, which is one of the key economic outcomes.

This paper also relates to the literature on the factors that influence women's time use, labour force participation, and gender division of labour (Becker, 1981; Fafchamps and Quisumbing, 2003; Afridi et al., 2019). Norms around the gendered division of labour and perceptions of women's primary role as homemakers among other factors restrict their work participation in the labour market (Duflo, 2012; Eswaran et al., 2013; Jayachandran, 2021). However, women do not only change their labour supply at an extensive margin, that is, choose to completely drop out of the labour market. They may also respond to these norms by altering their labour supply decisions at the 'intensive margin', that is, by choosing the time allocated to market work (Bertrand et al., 2015). Such dynamics in the women's labour supply could only be seen in their time-use allocation rather than in her labour participation decisions. This paper adds to this literature by highlighting the role of pro-women policy in influencing their time use allocation by altering their activity patterns (Gray, 1998; Maity, 2020). This paper also highlights how legislative pro-women reform related to inheritance can be useful in counteracting traditional gender-roles.

The rest of the paper is organized as follows. The next section lays down the institutional context of the Hindu Succession Act. Section 3 describes the data and descriptive statistics. The empirical strategy is described in Section 4. Section 5 explains the results and robustness checks are presented in Section 6. In the last section, I conclude.

[8]Moreover, Deininger et al. (2019) find that HSA not only benefitted the women exposed to the reform, but their children also benefitted by improving their education and health outcomes, especially for girls. On the contrary, Bose and Das (2017) find that HSA does not find any effect on girls' education in households with mothers exposed to reform but observes a significant decline in boy's education.

2. The Institutional Background of the Hindu Succession Act 1956

Although the Indian constitution treats every citizen equally, the inheritance rights in India remained gender biased. Before the colonial period, inheritance rights were mainly governed by the *Mitakshara* system in the country. Under *Mitakshara*, there was a distinction between a male's joint ancestral property and private property. Joint ancestral property primarily refers to property that has been inherited from the ancestors or grandfathers or great-grandfathers, along with any property that has been acquired jointly or any private property that has been included in the joint property. Private property refers to property purchased by an individual on his own. Under the *Mitakshara* system, sons were given the coparcenary rights by birth and thus allowed to inherit joint ancestral property. These inheritance rights were not applicable in the case of private property, which could be bequeathed only as per the owner wish or at will. However, daughters were not given any coparcenary rights by birth for inheriting joint ancestral property. Daughters or widows were allowed to inherit ancestral property only in the absence of male heirs (Agarwal, 1994).[9]

Later on, all the traditional inheritance schemes were amalgamated into the HSA of 1956, which clarified women's right over inheriting private property. Daughters and widows were given equal rights in a male's private property and his notional share of joint ancestral property in case of intestate. In other words, if a male died intestate, then his wife and daughters along with his sons had given an equal legal right to inherit his private property and his 'notional' share of joint ancestral property. But the inequalities continued, and daughters were still given the coparcenary rights in 'joint' ancestral property. Only the sons or male heirs continued to have coparcenary rights by birth over joint ancestral property. This implies that even after the HSA of 1956, inheritance rights were gender biased and discriminated against women in India.

Inheritance is a concurrent subject in the Indian constitution where both federal and state governments have legislative authority, and therefore, in subsequent years, various states introduced amendments to the HSA to make daughters coparceners in the joint family

[9]Women were allowed to inherit their father's or husband's property only in the absence of four generations of agnatic male heirs.

property. For example, Kerala introduced amendments in 1976, Andhra Pradesh in 1986, Tamil Nadu in 1989, and Maharashtra and Karnataka in 1994 and subsequently, in 2005, the Indian central government ratified it in the remaining states in a similar manner by removing the gender inequality in inheritance rights. The HSA amendments apply to only women who are Hindu, Sikh, Jain, or Buddhist, and only to those women who were unmarried at the time of reform (Roy 2008; Ajefu et. al, 2022). Since more than 90 percent of the total property belong to the 'joint' ancestral property (Roy, 2015), reforms related to inheritance are important in determining asset ownership.

3. Data and Descriptive Statistics

(a) Data

I use the nationally representative Time Use Survey (TUS) conducted by the National Statistical Office (NSO) during months of January–December 2019. It is the first nationwide survey that covers 138,799 households spread across 9,945 first-stage units (FSUs) in both rural and urban sectors of India.[10] The sample is drawn using a stratified two-stage design. In the first stage, the villages and urban towns of given states are divided into various FSUs that have been selected, and in the second stage, a certain number of households have been surveyed within each FSU.

The TUS primarily records the information on time disposition in different paid and unpaid activities carried out by an individual, who is at least six years old, during some specified reference period. The reference period starts at 4 am on a preceding day before the survey to 4 am on the survey day, equivalent to 24 hours. These 24 hours have been split into 48 time slots of 30 minutes each. Each individual is asked about their activities carried out in these assigned time slots. If an individual performs multiple activities in a given period, then all the activities performed for more than 10 minutes are recorded.[11] These activities reported by individuals have been classified, following the International Classification of Activities for Time Use Statistics, 2016. The TUS provides information on not only time spent in paid and unpaid activities (e.g., domestic work, volunteer

[10]Except a few villages of Andaman and Nicobar Islands were not surveyed as they were difficult to access.

[11]The survey also asks whether the survey day was normal or abnormal day for the respondent. I do not classify between these days for the analysis. However, the main results hold true if we drop observations with abnormal days.

services) but also on time spent by an individual in, for example, socialising, recreation, religious practices and self-care. The advantage of using time use survey data is that it provides more comprehensive information on women's work by measuring the time spent in all the activities without asking respondents directly whether they are 'employed' or 'unemployed' (Hirway, 2012).[12]

In this paper, the main focus is on time spent in a day in different activities by women who are between the ages of 15 and 60 years. I classify all the activities broadly into these three categories. The employment activity mainly includes the paid activities that generate income by working outside or in the home enterprise. Home production includes time devoted to domestic chores, childcare, and caregiving to others. Leisure consists of time spent on socializing, religious practices, recreation, and self-care activities. A detailed description of these activities is given in Appendix Table B1.[13]

The time spent by an individual in each of these activities is measured by calculating the number of minutes spent by an individual in a day in any particular activity. However, if an individual is not participating in any specific activity during the day, then the time spent in that is coded as 0. If an individual reports a single activity in a time slot, then the entire time of that slot is assigned to that activity. However, if an individual reports multiple activities in a time slot, then the entire time of that slot is assigned equally to all those activities. In addition, the data provide information on individual demographic characteristics, including age, education, and employment status; and household characteristics, including religion, social group, household composition, and monthly per-capita expenditure.

(b) Descriptive Statistics

Table 1 shows descriptive statistics for the women in the estimation samples across

[12]Women in India, especially married, are generally engaged in irregular informal work that can be easily done with domestic chores and childcare simultaneously at home. Women's engagement in these informal home-based activities are not considered work and is often misinterpreted as unpaid domestic work (Hirway and Jose, 2011). The standard labour force surveys consider these women as 'non-worker'. However, the time use survey data captures the information on women's activities without asking respondents directly whether they are 'employed' or 'unemployed'.

[13]I exclude the activities like learning and volunteering activities from analysis. The time spend on these activities by women in the sample is only 2.3 minutes per day each.

Hindu (also call it as treated religion) and non-Hindu religions (call it non-treated religion). The distribution of the women in treated religion is as follows: 96.5% are Hindus followed by Sikhs (2.2%), Buddhists (1.0%) and Jains (0.3%). Among non-treated religion, 69.1% are Muslims, 26.2% are Christians and 4.7% belongs to other religion.

