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Keeping it in the family: Female inheritance, inmarriage, and the status of women☆

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ABSTRACT

While female property ownership is associated with positive outcomes for women, their right to inherit property in patrilineal societies may also result in more constraining marriage norms. I test the following hypothesis: Where a woman inherits property, her male relatives are more likely to arrange her marriage to a cousin in order to keep her share of property within the male lineage. The increase in unearned income due to female inheritance also reduces women's economic participation, especially in blue-collar jobs where women's work is subject to social stigmas. Using a difference-in-differences design that exploits exogenous variation induced by a reform of inheritance laws in India in 2005, the study finds that women exposed to the female inheritance law are more likely to marry their paternal cousins and less likely to work, especially in agriculture. The paper also discusses possible implications for the evolution of marriage and gender norms in Islamic societies, where female inheritance is mandated by Islamic law.

> "This is what the LORD commands … Every daughter who inherits land in any Israelite tribe must marry someone in her father's tribal clan, so that every Israelite will possess the inheritance of his fathers".
>
> (The Bible, Numbers 36: 6–8)

1. Introduction

Much of the economics literature argues that granting women rights to inherit property empowers women, increases their autonomy, and promotes gender equality (see, e.g., Deininger et al., 2013; Roy, 2015; Heath and Tan, 2020; Anderson, 2018). However, historical evidence suggests that female inheritance may also result in the imposition of constraining marriage and gender norms on young women if it is not accompanied by actual property ownership.

In the modern world, women's inheritance rights enable them to control and exploit their property and therefore improve their social and economic prospects. But, in a patrilineal society, female inheritance transmits property through women, not to women. Here, women function mainly as carriers of property from father to husband, and on to children, rather than as active managers of wealth (Goody, 1976; Korotayev, 2000; Jain, 2014). Therefore, a woman's inheritance belongs to her husband's lineage. This gives her male relatives an interest in arranging her marriage within their lineage. Female inheritance also increases women's unearned income. As a result, and under social stigmas of traditional societies towards women holding manual jobs (Goldin, 1994), they might prefer spending time on domestic activities.

In this paper, I empirically assess these long-standing theories. I suggest that under female inheritance, patrilineal societies encourage cousin marriage and discourage women's economic participation. In a difference-in-differences analysis using a policy reform on inheritance laws in India in 2005, I provide evidence that female inheritance

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increases the cousin marriage rate and lowers the female economic participation rate.

Presenting a simple conceptual framework, I propose two hypotheses. As the unit of analysis, I consider a patrilineal lineage consisting of male blood relatives who trace their paternal line to a common male ancestor. Female offspring are considered members only of their family of marriage. Therefore, a daughter's share of inheritance belongs to the husband's lineage. The objective of the lineage is to maximize the stream of future agricultural outputs produced from landholdings. Land markets are absent or imperfect, so the exchange of parcels of land is impossible.

The first hypothesis suggests that when women are included in inheritance, cousin marriage is more frequent. The lineage arranges the marriage of a female offspring to her father's brother's son in order to preserve her share of property in the male line and pool land parcels within the lineage. Therefore, the lineage benefits from economies of scale in agricultural production. Due to absent or imperfect capital markets, exchange of parcels of land is impossible. Therefore, marriage arrangement with outsiders will lead to non-contiguous parcels of land, sacrificing economies of scale.

The second hypothesis is that female inheritance reduces female economic participation. Inheriting property increases a woman's lifetime unearned income. Therefore, according to standard economic theories, it is expected to reduce her labor supply. Due to social stigmas against women working outside the home in patrilineal societies, women work on manual jobs such as agriculture only at low levels of income and as secondary workers of the family. An unearned income allows them to withdraw from the labor market and focus on domestic work. Therefore, the income effect of female inheritance and the decline in labor supply is larger for women working in blue-collar jobs such as agriculture.

In the empirical section, I use the amendment of the Hindu Succession Act (HSA) in 2005 in a difference-in-differences approach to provide evidence of the causal impact of female inheritance on in-marriage and female economic participation. The HSA applies only to Hindus, and explicitly exempts Muslims and Christians. Therefore, it substantially improved Hindu women's inheritance rights on ancestral land. Using data from the Indian National Family Health Surveys, I show that the marriage to blood relatives was significantly higher and the economic participation rate was significantly lower in the treated group, that is, Hindu women married in or after 2005.

I then focus on components of the two outcome variables. Consistent with the conceptual framework of the study, being exposed to the amendment significantly increases marriage to paternal first cousins but not maternal first cousins. The analyses with components of female economic participation also show that the reduced female economic participation is mainly due to the decline in working in the agriculture versus the non-agriculture sector. The findings are in line with evidence from developing countries that with increased bargaining power, women in traditional sectors prefer leisure or home production to working in the market (Cameron et al., 2001; Afridi et al., 2018). I provide placebo tests and event studies of outcome variables and their components. The results confirm the identical counterfactual trends of main outcome variables (i.e., paternal cousin marriage and working in agriculture) for treatment and control groups. I also present additional tests and robustness checks.

Economic empowerment of women in developed countries increases their control over decisions and their bargaining power within the household; it also creates positive outcomes such as reduced domestic violence against women (see, e.g., Aizer, 2010; Anderberg et al., 2016). However, it is not clear whether policies designed to empower women in developing countries always have a similar effect. Some studies show positive outcomes for women (Deininger et al., 2013; Mathur and Slavov, 2013; Harari, 2014; Roy, 2015; Heath and Tan, 2020; Amaral, 2017; Anderson, 2018). Others report unintended negative consequences, such as increased female child mortality (Rosenblum, 2014), son preference (Bhalotra et al., 2020), and domestic violence and suicides (Chin, 2012; Anderson and Genicot, 2015; Ericsson, 2019).

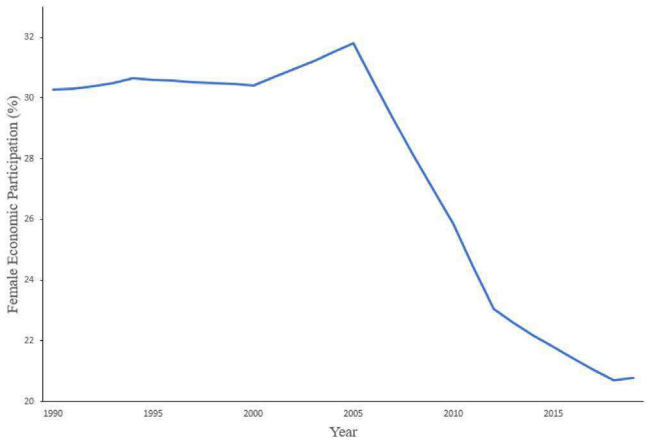

Fig. 1. Labor force participation rates of Indian women, measured by proportion of women ages 15 and older that is economically active.
Source: International Labour Organization.

The findings of this study contribute to our knowledge of marriage and the status of young women in developing countries and highlight potential unintended consequences of exogenously introduced policies to improve female inheritance under patrilineal restrictions on actual property ownership by women. The findings might partly explain the puzzle of the recent decline in female economic participation rates in India, as shown in Fig. 1. In a discussion at the end of the paper, I also suggest that the findings might have important implications for the evolution of norms encouraging cousin marriage and the seclusion of women in Islamic societies where Sharia has mandated female inheritance.

The paper is organized as follows. Section 2 introduces various inheritance systems and discusses their origins and persistence. Section 3 develops a conceptual framework for analyzing the effect of female inheritance on cousin marriage and female economic participation. Section 4 provides background on the Hindu Succession Act of India and discusses obstacles for the amendment to improve the actual property ownership by women. Section 5 presents the data, variables, and identification strategy. Section 6 provides results from regression analyses. Section 7 discusses additional tests and robustness checks. Finally, Section 8 summarizes the study and presents a discussion on its possible implications.

2. Background

Social scientists discuss marriage practices and the status of women in the larger context of kinship patterns, for which inheritance is considered an important determinant.[1] Anthropological studies clearly show that inheritance can affect marriage patterns, residence arrangements, family structures, patriarchy, courtship and sex, kinship terminology, and so on.[2] To understand why the link between inheritance

[1] Max Weber perceived a kin group as "a group of expectant heirs" (Weber, 1978, p. 365). Lewis Morgan argued that the family grew out of the development of a knowledge of property and its transmission by inheritance, and that even in the face of other factors, "with more effective power the rights of property might influence the system of relationship" (Morgan, 1871, p. 14). Jack Goody noted that inheritance is an institution "in which interpersonal relationships are structured" (Goody, 1976, p. 1). David Sabean suggested that "there is no system of obligations and duties" that is not mediated through property (Sabean, 1984, p. 171).

