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ABSTRACT

This paper studies the impact of female property rights on male and female suicide rates in India. Using state level variation in legal changes to women's property rights, we show that better property rights for women are associated with a decrease in the difference between female and male suicide rates, but an increase in both male and female suicides. We conjecture that increasing female property rights increased conflict within household and this increased conflict resulted in more suicides among both men and women in India. Using individual level data on domestic violence we find evidence that increased property rights for women did increase the incidence of wife beating in India. A model of intra-household bargaining with asymmetric information and costly conflict is consistent with these ″findings.

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1 Introduction

Suicide rates in India have increased steadily over the last few decades.[1] The WHO estimates that there were 190,000 adult suicide deaths in India in 2010 alone. Suicide has become the second leading cause of death among young Indians - it is the cause of twice as many deaths as HIV/AIDS and almost the same number as maternal deaths in young women (Patel et. al. 2012).[2] This paper studies the impact of female property rights on male and female suicide rates in India.[3] Using state level variation in legal changes to women's property rights, we show that better property rights for women are associated with a *decrease* in the difference between female and male suicide rates, but an *increase* in both male and female suicides.[4] The large majority of suicide victims in India are married and the broad class of 'family problems' is the main reported cause of suicide for both men and women. Using a simple model of intra-household bargaining with asymmetry of information, we show how strengthening women's inheritance rights can raise *intra-household conflict* an increase suicide rates.

In line with the recent literature on the economics of the family, our theoretical model assumes that cooperation in a marriage can generate some gains and that spouses bargain over the allocation of consumptions in the household under the threat of separation (divorce or 'separate spheres model' a la Lundberg and Pollak (1993)). To this basic framework, we add two elements: asymmetry of information and costly conflict. Private information can generate delays and bargaining failure. Hence, we follow Bloch and Rao (2002) and assume that husbands and wives derive some private value of their union that is not known to their spouse.[5] Moreover, we aim to capture the idea that *conflict is an integral part of the bargaining process*. When an offer (regarding the division of resources) is rejected, conflict ensues. Threatening separation does create an atmosphere of discord within the household that comes at a cost, and separation cannot be achieved instantaneously. At any point though, individuals may instead choose the ultimate *exit* and commit suicide. Hence, separations and suicides are predicted by the model.[6] We show that a pro-women redistribution of

[1] The estimated rate of increase is more than 40 percent. More detailed verbal autopsy studies suggest that annual suicide rates could be six to nine times these official rates (refer to Vijayakumar 2010).

[2] India is second only to China in terms of total number of suicides. Relative female to male mortality rates from this cause are high in both these countries compared to other regions. Refer to Anderson and Ray (2010) for an analysis of excess female mortality at different ages by cause of death in China and India.

[3] Refer to Doepke et. a. (2012) for an overview on the economics of female property rights.

[4] These results are obtained while controlling for state and year fixed effects, socio-economic controls and robust to using political variables as instruments for pro-women legislative changes.

[5] See also Friedberg and Stern (2010) and Bobonis (2013).

[6] In Ligon et al (2004)'s dynamic model of bargaining, where divorce and suicide can occur, a key assumption

resources often increases the likelihood of conflict between husband and wives, in which case male suicide increases and the ratio of female to male suicide rates decreases.

Consistently, we provide suggestive evidence that *marital discord* may be the main channel through which improving female property rights raised suicides. We show that the state changes that strengthen female property rights for women are associated with an increase in the suicide rate from family problems but have no significant impact on suicides from other causes. Moreover, using alternative individual level data, which contains measures of domestic violence, we find evidence that increased property rights for women did increase the incidence of wife beating in India. This is consistent with our hypothesis that increasing female property rights increased conflict within household and it is this increased conflict which resulted in more suicides among both men and women in India.