Looking at the time use figures, it is observed that women spend a smaller amount of their daily time in employment activity: Hindu women devote 71 minutes and non-Hindu women devote only 46 minutes per day in employment. Women are primarily devoting more time to home production (381 minutes by Hindu women and 402 by non-Hindu women), especially in domestic chores (325 minutes by Hindu women and 329 minutes by non-Hindu women), followed by child care (54 minutes by Hindu and 70 minutes by non-Hindu). Interestingly, they spend two-thirds of their daily time, which amounts to around 955 minutes, to leisure which includes activities like socialising, religious practices, recreation and self-care. Most of the time spent in leisure is coming from time spent in self-care activities like sleeping, eating, and personal hygiene. The table shows that Hindu and non-Hindu women are spending 700 minutes and 693 minutes per day on self-care, respectively. Interestingly, Hindu women spend significantly less time in religious practices (15 minutes/day) compared to non-Hindu women (31 minutes/day).

Interestingly, this table shows that there are systematic differences in time allocations between Hindu and non-Hindu women. Hindu women are spending significantly more time on employment and less time on home production.

4. Empirical Strategy

This paper explores the cross-sectional variation of the TUS to capture the effect of HSA amendments on women's time use allocations. Even though the data were collected after the nationwide implementation of the HSA reform, it is still possible to estimate treatment effects by comparing cohorts of women likely to be married before versus after the HSA (Heath and Tan, 2020). For this, I exploit two features of the reform to devise identification strategy. One, the reform applied only to those women who were not married at the time of the reform, which came into force in different years across different states (as mentioned in Section 3), and two, it is applicable only for households

belonging to Hindu, Buddhist, Sikh, or Jain religions. The obvious choice of treatment group therefore would be women who were not married at the time of reform in their respective states and compare their outcomes with women who were married at the time of reform, across treated and non-treated religions. But the year of marriage is unknown in time use survey. Therefore, it is difficult to identify the actual marital status at the time of reform for women in the sample to create the treatment and control cohort.

To solve this issue, I use NFHS-3 (National Family Health Survey-3) to define treated and control group. I do this in the following steps: First, I construct the age-at-marriage distribution from NFHS-3 for each reform year in which the reform was introduced in Indian states. These distributions are given in Figure 1. Then, I calculate two thresholds, *viz*., 10th and 90th percentile of distribution, for each of these five age-at-marriage distributions. For instance, the red dash line and brown solid line in each panel of Figure1 represents the 10th and 90th percentile of age-at-marriage in each reform year. In the last step, I calculate the age-at-reform for each sampled women in the TUS and compare it with these thresholds to construct treated and control cohort. I therefore construct a treated cohort consisting of women whose age was less than the 10th percentile of the age-at-marriage during the year when the reform was passed in their state. The idea is that these women who are more likely to be unmarried at the time of reform. Similarly, women whose age was more than the 90th percentile of age-at-marriage during the year when the reform was passed in their state are classified into non-treated cohort. For each state, I construct the treated and control cohort using age-at-marriage distribution of their respective reform year in which it was passed. Further details on NFHS-3 and, construction of age-at-marriage distribution and treated cohort are given in Appendix A.

Subsequently, I compare the outcomes of women of younger cohorts who were not of marriageable age at the time of reform (call treated cohort) with those of older cohorts who would have been married at the time of reform (call control cohort). This strategy is similar to what has been used by Duflo (2001) in her paper, related to education reform that compares the outcomes of children of younger cohorts who were of school age at the time of reform with those of older cohorts who would have completed their school education. I therefore consider the following equation for estimation:

$$Y_{irft} = \beta_1 Treatedcohort_{it} \times Hindu_{ir} + \beta_2 Treatedcohort_{it} + \boldsymbol{X}'_{irft}\Gamma + \delta_f + \gamma_t + \lambda_r + \mu_{rt} + \epsilon_{irft} \quad (1)$$

where Y_{irft} is the time spent in minutes per day in any particular activity spent by a given woman i of religion r born in year t residing in region (village or urban town) f of a given state. $Treatedcohort_{it}$ is a dummy variable that takes value 1 if the woman i belongs to the treated cohort, i.e. if she is younger than the 10th percentile of the age-at-marriage during the year the reform was introduced in the state and 0 if she belongs to the control cohort, i.e. if she is older than the 90th percentile of the age-at-marriage during the year the reform was equalized in their state. $Hindu_r$ is a binary variable that takes value 1 if the woman belongs to Hindu, Buddhist, Sikh, or Jain religion and 0 if the woman is Muslim, Christian, Parsi, Jewish, or other. X'_{irft} controls for women's age, education, social group, household size, household income and landholding, head education and presence of kids.

An important concern with this estimation strategy is that state-level unobserved factors could be correlated with inheritance reform that could also affect the time use allocations. Some states in India have recently introduced certain policies at the state level that directly or indirectly affect women's employment and thereby have an impact on women's time use.[14] To account for this, I control for state fixed effects. However, it is also plausible to assume that there could be some unobserved factors at the sub-region level within a state that can differentially affect the time use allocations across different villages/urban towns within a state independently of the reform. To correct this, I replace the state fixed effects with sub-region or FSU fixed effects (δ_f). As a part of the sampling strategy, a state has been divided into various sub-regions called FSUs, which are either villages in rural regions or urban towns. FSU fixed effects encompass state-level fixed effects and therefore comprehensively control for state-specific time-invariant characteristics as well as time-invariant unobservable that affect women's time use allocations across different states. Additionally, time-invariant unobserved heterogeneity is also controlled at lower-level, such as at the village or town level.

[14]For example, the Bihar state government has introduced the scheme named '*Aarakshit Rozgaar Mahilaon ka Adhikaar*' to boost female employment, under which 35 percent of state government jobs are reserved for women.

Next, I control for year of birth (γ_t) and religion (λ_r) to control for differences in women's time use allocations that may vary across different age groups or religions. Additionally, I include religion-specific birth-cohort fixed effects (μ_{rt}), which accounts for the fact that there may be certain religion-specific policies or unobserved factors that affect the time use allocations differentially among women of different age cohorts within the same religion. In addition, if these religions may have evolved in general over time, then it would be captured by religion-specific time fixed effects. Standard errors are clustered at the district level.

β_1 is the coefficient of interest and captures the difference in time use allocations for the treated cohort relative to the control cohort because of exposure to HSA, after controlling for region, time, religion, and religion-specific time fixed effects. Here, the main identifying assumption is that, in the absence of the reform, any difference in time-use allocations between treated and control cohorts would have been the same across Hindu and non-Hindu women. This empirical strategy will fall, if pre-trend reforms in women's time-use allocation are different among Hindu and non-Hindu women. I carry out two falsification tests to check for this assumption and establish the validity of the identification strategy. In addition, a number of robustness checks have been carried out, the details for which are given in the Section 7.

5. Results

Table 2 reports the estimates for the impact of HSA reform on women's time-use allocation across activities: employment, home production and leisure. The time spent in any activity is measured as number of minutes spends per day in that activity. The first row of the table reports the estimates for β_1 coefficient from Equation (1). Columns (1)–(3) present the estimates from the specification controlling for region, religion, year, and religion-specific time fixed effects. These estimates for β_1 show that women exposed to inheritance reform experience a significant increase on time allocated to employment and significant decline in time spend on home production. However, the estimates do not show any change in time allocated to leisure due to exposure to reform.

In next specification from columns (4)-(6), I also control for demographic characteristics

along with all fixed effects. I use this as preferred specification for the analysis. I find that the direction of results remain the same, only magnitude go down slightly. These estimates show that women who have been exposed to inheritance reform increases time spent on employment by 40 minutes per day, which is equivalent to an increase of 60% of mean time spent by married women on employment.[15] In column (5), the coefficient for dependent variable home production is negative and statistically significant at the 1% level. This shows that women exposed to reform are spending 38 minutes per day less in home production, which is equivalent to around 10% of average time spent to home production. The next column further shows that HSA reform has no impact on leisure time, as the coefficient is statistically insignificant.