[2] See, e.g., Morgan (1871), Dole (1965), Berkner (1972), Goody et al. (1976), Medick (1976), Medick and Sabean (1984), Smith (1984), Segalen

and kinship is important, we need to consider the institutional environment of pre-industrial societies and many contemporary developing countries. In pre-industrial agricultural societies, which were characterized by imperfect capital markets (Chu, 1991), land as the basic source of wealth and means of production was universally transmitted between close kin by the process of inheritance (Goody, 1969; Smith, 1984). Even today in many developing countries, land sales are rare, and most land is acquired through inheritance as a non-market mechanism (Platteau and Baland, 2001; Jain, 2014). It is not surprising that in such a world, "kinship and property are closely interlocked" (Goody, 1969, p. 70). In this section, I will introduce different inheritance systems, and discuss their origins and persistence.

2.1. Classification of inheritance systems

It is important first to define what I refer to as "inheritance systems". Inheritance systems are usually classified using combinations of possible modes of property transmission. The first dimension involves lineal versus lateral inheritance systems. In lineal inheritance systems, property is transmitted vertically to children. In lateral inheritance systems, property is transmitted horizontally to siblings or indirectly vertically to siblings' children. The second dimension involves impartible versus partible inheritance systems. In impartible inheritance systems, a land parcel is preserved intact from generation to generation, and only one lineal or lateral heir inherits property. The examples are primogeniture (inheritance by a senior child, sibling, or sibling's child) and ultimogeniture (inheritance by a junior child, sibling, or sibling's child). In partible inheritance systems, the land parcel is not preserved intact. Instead, each parcel is divided up lineally or laterally among some or all of the children, siblings, or siblings' children. The third dimension involves female inclusion versus female exclusion in inheritance.

To see how different inheritance systems can be characterized by the combinations of these three categories, consider the following historical examples.[3] Primogeniture, in practice carried out by preference given to the senior son—found in Japan, Korea, and northwest Europe—can be characterized as lineal and impartible, with female exclusion. The inheritance system of equal division of land property among sons—common in eastern Europe, Russia, China, and South Asia—can be characterized as lineal and partible, with female exclusion. Dividing inheritance among all sons and daughters—common in Mediterranean Europe, Latin America, and Islamic societies—can be characterized as lineal and partible, with female inclusion. A lateral inheritance system was common in Africa south of the Sahara. In theory, this system could be partible or impartible, and with female inclusion or exclusion. But in practice, lateral inheritance in sub-Saharan Africa excluded women (Goody, 1976). The mode of property transmission can also be characterized by the absence of any rules of inheritance or any private property rights, such as in hunter–gatherer or communal societies. Using data from the Ethnographic Atlas (Murdock, 1962–1971; Kirby et al., 2016), Fig. 2 displays pre-industrial inheritance systems around the world, which coincide with the historical examples mentioned above.[4]

2.2. Origins and persistence of inheritance systems

The differences between inheritance systems are thought to be deep-rooted in agricultural and political organization. Capital-intensive (e.g., involving plows), open-field, and manorial agriculture might favor impartible inheritance due to economies of scale. However, agricultural organization itself is determined by geographic factors and political organization. For example, heavy soils usually required large plows pulled by several horses, which were expensive and practical only on large land holdings, while sandy light soils could be cultivated by handheld tools like the hoe and digging stick on small family farms. In terms of political organization, manorial agriculture, for example, was closely linked to feudalism (Platteau and Baland, 2001).

Despite the influence of agriculture, the literature suggests that inheritance systems are best explained by the political organization of societies. In societies with impartible inheritance, such as Japan or northwest Europe, lands were controlled by powerful nobility whose interests were best served by maintaining their holdings intact through impartible inheritance because the political and military functions associated with the estate were indivisible (Smith, 1776; Platteau and Baland, 2001; Beckert, 2008). Also, in European countries, large estates came with seats on parliamentary bodies. Therefore, property became indivisible because the office was indivisible (Beckert, 2008).

On the other hand, a necessary condition for partible inheritance was a strong central government (Alston and Schapiro, 1984). In places such as China, India, Russia, and the Mediterranean, inheritance rules were subject to the legislation of strong central bureaucracies with an interest in restricting the development of powerful landholding families by fragmenting their properties through partible inheritance (Wittfogel, 1959; Goldschmidt and Kunkel, 1971; Platteau and Baland, 2001; Kuran, 2012). But contrary to patrilineal partible inheritance in China, India, and Russia, partible inheritance in the Mediterranean region (including the Middle East) included both sons and daughters. The inclusion of women in inheritance in the Mediterranean region had Roman-Byzantine roots (Kaser, 2003).

Again, it seems that geographic factors had a role here. For example, Wittfogel (1959) suggests that in regions such as the Middle East, states had centralized power by controlling large-scale irrigation systems essential to the agriculture. Bentzen et al. (2015) provide general evidence on this account. Michalopoulos et al. (2016, 2017) argue that a centralized Islamic state featuring redistributive principles such as partible inheritance emerged to address economic inequalities resulting from geographic features of the region—that is, unequal agricultural potential with few fertile places and a large share of arid lands—and their interaction with the diversion of trade routes in seventh-century Arabia.

Whatever the deep-rooted sources are, once they determine the form of an inheritance system, its development "very much tends to follow the track that has been laid down, and is relatively independent of changing socio-economic conditions" (Beckert, 2008, p. 82). One can find a strong continuity and a systematic pattern through all changes (Goody et al., 1976; Beckert, 2008). Two important aspects of inheritance contributed to its persistence and path dependency. First, inheritance practices cannot be understood as purely individual decisions. Rather, they are regulated by secular or religious institutions and laws. Inheritance laws frequently "continue in force long after the circumstances which first gave occasion to them" (Smith, 1776, p. 305). Second, inheritance is a non-market institution (Platteau and Baland, 2001; Beckert, 2008).

For example, primogeniture was legally recognized through *entails*,[5] which were "respected through the greater part of Europe" (Smith, 1776, p. 384). By entail, the testator not only determined the heir, but also decided to whom the land must be bequeathed after the death

(1986), Goldstein (1987), Korotayev (2000), Heady and Grandits (2003), Shenk et al. (2016).

[3] The examples are drawn from Nakane et al. (1967), Goldschmidt and Kunkel (1971), Thirsk (1976), Platteau and Baland (2001), Kaser (2003), Mitterauer (2003), Beckert (2008)

[4] The Ethnographic Atlas focuses on the characteristics of the sample of societies prior to European contact. Hence it obviously provides scant observations for western Europe. However, based on detailed studies and data on Europe, we know that impartible inheritance was more common in northwest Europe than any other region in Eurasia (Thirsk, 1976; Todd, 1990; Platteau and Baland, 2001; Beckert, 2008). Description of variables used in the map are available upon request.

[5] *Fideikommiss* (in German), *substitutions* and *majorats* (in French).

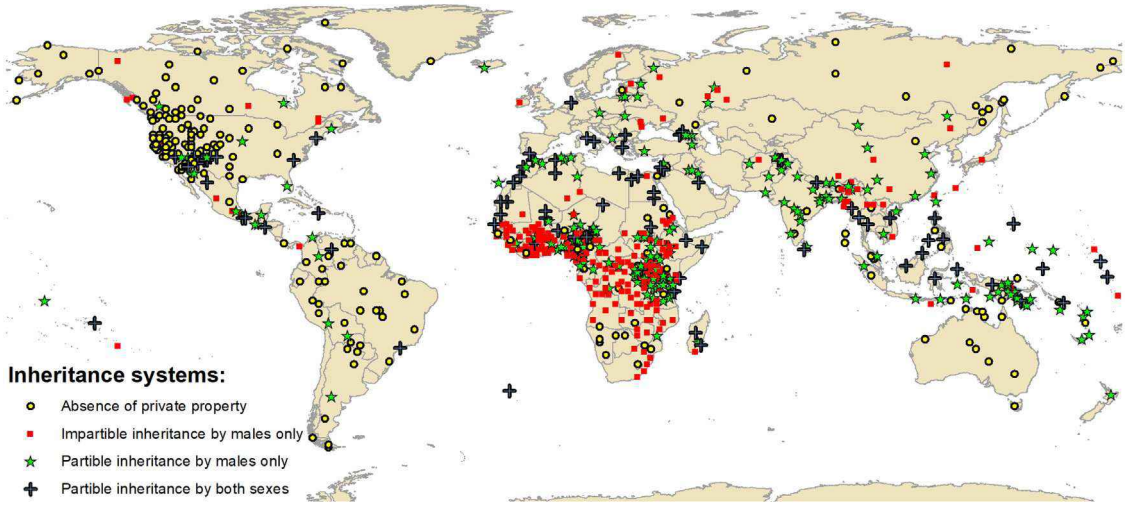

Fig. 2. Inheritance systems of pre-industrial societies from the Ethnographic Atlas, distinguishing *impartible* and *partible* inheritance systems, and for the latter, distinguishing *female inclusion* and *female exclusion* in inheritance.

of the heir. If real property was entailed, it could not be sold by the heir, and it had to be passed on automatically from generation to generation according to the succession determined by the founder. Entails prevented the division of property through sale or inheritance. Therefore, an entailed property was removed from the market process. Aside from enjoying legal recognition for centuries—until 1780 in the United States, 1848 in France, 1919 in Germany, and 1925 in Britain (Beckert, 2008)—supporters of primogeniture collected more than a dozen biblical verses to give it a Christian foundation (Kuran, 2012). Under strict manorial controls in Europe, even peasants had no right to divide or alienate the land (Platteau and Baland, 2001; Kaser, 2003).