There is a large sociological literature in sociology, following Durkheim's (1897) ground breaking work, studying empirically the relationship between marriage and suicides has been much, though the topic has been mostly ignored in economics.[7] This sociological literature has long recognized the tendency for higher suicide rates, for both men and women, to be associated with increased equality across the sexes. It emphasizes how increased opportunities for women can accentuate tensions and marital discord within households, by challenging traditional roles, increasing the importance of negotiation and raising the potential for conflict. There are numerous empirical accounts investigating the possible consequences of female empowerment on suicides. For example, in the United States, Stack (1987) found a positive relationship between the labor force participation of wives and both the male and female suicide rates over the period 1948-1963, when antipathy towards female labor participation prevailed; and a smaller, but still positive relationship, with male suicide rates over the 1964-1980 period when female labor participation was more widely accepted.[8] Similarly, cross-country studies find a concave effect of female labor participation on the female to male suicide ratio and a positive correlation between the UNDP's Gender Empowerment Measure (a measure of women's access to social, political, and economic power) and suicide rates for both women and men (Pampel 1998).[9] In China, the marriage law in 1950 that granted women the right

is that there is a strong advantage to being the one leaving the other that can create a prisoner dilemma type of situation. When the marriage surplus is small (due to a shock), this preemptive advantage can make it impossible for the couple to stay together. If now one of the party prefers committing suicide than staying alone, suicide would result. However, it is not clear that such a preemptive advantage exists in the case of India.

[7] Ligon et al. (2004) and Stevenson and Wolfers (2006) being two exceptions.

[8] Similar relationships are found for Canada (Trovato and Vos 1992).

[9] Mayer (2003) finds similar correlations in India using state-wide variation in gender-related development indexes.

to choose their own partners, demand a divorce, inherit property, and control of their children, might have resulted in an estimated 70,000 to 80,000 suicides and murders of women between 1950 and 1953 (Das Gupta et al 2000).[10]

Economists and sociologists have studied and found conflicting information on the association between violence and women's empowerment, particularly in terms of economic opportunity, control of assets and social group participation. In India for instance, some studies find that women with greater economic resources, such as ownership of land or employment were less likely to report violence (for example, Panda and Agarwal 2005), while in others, employed women have been found to report violence more frequently than unemployed women, and this is despite the higher income resulting from female employment (see for instance, Eswaran and Malhorta 2011). Likewise, Luke and Munshi (2011) find that when women in the tea plantations in South India earn a higher share of the household income, the probability of marital violence increases. In the context of Progresa in Mexico, Bobonis et al. (2012) find that although women in recipient households were significantly less likely to be victims of physical abuse than women in comparable non-beneficiary households, they were more likely to be victims of emotional violence and more likely to separate.

To be sure, this paper is not suggesting that improving female property rights is undesirable. Until recently, women have been excluded from land rights in many societies and their ability to inherit property has largely been restricted. A growing body of empirical evidence shows that improving women's asset ownership, relative income, or ability to control land impacts the intra-household allocation of resources towards children (among others Lundberg et al. 1997, Duflo and Udry 2004, Bobonis 2009). That improvements in women's relative position in the household can be desirable, not only on equity, but also on efficiency grounds is a frequent justification for policies targeting women, such as microcredit and conditional cash transfers. Moreover, there is evidence that making inheritance laws more egalitarian between sons and daughters has had desirable consequences in India. For example, Roy (2010) and Deininger, Goyal, and Nagarajan (2013) show that the legal changes to women's property rights that we consider here increased daughters' likelihood to inherit land, women's age at marriage and the educational attainment of daughters.

Our model predicts that women's *expected* welfare rises due to increased female property rights.

[10]Suicides of married women and men as a response to family conflict are a common occurrence particularly in developing countries. Canetto (2008) discusses the cultural ramifications of suicide - that relative to developed countries, where suicidal behavior tends to be interpreted as a symptom of individual mental health, in poorer countries, suicide is often considered a normal, albeit last resort response, to a serious family conflict.

When wives contribute a greater proportion of the total family wealth, they do no longer accept any allocation offered by their husbands. Women expect, and are more likely to get, a more equitable share of consumption. However, as a consequence of these higher expectations, conflict within the household can rise and result in higher suicide rates for both men and women.