These results provide evidence in favor autonomy effect: HSA increased women's autonomy, thereby increasing women's time allocated to labour market. An improvement in the legal ability to inherit property increases women's autonomy by raising her control over resources. This increase in autonomy increases her control over earnings as well, as a result she finds it gainful working outside. Therefore, she spends more time to employment. These results further highlight that an increase in women's bargaining power induces her to free up her time from home production and reallocate it to labour market, without any compensatory change in her leisure time. Women generally spend at least three to seven times more work hours on unpaid domestic and care work compared to men and, when both paid and unpaid work is considered, women bear a higher work burden than men (World Bank, 2012). The higher burden of domestic work is related to women's well- being and has an impact on women's ability to participate in the labour market (Duflo, 2012). Therefore, if one looks at women's well-being in terms of time use, it is visible that the reform has not increased their burden of work as leisure time remains unaltered. Infact, they are investing more time in employment by diverting their time from home production, not from leisure time.

[15]This finding aligns with those of Heath and Tan (2020), but they examine the impact on labour supply through extensive margin. They find that probability of women engaged in employment increases by 3.8–6.1 percentage points. However, this paper examines labour supply in terms of time allocation which measures labour supply at both intensive as well as extensive margin. Given that women generally spend fewer hours per day in employment because of gender-specific roles and mobility constraints, the study of labour supply in terms of time allocation is notably important, and an increase of such a large magnitude is noteworthy. Moreover, they only examine the impact on employment; this paper examines the effect on a broader range of women's work including home production.

Next, Table 3 shows the impact of the Hindu Succession Act on different employment categories based on location, type of enterprise, and industry. The estimates from columns (1)—(4) show that the increase in the time allocated to employment mainly come from women who are working outside their home and working as salaried and wage employee. Furthermore, I find that time allocated to employment is increased for women engaged in agriculture and non-technical services sector.

Table 4 presents the heterogeneous effects of the inheritance reform on women's time allocation. I disaggregate the results by location of residence, family structure, household wealth status and women's education level. I find that increase in time spent on employment is greater for rural and poor households compared to their counterparts. Whereas the decline in time spent to home production is greater for urban and rich households. I also find that the impact of inheritance reform is more pronounced for women staying in joint families relative to women staying in nuclear households; probably housework burden is shared by more people in the joint families which free up women's time for market work. The impact of inheritance reform exists for all women, however with larger impacts for women with higher education. This finding rule out the possibility of increase in women's education as the potential mechanism for driving main results.

5.1. Possible Mechanisms

(a) Linking to women's autonomy

This section provides suggestive evidence for potential mechanisms through which an improvement in women's inheritance rights can affect their time use allocation. I examine the role of women's autonomy as potential mechanism for driving these results. Women's engagement in domestic chores is generally deemed household public service. Her domestic work is deemed to be less worthy and subordinates her status in the family (Anderson and Eswaran 2009). Moreover, women's mobility and ability to make social networks outside the home are also restricted (Anukriti et al., 2020). The subordination of women in such patriarchal societies is strongly supported by norms that promotes women's seclusion within home and enforce their exclusion from public spaces.

Therefore, married women in India generally engaged more in home production and status production activities due to less autonomy.[16]

To establish the autonomy channel, I re-estimate Equation (1) on the individual components of home production and leisure. Table 5 presents the estimates. Columns (1)–(3) show estimates for home production components. Because of exposure to HSA, women experienced a decline in time spent in domestic chores significantly—namely, a decline of 39 minutes per day, which amounts to 11.9% of the average time spent by married women in domestic chores. However, I do not find any significant change for time spent in any care-giving activities (childcare and others). Women release their time from domestic duties, but their preference for time devoted to childcare remains unchanged.[17] This suggest that decline in home production is attributed to lesser time spend in domestic work.

The results for the components of leisure are shown in subsequent columns of Table 5. I find that even though the impact on the total time spent on leisure remains unchanged, there is an indication of reallocation of women's time across different leisure activities. For example, women exposed to the reform are spending significantly less time in religious practices, which amounts to 21 minutes per day. This decline in religious practices is offset by an increase in time spent on socialising and self-care. Even though the estimates for socialising and self-care activities are weakly significant, the effect of reform on these activities is however positive.

By looking at these results, one can draw conclusion on increase in women's autonomy due to reform.[18] In patriarchal societies, where the cultural and social norms restrict

[16]Status production activities include performing rituals and attending religious ceremonies (Papanek, 1979; Bardhan, 1985; Eswaran et al., 2013)

[17]I also estimate these results in the sample of households where there are no children. The main results hold true even in the absence of children.

[18]In this paper, I argue that the inheritance rights can affect the women labour supply and time allocation through increase in autonomy. However, it is also possible that the HSA could impact pre-marital human capital investments (e.g., education or health investments and shift in marriage age) or change the characteristics of marital matching (e.g., change in average husband characteristics), which may potentially lead to a change in women's time allocation rather than autonomy effect. In this context, Heath and Tan (2020) found that there is minimal evidence of change in pre-marital characteristics and no evidence of change in the extent of assortative matching. Therefore, I can rule out the possibility that these factors may be the primary driver for the observed change in time patterns. For example, in the next section where I check for the heterogeneity of estimates along women's education, I find no differential effect on time spent on employment for those women who are highly educated. This shows that even among the women of higher education, the autonomy effect is at play and the

women's autonomy, one will find that women are mainly engaged in home-based activities. Less time spend on domestic chores and religious practices, and more time spend on socialising activities by women exposed to reform signal towards the increase in women's autonomy due to reform. This is consistent with the findings of previous studies who found that women experience an increase in their autonomy as a result of improvement in inheritance rights through HSA reform (Roy 2008; Heath and Tan 2020).[19] The relation between women's autonomy and gender-equal inheritance rights is well-established in the context of India as well as other developing countries (Roy, 2008; Carranza, 2012; Heath and Tan, 2020).

(b) Intra-household Dynamics

In this section, I explore another potential mechanism through the decline in home production time is being compensated within the household. Less time spent in home production by women could possibly be compensated by two channels: first, the other household members are increasing their time to home production or, second, the home production work is substituted by market services, such as by hiring maids or using machines for household work. To explore this, I estimate the following regression:

$$Y_{hrf} = \beta_1 Treatedwomen_{hf} \times Hindu_r + \beta_2 Treatedwomen_{hf} + \boldsymbol{X}'_{hrf}\Gamma + \delta_f + \gamma_r + \epsilon_{hrf} \quad (2)$$

where Y_{hrf} is either the number of minutes spent per day by other household members (separately for children and other adult members) in home production in household h or, an indicator variable if given household uses machine or any outside help for cleaning clothes or floor. Equation (2) is analogous to equation (1) except that $Treatedwomen_{hf}$ is now defined at the household level and takes the value 1 if at least one woman in the household belongs to the treated cohort and 0 otherwise. $Hindu_r$ is a binary variable that takes value 1 if the woman belongs to Hindu, Buddhist, Sikh, or Jain religion and 0 if the woman is from Muslim, Christian, Parsi, Jewish, or other religion. X'_{hrf} are demographic controls which includes individual and household characteristics. δ_f and γ_r represent

dominant channel.

[19]These studies have used the direct measure of bargaining power and decision making to examine the effect on women's autonomy. However, such direct measures are not available in Time Use Survey.

FSU and religion fixed effects.

Table 6 presents the estimates from Equation (2). The dependent variable in columns (1)–(4) is the time spent in home production by different household members, which are boys and girls (6–14 years), men, and other women in the household who have not been exposed to the reform. The estimates show that in a household where women have been exposed to HSA reform, other members of the household are spending more time on home production. These estimates vary from 3–18 minutes per day more. The major increase in home production is coming mainly from male members of the household, who increase their time spend to home production by 18 minutes per day. The decline in home production by newly empowered women is largely compensated by male members of the household.

Furthermore, Column (5) does not show any significant difference in the use of machines or any other help for cleaning between those who have been exposed to reform versus those who do not.[20] The findings highlight that women are able to receive help from other members of the same household in sharing the responsibility of home production as a result of an increase in their autonomy. The inheritance reform has possibly been able to counteract the traditional-gender roles.