In contrast, inheritance has been subject to the partible Qur'anic inheritance law in Islamic societies (Kuran, 2012). Islamic inheritance law clearly subordinated personal preferences and strengthened the inheritance rights of women.[6] The law took shape in the Mediterranean Middle East region, in Syria and Iraq, which were already accustomed to partible inheritance practices and inclusion of women. However, by entering into the text of the Qur'an, the law became a path-dependent institution for all populations that were introduced to Islam through conquests. Although some Muslim populations attempted to exclude women from inheritance, they were still more likely to inherit than their counterparts in Christian societies because the Qur'an left no space for different interpretations regarding female inheritance (Brunnbauer, 2003).

Finally, communal and joint property persists in many developing countries. Under these "archaic regimes" (Ostrom and Hess, 2000), access to land is possible only through membership in a communal assembly or a joint family composed of several generations, and a single member can hardly transfer or alienate their membership right. Thus, land sales and partitions are rare (Ostrom and Hess, 2000; Jain, 2014; Casari and Lisciandra, 2016).

Due to its deep-rooted origins and its persistence, inheritance is a process critical to the reproduction of the social system itself. It is true that the differences in inheritance systems were a marked feature of the pre-industrial era. But, as Goody et al. (1976) argued, "whatever the reasons, these differences have consequences for the position of women, the structure of social roles, the behavior of kin, and the strategies of family organization" (p. 35).

3. Conceptual framework

To guide my analyses, here I present a simple conceptual framework with supporting evidence from the literature and surveys. I base my arguments on inheritance of land only, both for the sake of clarity and because land was historically the most important form of property, factor of production, and source of wealth. However, my arguments may well apply to other property such as herds or commercial property.

Lineage. A lineage is a corporate kinship group consisting of male blood relatives who trace their paternal line to a common male ancestor. Daughters (and their children) are considered only members of their family of marriage, a norm typical to many patrilineal societies such as India (Henrich, 2015; Jain, 2014). Therefore, a daughter's share of inheritance belongs to the husband's lineage.

Analogous to a corporation, a lineage outlasts its current members and aims to achieve a collective goal by sustaining cooperation among members and regulating interactions with non-members, the market, and the state (Greif and Tabellini, 2017). Patrilineal organization of lineages has evolved to create non-overlapping membership and an unambiguous group identity to solve collective action and coordination problems (Strassmann and Kurapati, 2016).

Institutional constraints. First, there are two inheritance regimes: one in which only males have inheritance rights, and one in which males and females enjoy equal inheritance rights. Second, land markets are absent or imperfect, a characteristic typical of pre-industrial societies and many developing countries such as India (Chu, 1991; Platteau and Baland, 2001; Jain, 2014). Therefore, exchange of parcels of land is either impossible or very costly, which impedes consolidation of non-contiguous parcels of land owned by a family.

Technological constraints. First, land is a factor of production. Second, there are economies of scale in production. Therefore, non-contiguous parcels of land yield lower production compared with an intact land of the same size.

There is large body of literature on the productivity effects of land fragmentation. The evidence from developing countries such as India confirm that land fragmentation indeed sacrifices economies of scale (Deininger et al., 2017; Adamopoulos and Restuccia, 2020). Economies of scale could arise for the following reasons. First, some

[6] Verses 11, 12, and 176 in the fourth chapter of the Qur'an, Surah An-Nisa. Islamic inheritance law limits an individual's power of testamentary disposition to one-third of his estate, and two-thirds of the estate passes to the legal heirs of the deceased under the compulsory rules of inheritance. Legal heirs include children, spouses, parents, and siblings of both sexes. The females among these relatives take only half the share of the male relative of the same degree of relation to the decedent. However, a female must have her firm share of inheritance in all types of property left by her father.

forms of agricultural technologies such as plowing and harrowing require larger land parcels (Platteau and Baland, 2001). Second, some agricultural tasks such as irrigation, drainage, and pest control involve large fixed costs per parcel. Third, non-contiguous plots require more labor time to travel, supervise crops and transport inputs between plots (Simons, 1985). Finally, larger land parcels might be associated with better access to credit (Feder and Onchan, 1987) and more political and bargaining power (Smith, 1776; Beckert, 2008; Platteau and Baland, 2001).

Objective function. Analogous to a corporation, the objective of the lineage is to maximize the present value of future benefits from the capital (Brealey et al., 2019), that is, the discounted stream of indefinite future agricultural outputs produced from the lineage's landholdings. This improves the lineage's chance of survival by providing better nutrition, hygiene, and health (Chu, 1991). Since production is a function of land and subject to economies of scale, the objective translates to preserving contiguous parcels of land within the male line.

The objective is fulfilled through internalized norms of lineage members who make marriage decisions for their children accordingly. The norms are usually reinforced by a patriarch or lineage leader. The objective is implicit in many historical and anthropological records. Adam Smith (1776), for example, describes attempts of European families to hinder any part of the estate from being carried out of the male line. Observing families in contemporary India, Agarwal (1998) notes how heads of families aim to retain land among male descendants. There are similar accounts from other patrilineal societies as well (see, e.g., Nakane et al., 1967; Chu, 1991; Kertzer, 1993; Cole and Wolf, 1999; Gabaccia and Iacovetta, 2002; Colclough, 2003; Abbott, 2013).

Marriage choice. The lineage needs to choose between inmarriage and outmarriage. In case of inmarriage, female offspring marry members of the male lineage such as a father's brother's son. In case of outmarriage, however, male and female offspring marry outsiders such as strangers or maternal cousins.

Considering the above conceptual framework, let us now see how exclusion and inclusion of women in inheritance impacts the marriage choice in the above framework. With no female inheritance, a father is indifferent regarding whom his children marry, because the land will remain within the male lineage. With female inheritance, however, a father marries his daughter to his brother's son to keep her share of inheritance within the lineage.

Fig. 3 depicts a simple segment of a lineage consisting of two brothers who own contiguous parcels of land, and each has a daughter and a son. In case of no female inheritance in chart (a), independent of whether the children marry outsiders or within the lineage, the land parcel of each male member is transferred to his son and remains intact within the lineage. The next charts show the case with female inheritance, chart (b) with outmarriage and chart (c) with inmarriage. In chart (b), marriage of daughters to outsiders means that their shares of land leave the male lineage. Therefore, the land in possession of the lineage in the next generation is halved. This will reduce the stream of future outputs for the lineage. In chart (c), every daughter marries her father's brother's son. Therefore, they are considered members of the lineage, and their share of land belongs to the lineage. The cousin marriage provides the possibility for pooling parcels of land in the new conjugal estate of the cousin married couple. The size of the land in possession of the lineage does not change across generations, and in fact, is the same as in chart (a) where there was no female inheritance at all.

Therefore, whenever female inheritance is the rule, maximizing the stream of future agricultural outputs of the male line, and therefore preserving contiguous parcels of land within the lineage, requires arranging the marriage of a daughter to her father's brother's son. But what if an outsider woman marrying the son also inherits a parcel of land from her father? Under the assumption of absent/imperfect land markets, exchanging parcels of land, and therefore pooling non-contiguous land parcels is impossible or very costly. Thus, the production of the lineage will decrease due to lower productivity of farming on non-contiguous land parcels. Considering the efficiency costs, a female partner with a plot of land within the lineage is considered a better candidate to preserve the property of the male lineage than an outsider female with the same size and quality of land plot.

Avoiding fragmentation of land by the means of inmarriage is well documented in the literature (see, e.g., Goody et al., 1976; Korotayev, 2000; Heady and Grandits, 2003; Cavalli-Sforza et al., 2004; Shenk et al., 2016). The evidence from developing countries also confirms the link. For example, around 20% of cousin-married respondents in Pakistan and Bangladesh (both Muslim countries with female inheritance laws) state that fragmentation of the property is the reason behind their cousin marriage (Mobarak et al., 2019).

There are a few points to note here. First, the above setup encourages marriage of a daughter to her father's brother's son, a paternal first cousin, to maintain her share of land within the male line. However, this is not the case for marriage of the daughter to maternal first cousins (i.e., mother's brother's son and mother's sister's son). Since maternal cousins belong to lineages other than the father's lineage, marriage to them will diffuse a daughter's share of land out of the father's lineage.

Second, lineages often include more distant male relatives. Therefore, attempts to keep the land within extensive lineages could also lead to marriage between remote cousins such as second cousins. Third, as long as the lineage is able to arrange the marriage of all daughters with eligible partners within the lineage, there is less incentive to exert control over the marriage of remaining male members. A son's share of inheritance belongs to the male lineage even if he marries an outsider with a contiguous parcel of land. This is not the case for daughters: a daughter's marriage to any outsider diffuses the land out of the lineage. Therefore, men have on average more freedom in their marriage choices.

Fourth, cousin marriage might reduce various other costs for the lineage. For one thing, anthropological records show that in case of double cousin marriage, in fact no land changes hands at the marriage (Pine, 2003), which means zero transaction costs due to transferring property across generations. For another, by excluding outsiders, cousin marriage reduces the rivalries and conflicts over inheritance by creating overlapping interests and doubly relating siblings to each other through the young couple and their grandchildren (Shenk et al., 2016). Also, in case of cousin marriage, men also take advantage of existing relationships. They know each other and have a sense of each other's personalities and how to work together, which is an advantage for the male lineage as a group of cooperators (Shenk et al., 2016). In contrast, outmarriage might diminish local skills and the stock of knowledge over time and across generations (Bidner and Eswaran, 2015).

Finally, the possibility of daughters contesting for their share of inheritance is sufficient to produce the cousin marriage outcome even if it is not associated with the actual ownership of property. In fact, by alleviating concerns for the welfare of offspring and the potential for conflict between siblings, cousin marriage makes it easier to prevent actual ownership of property by women. Note that in the case of double cousin marriage in chart (c), a daughter has no incentive for actual property ownership if she cares only about the welfare of her offspring. With double cousin marriage, in the next generation, the land will be reallocated among her children and will benefit them even if parcels of land belong to male relatives (i.e., her brother and cousin/husband).

Female economic participation. The effect of female inheritance on female economic participation follows the standard economic models of labor supply. A woman's labor supply decision has two key ingredients: opportunity cost and income. A higher wage increases the opportunity cost and has a substitution effect that encourages working, but also has an offsetting income effect that reduces working. However, an increase in unearned income only has an income effect resulting in reduced work.

Since inheriting property increases women's lifetime unearned income, it is expected to reduce their labor supply. Rather than actual

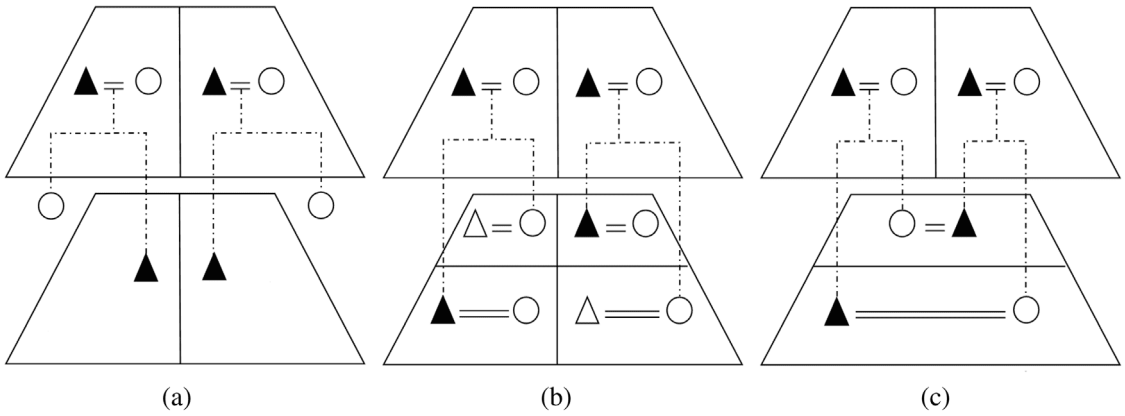

Fig. 3. Triangles, circles, lines, and "=" represent males, females, descent bonds, and marriage respectively. The first generation starts with two brothers, and thereafter, every family has one son and one daughter. Black triangles represent those within the male lineage. Chart (a): No female inheritance: primogeniture retains the family land intact and within the male lineage. Chart (b): Female inheritance and outmarriage: female offspring marrying outsiders fragments the land and diffuses land parcels out of the male lineage. Chart (c): Female inheritance and cousin marriage: inmarriage decreases land fragmentation and keeps land parcels within the lineage.

property ownership by daughters, the same effect can be caused by increased bargaining power of women leading to alternative transfers such as higher dowries and gifts (Roy, 2015).

One would also expect a relatively higher income effect for women in blue-collar jobs (such as farm work). Blue-collar jobs are difficult, less compatible with domestic duties, and are subject to social stigmas that reduce the social status of the family (Goldin, 1994). Therefore, only at low levels of income, women work in manual jobs as secondary workers of the family in order to cover the subsistence needs. However, with an unearned income to contribute to the basic needs of the family, there is a strong incentive for women to withdraw from the labor market and spend relatively more time on domestic activities. On the other hand, the reduced labor supply due to the income effect should be lower in white-collar jobs such as clerical and services sectors, which are more acceptable forms of employment for women or even a source of social status (Dessing, 2002).

This is consistent with evidence from India suggesting that with a relative affluence, women avoid working on farms, which is considered difficult and low status (Mammen and Paxson, 2000; Acharya, 2002). The data from India also confirms that women in poorer families are much more likely to work as farm laborers (33% in the lowest quintile versus 3% in the highest quintile).

Inheritance rights also increase women's bargaining power in the family, even if they are not accompanied by actual property ownership. This will allow them to avoid free or low compensation work for the family. Therefore, compared with self-employed women, we should expect a larger income effect and decrease in labor supply among women working for their families.

4. The Hindu Succession (Amendment) Act of India

Since 1956, property rights for Hindus (also Sikhs, Jains, and Buddhists) in India have been governed by the Hindu Succession Act (HSA). The act applies to all states except Jammu and Kashmir, and it explicitly exempts Muslims, Christians, Parsis, and Jews. As in traditional Hindu law, under the HSA women had no rights to joint family property (including land and other ancestral assets). Since 1956, some states have amended the Act so that both sons and daughters have a right to joint family property (Kerala in 1976; Andhra Pradesh in 1986; Tamil Nadu in 1989; Maharashtra and Karnataka in 1994). However, these amendments applied only to women who were not yet married at the time of the reform in their state. In the other 29 states,[7] men remained the sole joint heirs of family property until 2005. In response to international agreements—such as the Beijing Platform for Action[8]—that emphasize the importance of women's land and property rights, the government of India prepared and introduced the Hindu Succession (Amendment) Bill to parliament (Rajya Sabha) in 2004. The Hindu Succession (Amendment) Act was passed in 2005, and applied to any disposition, alienation, and partition of property that had taken place after December 20, 2004. Under the amendment, all daughters, including married daughters, are also joint heirs in family property such as agricultural land.[9]

The states that passed amendments to the HSA before 2004 are the farthest southern states, which were traditionally more gender equal for two reasons. First, their traditional schools of law (the Madras and Bombay sub-schools) were more liberal in recognizing the rights of women (Halder and Jaishankar, 2008). Second, southern states mostly were ryotwari areas under the British land revenue systems. In the ryotwari areas, women's landownership is higher due to higher land ownership by peasants (Choudhury et al., 2017). Southern states agreed to include female inheritance rights when the HSA was passed in 1956. However, the northern states dismissed the idea by a majority vote, and the traditional laws of female exclusion in joint property were maintained until 2005 (Agarwal, 1995; Anderson and Genicot, 2015). Interestingly, Hindus in southern India have historically experienced much higher cousin marriage rates compared with Hindus in the other states (see Fig. 4); in the sample of those married in or after 2000, the rate was 22.5% in the states that passed local amendments in the past, versus 6.5% in other 29 states. This historical difference in the marriage patterns of the southern and northern states might partly be a consequence of their different traditional attitudes to female inheritance. Therefore, there might be concerns regarding the endogeneity of the amendments in the five states.

For several reasons, I focus here on other 29 states and the 2005 amendment only. First, endogeneity of the amendments in the five states is possible, as discussed above. Second, under the past amendments in the five states, only unmarried women were eligible to inherit.

[7] Excluding Jammu and Kashmir, which was exempt from the HSA, and Telangana, which was part of Andhra Pradesh until 2014.

[8] Government of India, National review on the Implementation of Beijing Declaration and Platform for Action, 2015, p. 12.

[9] In a joint Hindu family coparcenary, when person A inherits a property from his father, then that property also becomes the coparcenary property of person A's children, grandchildren, and great grandchildren, and they will acquire equal coparcenary right in such property by virtue of their birth. Therefore, person A can will only his share of joint property or any self-acquired property, and he cannot disinherit his sons and daughters by will.