(c) Evidence from Panel Data

The earlier state amendments to HSA, which came before 2005 in five states, differentiated between married and unmarried women. It is however been argued that the Central amendment to the HSA legislated in 2005 does not differentiate between married and unmarried daughters.[21] Even if this correct, I argue in this section that it does not affect the identification strategy described in Section 4.

[20]The survey has two questions in which household is asked on how do they clean their floor and clothes (separate question for each), whether mechanically, manually or through outsourcing. I use this information to construct the dependent variable of Column (5) in Table 5. If a household uses machine or outsource, then this variable takes a value 1 and 0otherwise.

[21]The central amendment does not clearly specify to whom this amendments are eligible. In 2005, when central amendments came into force, they were interpreted in similar lines with earlier state amendments. Therefore, a lot of studies on HSA which came after 2005 use this differential applicability of law between married and unmarried women as their identification strategy. The central amendment is available here: *https://egazette.nic.in/WriteReadData/2005/E_45_2012_114.pdf*

However, prior to 2020, whether the father had died prior to or was alive on the date of the amendment was relevant for determining inheritance rights to daughters. Daughters were benefitted *only if their father would have been alive at the time of amendment of the law.*[22] The identification strategy laid down in Section 4 effectively compares the time use differences between younger and older cohort across Hindu (Treated) and non-Hindu (non-Treated) religion. If one has a reason to believe that older women in India are less likely to ask for property division or their father wouldn't have been alive at the time of law amendment, then the given identification strategy (laid down in Section 4) will go through and will give the true treatment effect.

To solve this issue further, I do further analysis by combining Time Use Survey, 1998 (call it TUS-1) with the latest round of Time Use Survey, 2019 (call it TUS-2). TUS-1 was conducted in 18591 households spread over six selected states, namely, Haryana, Madhya Pradesh, Gujarat, Odisha, Tamil Nadu, and Meghalaya during the period of July 1998 to June 1999. This was the first time use survey conducted in India on pilot basis. In TUS-1, Tamil Nadu is the only state in which the state amendments came prior to survey year. I combine both time use surveys, TUS-1 and TUS-2, to construct pseudo state-level panel data. I drop observations from two states, Haryana and Meghalaya, due to small sample size.[23] Therefore, the final sample will include observations from the remaining selected four states which were surveyed in TUS-1.

The estimates from panel data are presented in Table 7. This analysis rests on the assumption that prior to 2005, the state amendments differentiated between married and unmarried women; however in 2005, there was no such differentiation. This implies that during TUS-1, the reform came in Tamil Nadu only but was only applicable for those women who were unmarried at the time of reform. Later on, in 2005, the reform was amended in the remaining states for both married and unmarried women. Accordingly, I define treatment as binary variable which takes the value 1 for those women who were eligible for amended law during the year survey was conducted and 0 for those who were

[22]However, later on, in August 2020, this was clarified and whether father is alive or not became irrelevant for the daughter to get benefit. See the following article for reference: *https://thewire.in/law/hindu-succession-act-women-supreme-court*.

[23]However, the results from panel data remain same even after including observations from these two states.

not eligible for new rules during survey year.[24] After constructing treatment variable, I therefore estimate the following regression specification:

$$Y_{ist} = \alpha_s + \gamma_t + Treatment_{ist} + \boldsymbol{X}'_{ist}\Gamma + \epsilon_{ist}$$

Here Y_{ist} measures the number of minutes spends per day by woman *i* in employment, home production and leisure. α_s and γ_t represent state and year of birth fixed effects. X_{ist} is a set of vector of individual and household level controls like women's age and education, social group, religion, land holding, income, household size, presence of kids in household and household head's education. This identification strategy is similar to previous studies like Roy (2008), and so on.

The first three columns in Table 7 show these estimates. I find that women who were eligible for amendments experienced an increase in time spend to employment and leisure, which amounts to 31 and 36 minutes per day. Moreover, they experience a substantial decline time devoted to home production. This is similar to the findings of Table 2, except of an increase in leisure time. Despite this, the main results remain intact that inheritance rights to women have increased women's autonomy and as a result, they free up their time from home production, which allow them to spend more time to employment and leisure. This also highlights that these newly empowered women are not working more.

The next three columns of Table 7 show estimates from the panel data only for Tamil Nadu. These estimates are similar to the previous result, but with higher effect size. As Tamil Nadu is only state in which the state amendments came prior to TUS-1 survey year; these panel estimates for Tamil Nadu show the long-run effect of HSA amendments on women's time use.

These results from panel data are suggestive of the fact that legal amendments has led to change in women time use patterns by increasing their labor hours and decreasing their time in home production, irrespective of the central amendment's differential

[24] The control group include women residing in Tamil Nadu who were married in TUS-1 and women residing in states Gujarat, Madhya Pradesh, and Odisha in TUS-1 irrespective of their marital status. The rest of women are part of treatment group.

applicability with respect to women's marital status or not.

6. Robustness Checks

To test the validity of the main results, I carry out a set of falsification tests and robustness checks. In what follows, I present these findings in this section.

a. Falsification Tests

In the first falsification test, I compare the time use allocations of older and younger women between the Hindu and non-Hindu who were not exposed to the reform as they were too old at the time of the reform. For this, I construct an arbitrary treatment and control cohort with those women who were not exposed to the reform. The new treatment cohort consists of women who were older by 13 years or fewer than the 90th percentile of the age-at-marriage distribution at the time of reform in her state. Similarly, a new control cohort is defined as women who were older by 14 years or more than the 90th percentile of the age-at-marriage at the time of reform in her state. For instance, if the 90th percentile of the age at marriage is 18 years, then women who were between 18 and 35 years old at the time of reform are in the treatment cohort and women older than 35 in the control cohort. I re-estimate the Equation (1) with the new arbitrary treatment and control cohort. If there are no differential trends in time allocation between Hindu and non-Hindu women, then the coefficient β_1 estimated with this new treatment cohort should be statistically insignificant. Panel A of Appendix Table B2 shows that these estimates are statistically insignificant, which signify the absence of pre-trends among the women who were not exposed to the reform.

In the second falsification test, I compare the time-use allocation of married men using Equation (1) by focusing on the sample of married men between the ages of 15 and 60 years and the results are shown in Panel B of Appendix Table B2. If there is a general change in time use allocation which could be common to the Hindu young cohorts who are exposed to reform, then a similar effect in time use allocation will be visible for Hindu young men as well. The results presented in Panel B suggest no significant effect of exposure to the reform on young Hindu men's time use patterns. This rules out the

possibility of any change in the time use patterns of the Hindu young cohort or population who were exposed to reform.

The next falsification test arbitrarily selects the false reform states by assigning each state in the sample a different random number and then assigns the first five states the treatment year of the true reform states. Then, random state 1 assigns a false reform year since 1977, random state 2 assigns a false reform year since 1987, and random states 3, 4 and 5 assigns a false reform year since 1989, 1994, and 1994, respectively. I then estimate Equation (1) using these pseudo reform states. The results presented in Panel C of Appendix Table B2 show significant difference from the estimates in Table 2.

These falsification tests are suggestive that there were no pre-trends in time use patterns of women prior to reform and the estimated effects in Table 2 are due to change in legal amendments.

b. 10 year-long cohort

One confounding factor which may bias estimates is that the results could be driven by women who were very far from the age of marriage at the time of the reform. To rule out this possibility, I re-estimate Equation (1) with 10-year-long cohorts in both the treatment and control cohorts and the results of this robustness check are presented in columns (1)–(3) of Appendix Table B3. The estimates are similar to the main findings and suggest that results are not driven by this concern.

c. Early reformer states

In the next robustness check, I focus only on the early reformer states in which case the nationwide implementation of the reform is not considered. I re-run the results only by considering women in states of undivided Andhra Pradesh, Kerala, Karnataka, Maharashtra, and Tamil Nadu. The results are presented in columns (4)–(6) of Appendix Table B3 and similar to the main findings.

d. Inclusion of religion-time and state-time trends

Even with variety of fixed effects, there is possibility that average employment of Hindu women in younger cohorts increasing faster over time as compared to other religions. To account for this, I replace religion-birth year fixed effects with religion-specific time trends. These results are shown in panel A of Appendix Table B4 and find that the main results holds true. Next, I also extend the empirical specification in Equation (1) by including state-year linear trends to account for state-specific time-varying factors that may differentially affect the women's time allocation across different states. Panel B of Appendix Table B4 shows robustness of the main results with inclusion of state-specific time trends.

e. Transforming dependent variable

I transform the dependent variable using Inverse Hyperbolic Sine (IHS) transformation. This transformation is defined at zero.[25] Panel C in Appendix Table B4 show that women exposed to reform experience a 66 percent increase in time spent in employment per day. Whereas the time spend per day on home production decline by 11 percent. In terms of magnitude, the results are similar to the findings of Table 2. The impact on leisure activity remains insignificant even after the transformation.

f. Clustering at the state-Hindu level

Panel D in Appendix Table B4 present the estimates for clustering standard errors at the state-Hindu level. This takes into account any possible correlation that may affect women's time use and the introduction of HSA reform within a state within treated religion. The results remain robust when standard errors are clustered at the state-Hindu level.

7. Conclusion

[25]The IHS transformation of a given variable x is given by $logx = (x + (x^2 + 1)^{(1/2)})$. This transformation is used to transform variables that include zero or negative values

This paper examines the impact of the gender-equal inheritance reform on married women's time use. I exploit the variations in the HSA amendments across religions and cohorts to estimate the impact. Specifically, I find that exposure to the HSA, which raised women's ability to inherit property, increased the time spent by women in outside employment work and decreased their engagement in home production. I find an increase of 41 minutes per day in employment and a reduction of 38 minutes per day in home production for women who were exposed to the HSA. This decline in home production is primarily on account of a reduction in women's engagement in domestic chores. Additionally, there is no change in time spent on leisure. These estimates show that women free up their time from home production due to increase in autonomy and allocate it to market work.

Granting equal inheritance rights to women has the potential to increase a woman's bargaining power, which further increases her ability to control her own earnings. This raises her gains from working in labor market and, therefore, affects her labour allocation decision. Women spending more time in socializing and less time in domestic chores and practicing religious activities hint that exposure to HAS reform might have indeed increased women's autonomy. In addition, the responsibility of home production of these newly powered women is being shared by the other household members of the family, especially by male members.

This paper reveals how policies that aim to promote gender equality and empower women can potentially impact women's time-use allocations in India where the deep-rooted patriarchal norms prevail. These deeply entrenched patriarchal norms emphasize women's primary role as homemakers and, thereby, restrict their mobility. Household work done by women is not viewed as worthy (Anderson and Eswaran, 2009). This paper highlights that in such a setup, gender-equal inheritance reform could be a form of reversal of the devaluing of women's domestic and reproductive labour. This could lead to women overcoming cultural barriers that come in the way of their seeking paid employment. It could help in breaking down stereotypes of gender roles that subordinate women and increases the stake that women have in their households and families.

References

Agarwal, B. (1994). *A Field of One's Own: Gender and Land Rights in South Asia*. Cambridge University Press.

Afridi, F., Dinkelman, T., and Mahajan, K. (2018). Why are fewer married women joining the workforce in India? A decomposition analysis over two decades. *Journal of Population Economics*, 31(3):783–818.

Afridi, F., Bishnu, M., & Mahajan, K. (2019). *What Determines Women's Labor Supply? The Role of Home Productivity and Social Norms* (No. 12666). IZA Discussion Papers.

Amaral, S. (2017). *Do improved property rights decrease violence against women in India?* ISER Working Paper Series, No. 2017-13.
Anderson, Siwan and Mukesh Eswaran (2009). What Determines Female Autonomy? Evidence from Bangladesh. *Journal of Development Economics,* 90: 179–191.

Atkin, D. (2009). Working for the future: Female factory work and child health in Mexico. *Unpublished Manuscript, Yale University*.

Anderson, S. & Genicot, G. (2015). Suicide and Property Rights in India. *Journal of Development Economics*, 114: 64–78.

Bahrami-Rad, D. (2021). Keeping it in the family: Female inheritance, inmarriage, and the status of women. *Journal of Development Economics*, *153*, 102714.

Behrman, J. R., Foster, A. D., Rosenweig, M. R., and Vashishtha, P. (1999). Women's schooling, home teaching, and economic growth. *Journal of Political Economy*, 107(4):682–714.

Bertrand, M., Kamenica, E., & Pan, J. (2015). Gender identity and relative income within households. *The Quarterly Journal of Economics*, *130*(2): 571-614.

Bernhardt, A., Field, E., Pande, R., Rigol, N., Schaner, S., and Troyer-Moore, C. (2018). Male social status and women's work. *AEA Papers and Proceedings*, 108: 363-67.

Bhalotra, S., Brulé, R., & Roy, S. (2020). Women's inheritance rights reform and the preference for sons in India. *Journal of Development Economics*, *146*, 102275.

Bose, N. and Das, S. (2017), Women's Inheritance Rights, Household Allocation, and Gender Bias. *American Economic Review: Paper & Proceedings*, 107(5): 150-153.

Calvi, R. (2020). Why are Older Women Missing in India? The Age Profile of Bargaining

Power and Poverty. *Journal of Political Economy*, 128(7): 2453-501.

Calvi, R., & Keskar, A. (2021). *'Til Dowry Do Us Part: Bargaining and Violence in Indian Families*. CEPR Discussion Papers, No. 15696.

Carranza, E. (2012). *Islamic Inheritance Law, Son Preference and Fertility Behavior of Muslim Couples in Indonesia*. World Bank Policy Research Working Paper No. 5972, The World Bank, Washington, DC.

Chiappori, P.A. (1988). Rational Household Labor Supply. *Econometrica*, 56: 63-90.

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

Deininger, K., Jin, S., Nagarajan, H. K., & Xia, F. (2019). Inheritance law reform, empowerment, and human capital accumulation: Second-generation effects from India. *The Journal of Development Studies*, *55*(12): 2549-2571.

Dinkelman, T. (2011). The effects of rural electrification on employment: New evidence from South Africa. *American Economic Review*, *101*(7): 3078-3108.

Doepke, M., & Tertilt, M. (2019). Does female empowerment promote economic development?. *Journal of Economic Growth*, *24*(4), 309-343.
Duflo, E. (2001). Schooling and Labor Market Consequences of School Construction in Indonesia: Evidence from an Unusual Policy Experiment. *American Economic Review*, 91(4): 795–813.

Duflo, E. (2003). Grandmothers and granddaughters: Old-age pensions and intrahousehold allocation in South Africa. *The World Bank Economic Review*, 17(1): 1-25.

Duflo, E. (2012). Women empowerment and economic development. *Journal of Economic Literature*, 50(4): 1051-79.

Dyson, T., & Moore, M. (1983). On kinship structure, female autonomy, and demographic behavior in India. *Population and Development Review*, 35-60.

Eswaran, M., Ramaswami, B., & Wadhwa, W. (2013). Status, caste, and the time allocation of women in rural India. *Economic Development and Cultural Change*, *61*(2): 311-333.

Field, E. (2007). Entitled to work: Urban property rights and labor supply in Peru. *The Quarterly Journal of Economics*, 122(4): 1561-1602.

Field, Erica, Rohini Pande, Natalia Rigol, Simone Schaner, and Charity Troyer Moore

(2016). On Her Account: Can Strengthening Women's Financial Control Boost Female Labor Supply? Working paper, Harvard University.

Gary, J. S. (1998). Divorce-law changes, Household Bargaining, and Married Women's Labour Supply. *The American Economic Review*, 88(3): 628-642.

Goldin, C. (1995). The U-shaped female labor force function in economic development and economic history. In Schultz, T., editor, *Investment in Women's Human Capital and Economic Development*. University of Chicago Press, Chicago.

Gupta, T., & Negi, D. S. (2021). *Daughter vs. Daughter-in-law: Kinship roles and women's time use in India* (No. 2021-002). Indira Gandhi Institute of Development Research, Mumbai, India.