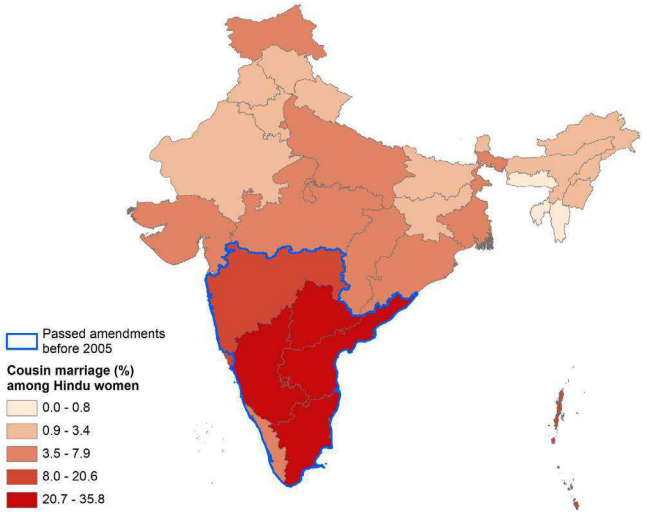

Fig. 4. Cousin marriage rates among Hindu women across Indian states, 1992–2016. *Source:* the National Family Health Survey of India.

Therefore, timing of marriages might have responded to the amendments. That is, the anticipation of the amendments, families who did not want their daughters to be eligible married them just before the law passed (Heath and Tan, 2020). This is not a concern for the 2005 amendment, under which both married and unmarried women were eligible for inheritance. Third, past amendments not only were different from the 2005 amendment, but also were in some cases different from each other. For example, the amendment of the state of Kerala removed the legal status of the joint family altogether. Fourth, theoretically it is not obvious whether in each of the five states the national 2005 amendment imposed female inheritance even more strictly or led to its looser imposition.

4.1. Hindu women's land ownership in practice

There is little evidence that female inheritance reforms in India have actually increased land ownership among women. Local amendments in southern states had virtually no impact on the actual likelihood of inheritance for women (Bates, 2004; Brule, 2012; Roy, 2015). It is not possible to test the effectiveness of the 2005 amendment yet.[10] However, there is little evidence that the 2005 amendment has sharply increased female inheritance in India.

For example, there is only a 2 percent increase in women's land ownership status within a period of 18 years from 1994 to 2012. Also, according to Agricultural Censuses, India has witnessed a marginal increase in share of female landowners from 11.70 percent in 2005–06 to 12.79 percent in 2010–11 and 13.9 percent in 2015-16 (Choudhury et al., 2017; Center for Land Governance, 2020). The rates are relatively higher for southern states, likely due to a combination of their more gender-equal traditional schools of law, the ryotwari land system, and local amendments in the past.

Many factors may have contributed to the inefficiency of amendments in promoting female property ownership. One, the awareness of the HSA laws and women's legal rights is still low among Hindu families. For example, according to a 2011 survey in Andhra Pradesh, a state that has experienced a local amendment in 1994 and a national amendment in 2005, only 14% of women have heard of the HSA, and among them, only 40% were aware that the HSA gives equal inheritance right to sons and daughters (U.N. Women, 2011). Two, institutions and local authorities often discriminate against women in access and ownership of land resources. In 2012, for example, local authorities in the Jind district in Haryana banned married women from seeking a share in parental property, decreeing that every married girl has to give up her share of parental land and transfer it to her brothers, otherwise she has to pay a fine (Sircar and Fletschner, 2014). Three, many parents see daughter's dowry as a substitute of land and other properties in their inheritance. Roy (2015) argues that HSA amendments may have encouraged dowry payments. Parents appear to be compensating their daughters for disinheriting them from household property by transferring to them alternative forms of wealth such as dowries. Four, under social pressure, many women are forced to give up their share of their parents' property in favor of their brothers, for example, due to the fear of breaking familial bonds. According to a survey, being on bad terms with the community and their families and brothers are the main reasons why the majority of women in Bihar and Andhra Pradesh did not even want to inherit land from their parents (U.N. Women, 2011). Five, even when women do get land in their own names through inheritance or dowry, the decision making power on use of the land mostly remains in the hands of male relatives.

As argued in Section 3, the possibility of daughters contesting for their share of inheritance (and not necessarily their actual inheritance and property ownership) could deliver the same outcomes of increased cousin marriage and reduced female economic participation, as predicted in this study.

5. Data and identification strategy

In this section, I define two groups of outcome variables for marriage with relatives and female economic participation and estimate the impact of the 2005 amendment on outcome variables using a difference-in-differences approach. I use data collected from adult women (15–49 years old) by the National Family Health Survey (NFHS) of India, a repeated cross-sectional survey conducted in four rounds between 1992 and 2016. I dropped observations of respondents with unknown religions and a few observations on Jews and Parsis.

In the difference-in-differences model, the first difference I use is the religion of the respondent. The amendment should have had an impact on Hindu women (Hindus, Sikhs, Jains, or Buddhists) but not women from the exempted religions (Muslims, Christians). The second difference I use is exposure to the amendment, as measured by the year of the first marriage. The decision to marry a relative could have been affected by the amendment only if the marriage took place after the amendment, in or after 2005. Similarly, assuming that labor force participation has evolved differently for women married after the amendment, their economic participation rates at the time of the survey should be different from the rates of women who married before the amendment.

I define four dummy variables for marriage with relatives. The first variable is marriage to blood relatives which takes value 1 for marriage to any blood relative (first cousin, second cousin, and other blood relatives such as second cousins, uncles, etc.). This constitutes 6% of all marriages. I also defined three dummy variables for components of marriage to blood relatives: marriage to paternal first cousins (33% of marriages to blood relatives), marriage to maternal first cousins (29% of marriages to blood relatives), and marriage to other relatives such as second cousins, uncles, etc. (38% of marriages with blood relatives). Note that the NFHS data distinguishes father's side and mother's side of the marriage only for the first cousin marriages.

I also define six dummy variables for female economic participation as follows. The first variable is working, which takes value 1 if the respondent has worked in the last 12 months. Then I define two dummy variables for its components with respect to economic sectors: working in agriculture and working in non-agriculture

[10] The Rural Economic and Demographic Survey which includes retrospective information on all members of the household such as their landownership is available only in four rounds between 1971 and 2006.

(professional/technical/managerial/clerical/sales/services and domestic/manual). I also define three dummy variables for the components with respect to relation to the employer: working for family members, working for someone else, and being self-employed.

I assume that an outcome y for woman i of religion r, from state s, born in year τ, married for the first time in year t is a function with the following form:

$$y_{irrts} = \alpha + \beta_1 T_{irt} + \beta_2 \gamma_r + \beta_3 \delta_t + \beta_4 \theta_s + \beta_5 \lambda_\tau + \beta_6 (\theta_s \times \lambda_\tau) + \beta_7 (\theta_s \times \gamma_r) + \beta_8 X_{ircts} + \epsilon_{ircts}$$

$T_{irt'}$ captures a woman's treatment status and takes value 1 if she is a Hindu (i.e., Hindu, Sikh, Jain, or Buddhist) and married for the first time in or after 2005.[11] The coefficient of interest is β_1, which identifies the effect of exposure to the amendment. The religion dummy variable (γ_r) takes value 1 if a woman is a Hindu, and takes value 0 if she is a Muslim or Christian. It captures time-invariant characteristics of Hindus. Marriage year fixed effects (δ_t) control for time-series changes of the outcome variable across marriage cohorts. State fixed effects (θ_s) control for time-invariant characteristics of the states. Birth year fixed effects (λ_τ) control for time-series changes of the outcome variable across birth cohorts. State-birth year fixed effects ($\theta_s \times \lambda_\tau$) control for state-specific changes over time. Religion-state fixed effects ($\theta_s \times \gamma_r$) control for time-invariant characteristics of Hindus across the states. Finally, a vector of observable characteristics (X_{irts}) controls for the respondent's education (four categories); wealth quintile; dummy variables for whether she lives in an urban region, whether she is a member of a scheduled caste, and whether she is a member of a scheduled tribe; and finally, fixed effects for rounds in which respondents are surveyed.

6. Results

In this section, I present regression results for two groups of outcome variables. Table 1 shows regression results for marriage with relatives. Due to the low number of states (i.e., 29), I cluster standard errors at the level of primary sampling unit. But I later check the robustness with standard errors clustered at state level. I start with the simplest difference-in-differences model in the first column and then gradually add more interactions in the next two columns. Column (3) presents the results from the full regression specification above. Table A1 of Appendix A includes the descriptive statistics of variables.

Regression results from Table 1 indicate that being a Hindu is negatively associated with cousin marriage since Muslims—who constitute 56% of the dropped category—have much higher cousin marriage rates (with 18.7% versus 4.7% among Hindus). The result from the regression with the full specification indicate that exposure to the amendment has increased the likelihood of marrying a blood relative by 1%. The coefficient is statistically significant and also economically significant considering the mean of dependent variables for the Hindu sample and compared with the coefficients of individual-level controls such as wealth and education in full regressions results presented in Table A2 of Appendix A.

I then examine the impact of exposure to the amendment on components of marriage to blood relatives, i.e., marriage to paternal first cousins, marriage to maternal first cousins, marriage to other blood relatives. Coefficients of exposure to the amendment are significant in regressions except for maternal first cousins. The exposure increases marriage to paternal cousins by 0.8% (~6% of SD) and marriage to other blood relatives by 0.4% (~3% of SD). Below, I will discuss why we do not see the same effect on marriage to maternal first cousins.

The identifying assumption of the difference-in-differences approach is the identical counterfactual trends in treatment and control groups. To provide some supporting evidence on this account, Fig. 5 presents an event-study analysis by including lags and leads of the treatment, i.e. interactions between Hindu dummy and two-year intervals of marriage before and after the amendment. I perform the event study with two-year intervals instead of one year in order to get estimates that are robust and more precise. The post-treatment period is defined as beginning with the two-year interval consisting of the years the amendment bill was introduced (2004) and passed (2005).

The event studies are informative. First and most importantly, the estimated coefficients of leads are insignificant in all dependent variables, which indicates the absence of pre-existing trends. Second, they confirm the differences in the impact of exposure to the amendment on components of marriage with blood relatives. There is a significant jump in marriage to paternal first cousins, and to some extent, other blood relatives among Hindu women married at the time of or right after the amendment. It is likely that the initial jump in paternal cousin marriages is due to the expectations of daughter's inheritance, and the effect wears out over time once families realize that female inheritance does not have to be materialized.

In case of maternal first cousins, there is no significant change among Hindu women exposed to the amendment. Comparing the statistical significance and magnitude of coefficients, R-squared across regressions, and the event studies suggest that the significant increase in marriage with blood relatives is mainly driven by marriage to blood relatives on the paternal side. This is consistent with arguments and anthropological evidence that marriage to the father's brother's daughter is an important mechanism to keep property within the male lineage. Some increase in marriage to other blood relatives is not surprising, considering that it includes marriage to second cousins and uncles on the father's side as well.

Considering prohibitions on cousin marriages in many Hindu communities and also in the Hindu Marriage Act of 1955 (Bittles, 2002; Banerjee and Roy, 2002), the results above highlight the importance of marriage arrangements in response to female inheritance laws. We should note that cousin marriage is only one of many possible strategies to deal with the consequences of female inheritance. For example, Roy (2015) shows that parents might also gift away their property to their sons in order to circumvent female inheritance laws.

Table 2 presents regression results for female economic participation. Table A1 of Appendix A includes the descriptive statistics of variables. Being a Hindu is positively associated with female economic participation, since Muslims—who constitute 56% of the dropped category—have lower female economic participation rates (20% versus 33.8% among Hindus). The result from the regression with the full specification indicates that women exposed to the amendment are 6.8% less likely to have been working within the last 12 months. The coefficient is statistically significant and also economically significant considering the mean of dependent variables for the Hindu sample and compared with the coefficients of individual-level controls in full regressions results presented in Table A3 of Appendix A.

Next, I examine two aspects of the impact of exposure to the amendment on components of economic participation: whether the individual works in agriculture section or non-agriculture section and whether the individual works for family, someone else, or herself. The results from the top panel indicate that the exposure to the amendment decreases the likelihood of working in agriculture and non-agriculture sectors by 5% (~13% of SD) and 1.8% (~5% of SD) respectively. The results from the bottom panel show that the exposure to the amendment reduces working for family, working for someone else, and being self-employed by 3.9% (~10% of SD), 2.1% (~7% of SD), and 0.8% (~3.6% of SD) respectively.

The results from event studies in Fig. 6 depicts a similar image. There is a significant drop in working, working in agriculture, and working for family among Hindus in years after exposure to the amendment. They also indicate the absence of pre-existing trends for these variables. However, in case of working in non-agriculture section, a

[11] I could alternatively define the treated group as those married in or after 2004—the year the amendment bill was prepared and introduced by the government. The results are qualitatively the same.

Table 1
Difference-in-differences analyses of outcome variables for marriage with relatives using data on Indian women. Full regression results are reported in Table A3 of Appendix A. Individual-level controls include caste, tribe, and urban dummy variables; education and wealth; and survey round fixed effects. The omitted state is Andaman and Nicobar Islands. OLS estimates are reported with robust standard errors, clustered at the level of the primary sampling unit, in parentheses. State level clustered robust standard errors for regressions with full specification are reported in Table A4 of Appendix A. ***, **, and * indicate significance at the 1, 5, and 10% levels.

VARIABLES	Marriage to blood relatives (Hindu sample mean=0.047, SD=0.237)			Marriage to paternal first cousins (Hindu sample mean= 0.015, SD=0.140)		
	(1)	(2)	(3)	(1)	(2)	(3)
Subject to amend.	0.014***	0.010***	0.010***	0.010***	0.008***	0.008***
	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Hindu	−0.119***	−0.098***	−0.097***	−0.048***	−0.051***	−0.050***
	(0.003)	(0.009)	(0.009)	(0.002)	(0.005)	(0.005)
Observations	461,675	461,675	461,675	461,675	461,675	461,675
R-squared	0.043	0.057	0.057	0.021	0.030	0.030
	Marriage to maternal first cousins (Hindu sample mean=0.011, SD=0.130)			Marriage to other blood relatives (Hindu sample mean= 0.021, SD=0.149)		
	(1)	(2)	(3)	(1)	(2)	(3)
Subject to amend.	−0.001	−0.003	−0.003	0.005***	0.004**	0.004**
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
Hindu	−0.049***	−0.035***	−0.035***	−0.022***	−0.011***	−0.012***
	(0.001)	(0.004)	(0.004)	(0.001)	(0.004)	(0.004)
Observations	461,675	461,675	461,675	461,675	461,675	461,675
R-squared	0.021	0.030	0.030	0.008	0.012	0.012
Marriage year FE	yes	yes	yes	yes	yes	yes
State FE	yes	yes	yes	yes	yes	yes
Birth year FE		yes	yes		yes	yes
State × Birth year FE		yes	yes		yes	yes
State × Hindu FE		yes	yes		yes	yes
Individual-level controls			yes			yes

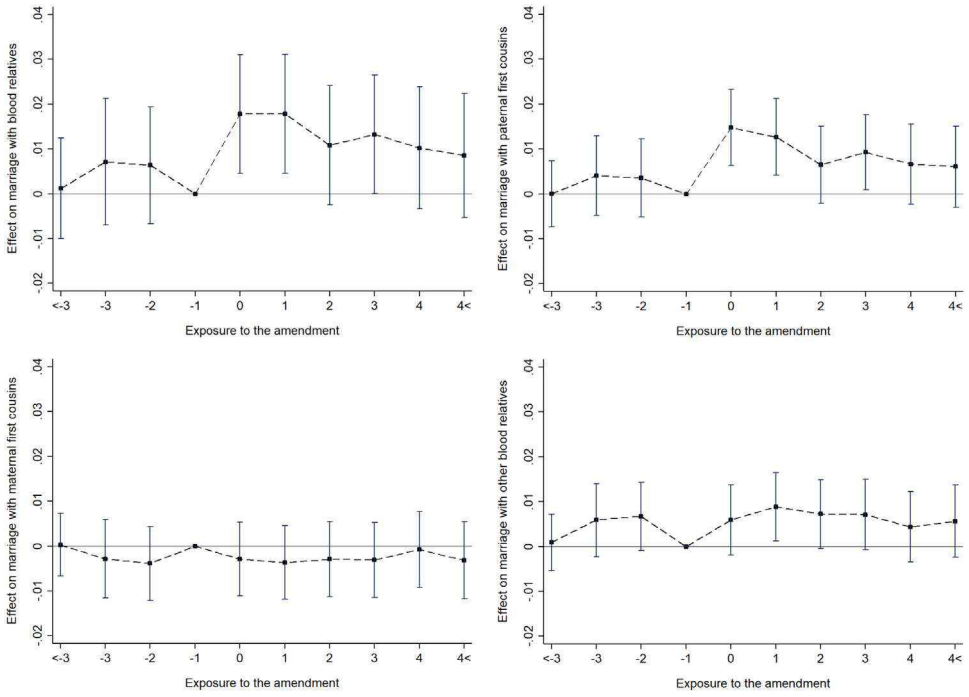

Fig. 5. Event study of the effect of exposure to female inheritance amendment on outcome variables for marriage with relatives. Coefficient estimates and 95% confidence intervals from the set of interactions between Hindu dummy variable and two-year intervals of marriage. Post-treatment starts at time 0; the two-year interval consisted of 2004 and 2005. Interactions are expressed relative to time -1, the omitted two-year interval (2002–2003) which serves as the baseline.

significant drop in the variable starts later, and also, a pre-existing trend cannot be ruled out. There are also no significant changes in working for someone else and being self-employed among the treated groups.