Harari, M. (2019). Women's Inheritance Rights and Bargaining Power: Evidence from Kenya. *Economic Development and Cultural Change*, 68(1): 189-238.

Heath, R., & Tan, X. (2020). Intrahousehold bargaining, female autonomy, and labor supply: Theory and evidence from India. *Journal of the European Economic Association*, *18*(4): 1928-1968.

Hirway, I., & Jose, S. (2011). Understanding women's work using time-use statistics: The case of India. *Feminist Economics*, *17*(4), 67-92.

Hirway, I. (2012). Missing labour force: An explanation. *Economic and Political Weekly*, 47(37): 67-72.

Jain, T. (2014). Where there is a will fertility behavior and sex bias in large families. *Journal of Human Resources*, 49(2), 393-423.

Jayachandran, S. (2021). Social norms as a barrier to women's employment in developing countries. *IMF Economic Review*, 1-20.

Kannan, K. and Raveendran, G. (2012). Counting and profiling the missing labour force. *Economic and Political Weekly*, 47(6):77–80.

Maity, B. (2020), Consumption and Time-Use Effects of India's Employment Guarantee and Women's Participation. *Economic Development and Cultural Change*, 68(4): 1185-1231.

Mathur, A., & Slavov, S. (2013). Escaping domestic violence: Empowering women through employment, earnings and wealth in India. *American Enterprise Institute*.

McElroy, M. B., & Horney, M. J. (1981). Nash-bargained household decisions: Toward a generalization of the theory of demand. *International Economic Review*, 22(2): 333-349.

Mookerjee, S. (2019). Gender-Neutral Inheritance Laws, Family Structure, and Women's Status in India. *The World Bank Economic Review*, 33(2): 498-515.

Osili, U. O., & Long, B. T. (2008). Does female schooling reduce fertility? Evidence from Nigeria. *Journal of Development Economics*, *87*(1), 57-75.

Rosenblum, Daniel (2015). Unintended Consequences of Women's Inheritance Rights on Female Mortality in India. *Economic Development and Cultural Change*, 63: 223–248.

Roy, K. C., & C. A. Tisdell (2002). Property Rights in Women's Empowerment in Rural India: A Review. *International Journal of Social Economics*, 29(4): 315-334.

Roy, S. (2015). Empowering Women? Inheritance Rights, Female Education and Dowry Payments in India. *Journal of Development Economics*, 114: 233–251.

Quisumbing, A. R., & Maluccio, J. A. (2003). Resources at marriage and intrahousehold allocation: Evidence from Bangladesh, Ethiopia, Indonesia, and South Africa. *Oxford Bulletin of Economics and Statistics*, *65*(3): 283-327.

Thomas, D. (1990). Intra-household resource allocation: An inferential approach. *Journal of Human Resources*, 635-664.

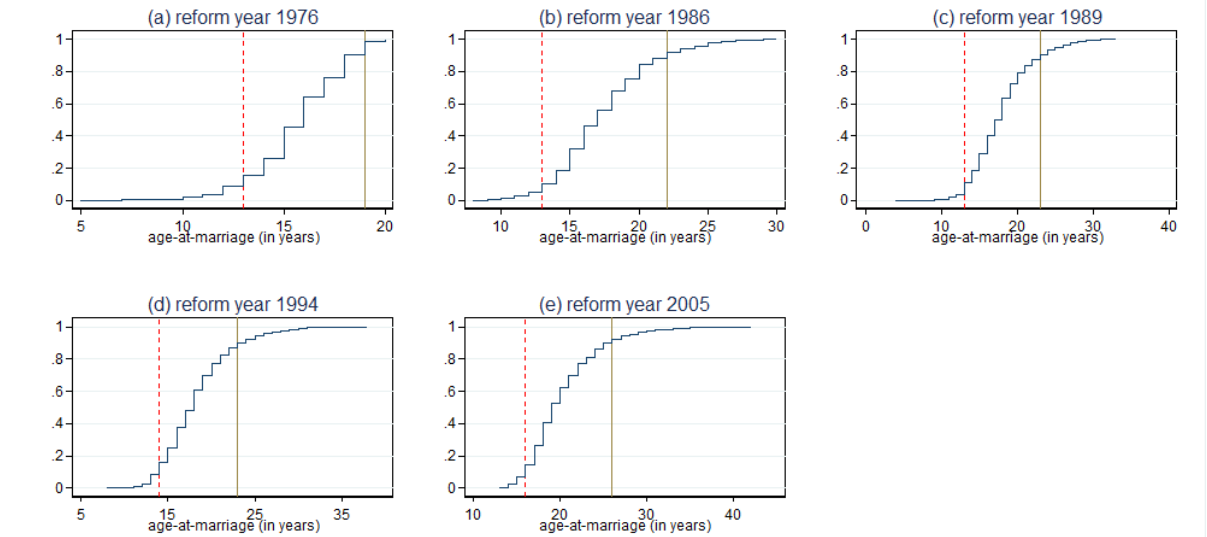
Wang, Shing-Yi (2014). Property Rights and Intra-Household Bargaining. *Journal of Development Economics*, 107: 192–201.

World Bank, 2012. *Gender equality and development.* World Development Report, 2012. Washington, DC: World Bank.

United Nations, 2015. *The World's Women 2015: Trends and Statistics*. New York: United Nations, Department of Economic and Social Affairs, Statistics Division.

Figures

Figure 1. Actual age-at-marriage distribution for different reform years



Note: The figure shows the age-at-marriage distribution for different reform years. The red and brown lines in each graph represent the 10th and 90th percentile of age-at-marriage, respectively. For example, the 10th percentile of marriage age in reform years 1976, 1986, 1989, 1994 and 2005 was 13, 13, 13, 14 and 16 respectively. Similarly, the 90th percentile of marriage age was 19, 22, 23, 23 and 26 respectively. The first four panels are state-specific distributions for each early reformer state corresponding to their respective reform year. The figure in the last panel is created using all the states except early reformer states (Kerala, Andhra Pradesh, Tamil Nadu, Karnataka, and Maharashtra).
Source: Author's calculation based on National Family Health Survey-3, 2005-06.

Tables

Table 1: Summary Statistics

	Hindu		Non-Hindu	
	Mean	SD	Mean	SD
Time spent per day (in minutes)				
Employment	71.391	156.816	46.191	127.897
Home production	381.98	159.82	402.518	162.917
Domestic Chores	325.94	139.884	329.494	138.406
Child care	54.271	86.83	70.943	97.327
Others' care	1.769	16.235	2.081	16.917
Leisure	953.327	160.65	957.331	156.816
Socialising	108.544	91.605	110.618	92.879
Religious Practices	14.714	29.704	31.252	56.382
Recreation	129.602	105.139	121.95	99.027
Self-care	700.468	108.885	693.51	107.943
Religion				
Hindu	0.965	0.183	0.000	0.000
Muslim	0.000	0.000	0.691	0.462
Christian	0.000	0.000	0.262	0.439
Sikh	0.022	0.144	0.000	0.000
Jain	0.003	0.058	0.000	0.000
Buddhist	0.010	0.099	0.000	0.000
Other	0.000	0.000	0.047	0.212
Other Characteristics				
Rural	0.637	0.481	0.577	0.494
Monthly per capita expenditure	2698.731	2313.696	2538.974	1791.94
Percent of hhs with young kid	0.202	0.401	0.185	0.389
Household size	1.393	0.414	1.434	0.412

Note: Sample includes the women who belong to 15-60 years old either belongs treated or control cohort in the sample estimation.

Table 2. HSA reform and married women's time use

VARIABLES	(1) Employment	(2) Home production	(3) Leisure	(4) Employment	(5) Home production	(6) Leisure
Treatedcohort × Hindu	45.717***	-41.850***	-9.375	40.056***	-37.635***	-6.503
	(10.807)	(8.353)	(7.869)	(10.553)	(8.070)	(7.735)
Treatedcohort	-4.865	34.005***	-12.118*	1.879	27.433***	-14.221**
	(10.319)	(10.798)	(7.204)	(9.492)	(9.913)	(7.044)
Observations	97,489	97,489	97,489	97,487	97,487	97,487
R-squared	0.331	0.433	0.413	0.342	0.440	0.418
FSU	Yes	Yes	Yes	Yes	Yes	Yes
Year of birth	Yes	Yes	Yes	Yes	Yes	Yes
Religion	Yes	Yes	Yes	Yes	Yes	Yes
Religion X Year of birth	Yes	Yes	Yes	Yes	Yes	Yes
Demographic Controls	No	No	No	Yes	Yes	Yes
Mean Dep Var	66.71	385.8	954.1	66.72	385.8	954.1

Note: The dependent variable in each column is the time spent in minutes per day in employment, home production, and leisure activities. The variable *Treatedcohort* is a dummy variable that takes values one and zero if the given woman is younger than the 10^{th} percentile and older than the 90^{th} percentile age of marriage distribution at the time of reform when it was passed in her respective state. The variable *Hindu* takes value one if the given woman religion as Hindus, Sikhs, Buddhists and Jains. All regressions include First stage unit or sub-region, religion and year of birth fixed effects as well as the religion-specific year of birth fixed effects. Standard errors are reported in parantheses and clustered at the district level.

Table 3. Types of Employment

VARIABLES	(1) Inside home	(2) Outside home	(3) Self	(4) Wage/ Salaried	(5) Agriculture	(6) Manufacturing	(7) Mining Construction	(8) Technical Services	(9) Non-technical services
Treatedcohort × Hindu	1.331	41.535***	5.834	31.622***	12.840***	6.701*	3.007	1.274	13.424*
	(3.211)	(9.546)	(5.537)	(7.857)	(4.711)	(3.491)	(2.667)	(3.131)	(6.973)
Treatedcohort	3.655	-1.614	6.265	-3.847	4.038	-0.219	0.163	4.781	-2.590
	(3.074)	(8.726)	(5.103)	(7.688)	(3.540)	(2.341)	(2.519)	(2.992)	(6.324)
Observations	97,487	97,487	97,487	97,487	97,487	97,487	97,487	97,487	97,487
R-squared	0.291	0.331	0.349	0.269	0.438	0.270	0.203	0.188	0.184

Note: The dependent variable in each column is the time spent in minutes per day in employment, home production, and leisure activities. The variable Treatedcohort is a dummy variable that takes values one and zero if the given woman is younger than the 10^{th} percentile and older than the 90^{th} percentile age of marriage distribution at the time of reform when it was passed in her respective state. The variable Hindu takes value one if the given woman religion as Hindus, Sikhs, Buddhists and Jains. All regressions include First stage unit or sub-region, religion and year of birth fixed effects as well as the religion-specific year of birth fixed effects. Standard errors are reported in parantheses and clustered at the district level.

Table 4: Heterogeneity

VARIABLES	(1) Employment	(2) Home production	(3) Leisure	(4) Employment	(5) Home production	(6) others
Panel a. Place of residence		**Rural**			**Urban**	
Treatedcohort × Hindu	47.057***	-33.317**	-16.320	35.828***	-46.593***	3.829
	(13.235)	(13.839)	(10.914)	(13.297)	(10.118)	(13.174)
Observations	61,037	61,037	61,037	36,417	36,417	36,417
R-squared	0.403	0.478	0.422	0.246	0.384	0.394
Panel b. Type of Family structure		**Nuclear**			**Joint**	
Treatedcohort × Hindu	41.310***	-27.680***	-16.094	58.289***	-58.622***	-3.907
	(10.799)	(6.697)	(10.091)	(16.601)	(16.869)	(12.695)
Observations	59,817	59,817	59,817	36,224	36,224	36,224
R-squared	0.411	0.541	0.481	0.410	0.486	0.500
Panel c. By wealth index		**Poor**			**Rich**	
Treatedcohort × Hindu	47.305**	-34.098**	-9.218	40.244***	-39.381***	-10.103
	(18.514)	(15.567)	(14.889)	(11.640)	(9.246)	(9.827)
Observations	53,350	53,350	53,350	42,155	42,155	42,155
R-squared	0.430	0.515	0.476	0.338	0.425	0.429
Panel d. By women's education level	**Less than secondary education**			**Secondary education and above**		
Treatedcohort × Hindu	26.181*	-22.039**	-4.321	64.748***	-55.009***	-20.025
	(13.854)	(10.855)	(11.154)	(18.414)	(12.827)	(13.736)
Observations	62,506	62,506	62,506	32,842	32,842	32,842
R-squared	0.443	0.509	0.477	0.309	0.450	0.456

Table 5. Mechanism: Individual components of home production and leisure

VARIABLES	(1) Domestic chores	(2) Child care	(3) Other care	(4) Socialising	(5) Religious practices	(6) Cultural	(7) Self-care
Treatedcohort × Hindu	-38.657***	0.958	0.063	6.418*	-20.699***	0.969	7.377*
	(6.757)	(3.288)	(1.230)	(3.882)	(3.891)	(5.514)	(4.070)
Treatedcohort	52.620***	-24.473***	-0.713	-11.589***	15.937***	1.432	-20.948***
	(8.679)	(3.756)	(1.050)	(3.799)	(3.378)	(4.261)	(3.735)
Observations	97,487	97,487	97,487	97,487	97,487	97,487	97,487
R-squared	0.407	0.446	0.164	0.431	0.400	0.496	0.510
Mean of Dependent Variable	326.6	57.36	1.827	108.9	17.78	128.2	699.2

Note: The dependent variable in each column is the time spent in minutes per day in domestic chores, child care, others' care, socialising, religious practices, recreation and self-care. The variable Treatedcohort is a dummy variable that takes values one and zero if the given woman is younger than the 10^{th} percentile and older than the 90^{th} percentile age of marriage distribution at the time of reform when it was passed in her respective state. The variable Hindu takes value one if the given woman religion as Hindus, Sikhs, Buddhists and Jains. Estimates in each column are from separate regressions. All regressions include First stage unit or sub-region, religion and year of birth fixed effects as well as the religion-specific year of birth fixed effects. Standard errors are reported in brackets and clustered at the district level.

Table 6. Mechanism: Intra-household Dynamics

	(1)	(2)	(3)	(4)	(5)
	Time spend to home production (minutes per day)				mechanical/outsource
	Boy (6-14)	Girl (6-14)	Men	Other women	(=1 if yes)
Treatedwomen × Hindu	2.423***	4.562***	17.752***	12.647**	-0.005
	(0.686)	(1.541)	(4.646)	(5.647)	(0.003)
Treatedwomen	-2.279***	-7.232***	-4.934	-281.202***	0.001
	(0.683)	(1.512)	(4.443)	(5.671)	(0.003)
Observations	97,487	97,487	97,487	97,487	97,487
R-squared	0.177	0.148	0.282	0.553	0.502

Note: Standard errors are reported in brackets and clustered at the district level.

Table 7: Evidence from Panel Data

	All four states			Only Tamil Nadu		
	(1)	(2)	(3)	(4)	(5)	(6)
	Employment	Home production	Leisure	Employment	Home production	Leisure
Exposed to reform	30.535**	-120.647***	36.060***	83.499***	-195.716***	65.583***
	(13.420)	(19.239)	(10.458)	(15.784)	(19.200)	(11.884)
Observations	45,132	45,132	45,132	12,817	12,817	12,817
R-squared	0.155	0.253	0.153	0.134	0.297	0.084

Note: Standard errors are reported in brackets and clustered at the district-survey year level.