Comparing results from regression analyses and event studies suggests that the decline in female economic participation mainly comes from the decline in working in agriculture and for family. These are forms of female economic participation among poorer and less educated families. Therefore, it is not surprising to see a larger income effect of female inheritance in the case of working in agriculture and for family. Two points make this connection clearer. First, working in agriculture and for family are negatively associated with wealth and education while the correlations are positive for working in non-agriculture and being self-employed. Second, the coefficient of education is significant and negative for working in agriculture and for family but positive

Table 2
Difference-in-differences analyses of outcome variables for female economic participation using data on Indian women. Full regression results are reported in Table A3 of Appendix A. Individual-level controls include caste, tribe, and urban dummy variables; education and wealth; and survey round fixed effects. The omitted state is Andaman and Nicobar Islands. OLS estimates are reported with robust standard errors, clustered at the level of the primary sampling unit, in parentheses. State level clustered robust standard errors for regressions with full specification are reported in Table A4 of Appendix A. ***, **, and * indicate significance at the 1, 5, and 10% levels.

VARIABLES	Working (Hindu sample mean=0.338, SD=0.473)			Working in agriculture (Hindu sample mean= 0.193, SD=0.390)			Working in non-agriculture (Hindu sample mean= 0.140, SD=0.352)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Subject to amend.	−0.050***	−0.074***	−0.068***	−0.041***	−0.058***	−0.050***	−0.008	−0.016**	−0.018***
	(0.008)	(0.008)	(0.008)	(0.007)	(0.007)	(0.006)	(0.006)	(0.007)	(0.006)
Hindu	0.069***	0.088***	0.088***	0.066***	0.088***	0.129***	0.001	−0.009	−0.048***
	(0.005)	(0.016)	(0.016)	(0.005)	(0.009)	(0.010)	(0.004)	(0.016)	(0.016)
Observations	260,264	260,264	260,264	260,264	260,264	260,264	260,264	260,264	260,264
R-squared	0.072	0.086	0.152	0.071	0.096	0.199	0.026	0.041	0.067
	Working for family (Hindu sample mean=0.181, SD=0.383)			Working for someone else (Hindu sample mean= 0.110, SD=0.310)			Being self-employed (Hindu sample mean= 0.047, SD=0.220)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Subject to amend.	−0.037***	−0.047***	−0.039***	−0.015***	−0.021***	−0.021***	0.002	−0.007*	−0.008**
	(0.007)	(0.007)	(0.007)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Hindu	0.044***	0.048***	0.066***	0.018***	0.023	0.010	0.007***	0.017***	0.012**
	(0.004)	(0.006)	(0.007)	(0.003)	(0.014)	(0.014)	(0.002)	(0.006)	(0.006)
Observations	260,155	260,155	260,155	260,155	260,155	260,155	260,155	260,155	260,155
R-squared	0.051	0.070	0.122	0.030	0.040	0.069	0.025	0.037	0.041
Marriage year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes
State FE	yes	yes	yes	yes	yes	yes	yes	yes	yes
Birth year FE		yes	yes		yes	yes		yes	yes
State × Birth year FE		yes	yes		yes	yes		yes	yes
State × Hindu FE		yes	yes		yes	yes		yes	yes
Individual-level controls			yes			yes			yes

for working in non-agriculture and being self-employed (see detailed results in Table A3 of Appendix A). This is consistent with Afridi et al. (2018)'s findings that education reduces female economic participation in rural regions. Like education, female inheritance allows women to free themselves from forms of economic participation which are difficult and associated with social stigmas. In traditional and patrilineal societies, domestic work might be a preferred choice for women especially less-educated ones. Therefore, women might prefer domestic work to many forms of employment (Jayachandran, 2019). Likely due to their higher bargaining power, women who had inheritance rights at the time of marriage have entered marital arrangements that are less likely to require working in agriculture or for family.

7. Robustness checks

In this section, I provide some additional tests and robustness checks.

State-level clustering. Due to the low number of states, I cluster standard errors at the level of state. However, the results are robust to clustering at the state level. Table A4 of Appendix A reports the results. The coefficient of exposure to the amendment is insignificant only for marriage to maternal cousins and being self-employed. To address the concern due to the low number of clusters, I also provide the Wald test results using the wild cluster bootstrap (Cameron et al., 2008; Roodman et al., 2018).

Parallel counterfactual trends. Event studies above provide evidence for the identical counterfactual trends in treatment and control groups, which is the basic assumption of the difference-in-differences approach. In addition, I conduct placebo tests in time. This involves re-estimating the difference-in-differences model over the pre-treatment period, but with the assumption that the treatment took effect at an earlier date. Table A5 of Appendix A shows full-specification regression results for outcome variables, assuming that the amendment took place in different years after 2000. The difference-in-differences estimator is statistically insignificant except for working for someone else. This implies zero placebo effects on main outcome variables, and similarly to results from the event studies, provides evidence on parallel counterfactual trends.

Age-cohort comparison approach. Unlike the past amendments in the five states, under the 2005 amendment both unmarried and married women were eligible for inheritance. Therefore, endogeneity of the year of marriage is less of a concern for the 2005 amendment. However, to address any such concerns and to show the robustness of the results, here I follow an approach similar to Duflo (2001), Osili and Long (2008), and Heath and Tan (2020). I compare younger cohorts likely to be subject to the amendment with older cohorts who were likely to have been married by the time the amendment was passed and thus were probably not affected by the amendment in their marriage and premarital sex decisions. I define the treatment group to be *Hindu* women aged 14 or younger (the 10th percentile of the first marriage age distribution for females) in 2005—when the amendment was passed—and the control group to be women of all religions aged 24 or older (the 90th percentile of the distribution) in 2005. Defined based on the described age cohorts, 97.5% of the treatment group were actually exposed to the amendment, and 97% of the control group were not exposed to the amendment. Table A6 of Appendix A reports the results from the age-cohort comparison approach. The direction and significance of the coefficients of the exposure to the amendment remain unchanged.

Rise of nationalism. There is a concern that outcomes of Hindu women may have evolved differently after 2005 for reasons unrelated to the amendment. One assumption of my analyses is the fact that the amendment applies only to Hindus. To the best of my knowledge, there are no other contemporaneous changes in laws that apply only to Hindu population. However, it can be argued that social and cultural changes such as the rise of Hindu nationalism in India in the last decade might have produced the same outcomes. To rule out this possibility, I run some additional analyses using a dummy variable which takes value 1 if the ruling party in the state is currently Bharatiya Janata Party—a major Hindu nationalist political party—or a coalition including the party. I include the variable and its interaction with being exposed to the amendment to see if the impact of the amendment correlates

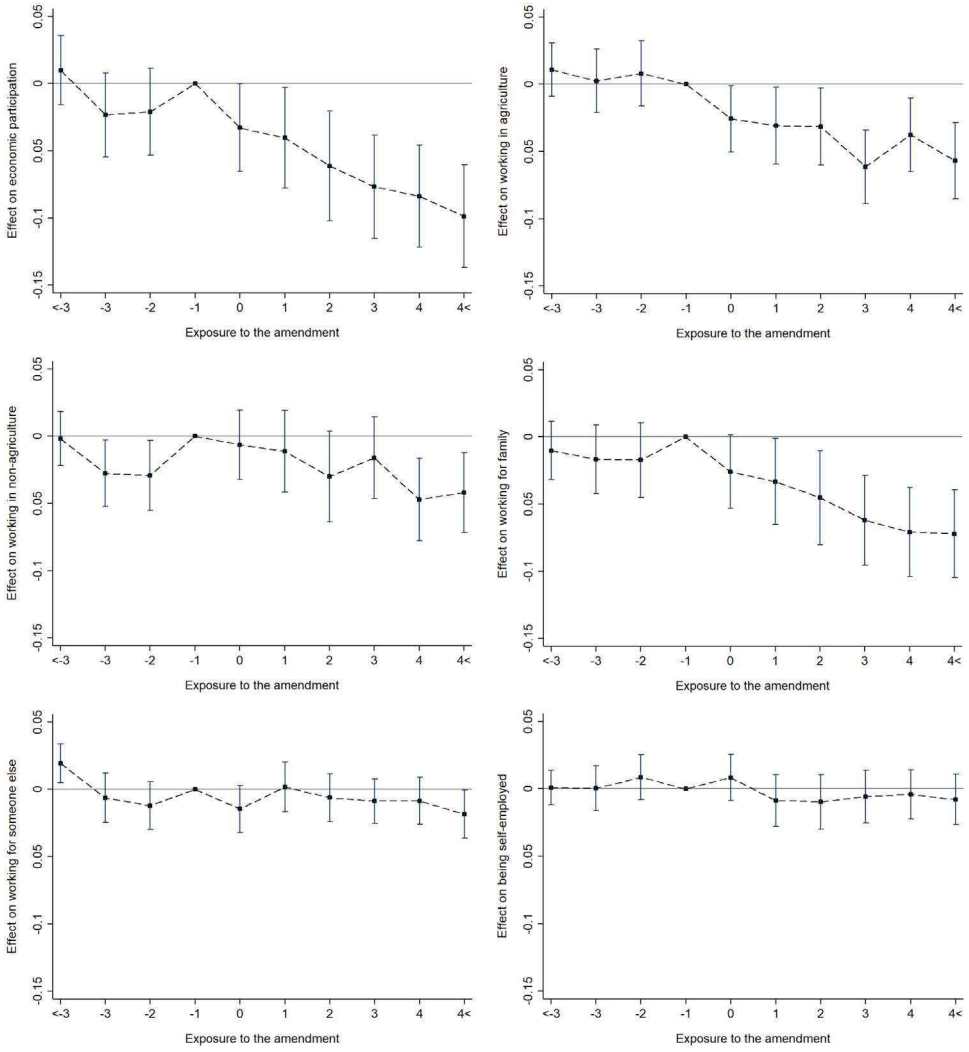

Fig. 6. Event study of the effect of exposure to female inheritance amendment on outcome variables for female economic participation. Coefficient estimates and 95% confidence intervals from the set of interactions between Hindu dummy variable and two-year intervals of marriage. Post-treatment starts at time 0; the two-year interval consisted of 2004 and 2005. Interactions are expressed relative to time -1, the omitted two-year interval (2002–2003) which serves as the baseline.

with support for BJP. Table A7 of Appendix A shows the results from regression analyses. The impact of the amendment does not seem to be significantly different in BJP ruled states. On a side note, however, results indicate significantly higher marriage with blood relatives in BJP ruled states.

Cousin marriage and the status of women. The anthropological literature predicts negative consequences of high cousin marriage on women's welfare. If love and premarital relationships are not controlled, they might lead to marriage with outsiders because ties of descent are not central in love relationships (Harrell, 1997; Mitterauer, 2010). Therefore, cousin marriages are generally arranged by parents through gender segregation and restrictions on contact between opposite sexes. Under such restrictions, young people are also much more likely to meet and thus form romantic attachments to their cousins who are among the few young people of the opposite sex with whom it is appropriate for them to socialize (Goody, 1976; Shenk et al., 2016). Therefore, young women's relations and mobility are restricted by living in tight kin networks and engaging in cousin marriages. Consistent with this literature, Alesina et al. (2016) show that being from an ethnicity that was traditionally endogamous has a positive and significant impact on spousal violence. Mobarak et al. (2019) also show that the likelihood of domestic violence increases with cousin marriage.

In Table A8 of Appendix A, I test the association of marriage to blood relatives with some indicators of women's autonomy and status. Marrying a blood relative is associated with significantly higher domestic violence and lower marriage age. This is in line with the above literature. However, it is also associated with having money of one's own. In addition, I run analyses to test the impact of exposure to the amendment on the outcome variables and also use exposure to the amendment as an instrument for marriage with blood relatives. The results of these analyses (not reported here) are not conclusive and parallel trend tests generally fail. Therefore, the short-run impact of cousin marriage on the status of women in developing countries could be a more complicated story that requires further investigation.

8. Conclusion and discussion

Theories on how inheritance systems shape family relationships, marriage patterns, and the status of women have been advanced by social scientists such as Adam Smith, Lewis Morgan, Max Weber, and Jack Goody. Relying on this literature, I developed a conceptual framework and suggest two hypotheses. First, when women are included in inheritance, patrilineal societies encourage cousin marriages in order to preserve women's inheritance within the male lineage and prevent fragmentation of land holdings. Second, female inheritance increases unearned income, and therefore, reduces female economic participation due to the income effect. This effect is larger for women working in manual jobs which are subject to social stigmas of patriarchal societies.

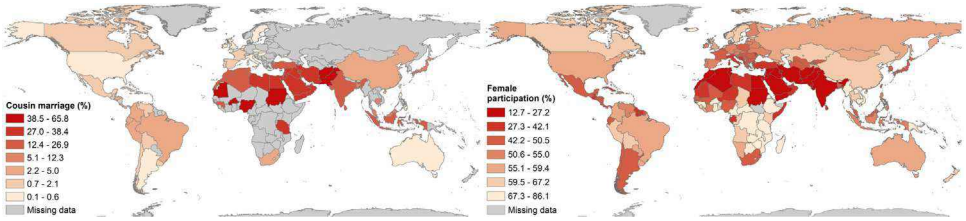

Fig. 7. Left: Cousin marriage rates (up to and including second cousins) around the world. Source: Bittles and Black (2015). Right: Labor force participation rate of women, measured by proportion of women ages 15 and older who are economically active, 2010–2016. Source: International Labour Organization.

In an attempt to identify the causal effects of female inheritance, I used a difference-in-differences approach to estimate the impact of the reform of inheritance regulations in India in 2005 that substantially improved women's rights on land. Consistent with the causal direction stated by the theory, the results indicate that women whose marriages were exposed to the reform have higher rates of paternal cousin marriages and are less likely to work in agriculture and for family.

The findings of the study have two important implications. First, under patrilineal restrictions on women's property ownership in developing countries such as India, the mere enacting of female inheritance might create unintended consequences for young women's marital choices and social relations.

The second implication is a historical one. The effect of female inheritance in encouraging inmarriage and discouraging female economic participation might have been operated for a long time and for a larger share of the population in some patrilineal societies that traditionally practiced female inheritance. The long-term practice of female inheritance in a patrilineal society may create persistent cultural traits and beliefs regarding marriage and the status of women that affect people—even those who do not receive inheritance, and even in an era in which, through industrialization, inheritance is no longer the only source of wealth and means of production. The literature also points out that arranging marriages within kinship groups requires gender segregation and controlling women's relations which encourages the culture of gender segregation, seclusion of women inside homes, and the veiling of women.

Using data on pre-industrial societies from the Ethnographic Atlas, I am able to confirm that female inheritance (i.e., partible inheritance by both sexes in Fig. 2) is positively correlated with cousin marriage practice and negatively correlated with female participation in agriculture and premarital sexual freedom. These correlations are robust to controlling for a large set of control variables such as regions fixed effects.[12]

This might have an important implication for the evolution of norms encouraging inmarriage and the seclusion of women in Islamic societies where Sharia has mandated female inheritance. In the Qur'an, there is no specific guidance that encourages cousin marriage (Bittles, 2012) and no explicit prescription on the veiling of women (Ahmed, 1992). But, of all the economic rules in the Qur'an, the most detailed are those of inheritance (Kuran, 2012). The Qur'an, the main source of Islamic law, explicitly states the Islamic inheritance rules in such detail (the Qur'an 4:11) that no space is left for different interpretations regarding female inheritance. Islamic religious authorities have often paid great attention to the observance of female inheritance, while similar legal rights for women did not exist in the West until the nineteenth century (Korotayev, 2000). Islam, in fact, may be the only religion that formally specifies women's inheritance rights. In line with the findings of this study, this may explain why cousin marriage (mean 32%) is most common, and female economic participation (mean 27%) is lowest, in the Middle East and North Africa (see Fig. 7).

[12] Results and description of variables are available upon request.

Studying these cultural traits is also important for understanding the political economy and human development status of the region. Cousin marriage has historically provided one means of creating and maintaining tight kinship groups such as tribes and clans (Greif, 2006; Mitterauer, 2010). There is growing evidence on how tight kinship systems undermine generalized trust, large-scale cooperation, and democratic institutions; and encourage corruption and conflict (Ermisch and Gambetta, 2010; Alesina and Giuliano, 2011; Greif and Tabellini, 2015; Akbari et al., 2019; Schulz, 2017; Enke, 2017; Moscona et al., 2017; Schulz et al., 2019; Moscona et al., 2020).

Therefore, the findings of this study also highlight how inheritance systems might have contributed to the heterogeneity of kinship patterns across societies. It has been suggested that the Catholic Church's prohibitions on cousin marriages and promotion of consensual (or love) marriages played an important role in dismantling tribes and clans in Europe and stimulating its divergent development (Goody, 1983; Herlihy, 1985; Ekelund et al., 1996; Korotayev et al., 2004; Greif, 2006; Mitterauer, 2010; Schulz et al., 2019). It is true that cousin marriage rates have been historically low in Christian countries. However, these low cousin marriage rates are also consistent with the fact that by putting no emphasis on female inheritance, European inheritance systems did not create economic incentives for cousin marriages and provided an incentive-compatible institutional environment for the Church's marriage policies.

Appendix A. Supplementary data

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.jdeveco.2021.102714.

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