Appendix

Appendix A

(A) Construction of age-at-marriage distribution

To find the actual age-at-marriage distribution for different reform years, I use the nationally representative National Family Health Survey-3 (NFHS-3) conducted in 2004-05. NFHS-3 collects detailed information covering the sample of 109,041 households with 74,369 men of age 15-54 and 124,385 women of age 15-49. It covers 99 percent of India's population. The NFHS data contains information on women's age at marriage and year of marriage along with individual, household and other demographic characteristics. Since the Time Use Survey 2019 does not contain any information on women's age at marriage, I use NFHS-3.
I use two variables from NFHS-3 to construct the age-at-marriage distribution: (a) age at first marriage (*v511*) and (b) year of marriage (*v508*). Next, I take the sample of all the women who get married in a particular year across India and, then use their age at first marriage to create the age-at-marriage distribution for that particular year. This has been done separately for all the five years when the amendments were made. The actual distribution for age-at-marriage distribution in each reform year is given in Figure 1. This shows that the 10th percentile of age-at-marriage distribution for the years 1976, 1986, 1989, 1994 and 2005 is 13, 13, 13, 14 and 16 respectively. Similarly, the 90th percentile of age-at-marriage distribution for the years 1976, 1986, 1989, 1994 and 2005 is 19, 22, 23, 23 and 26 respectively.

(B) Construction of treated and control cohort

For this, I calculate the age-at-reform for each sampled women in Time Use Survey 2019 and use the threshold from NFHS to define treated and control cohort. I do this in three steps. Following example will explain these three steps.
Step 1. First, I take thresholds for each reform year from NFHS-3. For example, reform came in Andhra Pradesh in year 1986. The thresholds for year 1986 are $\underline{c}$ = 13 and $\overline{c}$ = 22.
Step 2. In TUS sample, I calculate the age-at-reform for each woman as follows:

age-at-reform = current age - (survey year - reform year)

Step 3. In the last step, I compare age-at-reform with thresholds and classify treated cohort on the basis of following rule:

$$Treatedcohort = \begin{cases} 1 \; if \text{ age-at-reform} < \underline{c} \\ 0 \; if \text{age-at-reform} > \overline{c} \end{cases}$$

For example, for women residing in Andhra Pradesh: if a given woman age-at-reform is less than 13 years, then she is classified into treated cohort and if her age-at-reform is more than 22 years, then she is classified into control cohort. Similarly, I do this separately for all women residing in different states using thresholds of the year in which reform came

Appendix B

Table B1. List of Activities

Category	Activities
Employment	Employment in corporations, government and non-profit institutions; Employment in household enterprise to produce goods and to provide services; Ancillary activities, training and studies related to employment; Setting up a business
Domestic Chores	Food and meals preparation; Cleaning and maintaining own house, clothes and footwear; Household management like paying bills, budgeting; Petcare; Shopping for other household members
Child chare	Feeding, cleaning, providing medical care, teaching, training, playing and minding children
Others' Care	Care and help provided to dependent and non-dependent adult household members
Socialising	Chatting with others; attending get-togethers; participating in community cultural and social events (non-religious) like weddings, funerals, births etc.
Religious practices	Private prayers and meditation; Participating in collective religious activities
Recreation	Visiting cultural events, parks and sports events; Reading and watching television; Playing games and exercising; Arts, Literary and Music
Self-care	Sleep, Eating and drinking, personal hygiene and care including medical care

Source: Time Use Survey, 2019

Table B2. Falsification Tests

	(1) Employment	(2) Home production	(3) Leisure
Panel A. Arbitrary creating treated cohort on women not exposed to reform			
TreatedcohortNew X Hindu	13.135	-8.067	-4.545
	(12.865)	(9.612)	(15.847)
Observations	39,841	39,841	39,841
R-squared	0.452	0.484	0.501
Panel B. Sample of married men			
TreatedcohortMen X Hindu	15.357	-4.346	-9.800
	(12.647)	(4.088)	(11.742)
Observations	80,504	80,504	80,504
R-squared	0.407	0.301	0.350
Panel C. Arbitrarily asigning reform states			
Treatedcohort X Hindu	-24.495*	14.462	8.263
	(14.263)	(10.895)	(13.686)
Observations	95,674	95,674	95,674
R-squared	0.349	0.449	0.418

Note: The dependent variable in each column is the time spent in minutes per day in employment, home production, learning and leisure activities. The variable Treatedcohortnew is a dummy variable that takes value 1 if women who were older by 13 years or fewer than 90th percentile of the age at marriage distribution at the time of reform in her state and 0 if women who were older by 14 years or more than 90th percentile of the age at marriage. The variable Treatedcohortmen is a dummy variable that takes values one and zero if the given man is younger than the 10th percentile and older than the 90th percentile age of marriage distribution at the time of reform when it was passed in her respective state. The variable Hindu takes value one if the given woman religion as Hindus, Sikhs, Buddhists and Jains. Estimates in each column are from separate regressions. All regressions include First stage unit or sub-region, religion and year of birth fixed effects as well as the religion-specific year of birth fixed effects. Standard errors are reported in brackets and clustered at the district level.

Table B3. 10-year wide cohort and considering only early reform states

	10-year long cohort			Only early reformer states		
	(1)	(2)	(3)	(4)	(5)	(6)
	Employment	Home production	Leisure	Employment	Home production	Leisure
Treatedcohortshort ×Hindu	34.075**	-31.642***	-9.527			
	(13.419)	(8.876)	(11.973)			
Treatedcohort × Hindu				39.095***	-37.137***	-5.731
				(14.576)	(13.958)	(13.898)
Observations	70,623	70,623	70,623	28,604	28,604	28,604
R-squared	0.398	0.481	0.446	0.322	0.399	0.376

Note: The dependent variable in each column is the time spent in minutes per day in employment, home production and leisure activities. The variable Hindu takes value one if the given woman religion as Hindus, Sikhs, Buddhists and Jains. In columns (1), (2) and (3), the variable Treatedcohortshort is a dummy variable that takes values one and zero if the given woman is younger (by 10 years or fewer) than the 10^{th} percentile and older (by 10 years or fewer) than the 90^{th} percentile age of marriage distribution at the time of reform when it was passed in her respective state. Regressions in columns (4), (5) and (6) are only on the subsamples of states who amended the reform early like undivided Andhra Pradesh, Karnataka, Tamilnadu, Maharashtra and Kerala. Estimates in each column are from separate regressions. All regressions include First stage unit or sub-region, religion and year of birth fixed effects as well as the religion-specific year of birth fixed effects. Standard errors are reported in brackets and clustered at the district level.

Table B4. Robustness checks

	(1) Employment	(2) Home production	(3) Leisure
(A) Inclusion of religion-time trends			
Treatedcohort × Hindu	25.840***	-30.443***	2.292
	(6.707)	(5.830)	(5.647)
Observations	97,513	97,513	97,513
R-squared	0.329	0.428	0.398
Religion time trends	Yes	Yes	Yes
(B) Inclusion of state-time trends			
Treatedcohort × Hindu	30.616***	-20.143***	-8.793
	(10.138)	(7.240)	(7.883)
Observations	97,487	97,487	97,487
R-squared	0.344	0.444	0.420
State time trends	Yes	Yes	Yes
(C) IHS Transformation			
Treatedcohort × Hindu	0.662***	-0.111**	-0.010
	(0.147)	(0.050)	(0.009)
Observations	97,487	97,487	97,487
R-squared	0.359	0.252	0.419
Mean of Dependent Variable	1.266	6.453	7.540
(D) Alternative clustering			
Treatedcohort × Hindu	40.056***	-37.635***	-6.503
	(14.250)	(13.813)	(7.631)
Observations	97,487	97,487	97,487
R-squared	0.342	0.440	0.418

Note: The dependent variable in each column is the time spent in minutes per day in employment, home production, and leisure activities. The variable Treatedcohort is a dummy variable that takes values one and zero if the given woman is younger than the 10^{th} percentile and older than the 90^{th} percentile age of marriage distribution at the time of reform when it was passed in her respective state. The variable Hindu takes value one if the given woman religion as Hindus, Sikhs, Buddhists and Jains. Estimates in each column are from separate regressions. All regressions include First stage unit or sub-region, religion and year of birth fixed effects as well as the religion-specific year of birth fixed effects. Standard errors are reported in brackets and clustered at the district level.