The paper is organized as follows. The next section presents a theoretical model linking female property rights and suicides. Sections 3 and 4 discuss the changes in female property rights that we study and then we describe our data. Section 5 contains our empirical analysis. Section 6 concludes.

2 A Model of Household Conflict

This section presents a model of intra-household bargaining with asymmetry of information that captures the idea that, within a household, arguing is akin to starting a conflict. While bargaining and conflict are most often studied separately or as alternatives, there is a burgeoning literature that recognize that conflict is often an intrinsic part of bargaining (see Sanchez-Pages 2009 and the signaling models of domestic violence of Bloch and Rao (2002) and Bobonis (2013)).

In our model, husbands and wives can use their resources to generate a surplus, and they bargain over its allocation. As is common in the literature on intra-household bargaining, who owns the resources in the household matters by affecting the outside options of the spouses.[11] In order for bargaining to fail some of the time, we assume that spouses derive some private satisfaction with the marriage, whose magnitude is unknown to their partner. But what is distinct in this model is that we assume that when an offer is rejected, marital discord or conflict ensues. This comes at a cost to each spouse, and a cost whose magnitude is realized only at the time of the conflict. Separation cannot be achieved without going through a period of marital conflict. In contrast, suicide, the ultimate exit, can be achieved instantaneously.

This choice of modeling aims at capturing, or at least accommodating, the main views on suicide. Leenars (1996) provides a useful overview of the psychological perspective on suicide and of Schneidman's work.[12] Both authors point to a lack of coping responses among people who attempt

[11] In the 'unitary' model of the household, who owns the resources does not affect any of the household choices. This model has been empirically rejected in most contexts.

[12] Schneidman is considered to be the "father" of suicidology who pioneered the use of hotlines as a means of suicide prevention.

or commit suicide. A recent traumatic event can be identified in many suicides. In particular, suicide is linked to events involving loss or conflict in existing interpersonal relationships. However, it is not simply the stress or even the pain, but the person's inability to cope with the event or pain. The common stimulus in suicide is unendurable psychological pain. The person may feel any number of emotions but it is the feeling of being hopeless-helpless that is particularly painful for many suicidal people. The situation is unbearable and the person desperately wants a way out of it, an exit. The suicide is functional because it abolishes painful tension for the individual. It provides relief from suffering. Schneidman identified cognitive constriction (i.e., rigidity in thinking, narrowing of focus, tunnel vision, etc.) as a common cognitive state among those who die by suicide, preventing individuals in pain from perceiving ways to end the pain other than death.

Hence, we think of the cost of conflict in our model as the psychological and or physical pain that the spouses do endure during an episode of marital discord. It's magnitude is uncertain ex-ante since it depends on many factors, including their ability to cope and put weight on the future. When the pain is too acute, individuals may choose to commit suicide to end it.

2.1 Preferences

The preferences of husbands and wives depend on the status of their marriage.

If the marriage is intact, both spouses enjoy the household resources, and some surplus is generated. Moreover we follow Bloch and Rao (2002), Friedberg and Stern (2010) and Bobonis (2013) in assuming that each has a personal level of satisfaction with the marriage that is private information. Specifically, we assume that preferences can be represented by the utility functions

$$V^h(I_h + I_w, x, \theta_h) \;\&\; V^w(I_h + I_w, x, \theta_w), \tag{1}$$

where I_j for $j \in \{h, w\}$ represent the resources of the husband and wife, x indicates how pro-wife the division of non public goods are within the household, and θ_j for $j \in \{h, w\}$ are the husband and wife's private level of satisfaction with the marriage. These satisfaction levels are independent and each follows a distribution $G_j(\theta)$.[13] V^w and V^h are strictly increasing in income and personal satisfaction, and weakly concave in income. Moreover, V_w is strictly increasing and concave in x while V_h is strictly decreasing and convex in x, $\partial^2 V^w(I, x, \theta_w)/\partial I \partial x \leq 0$ and $\partial^2 V^h(I, x, \theta_h)/\partial I \partial x \geq$

[13] Adding a joint component to the satisfaction in the marriage that is known to both parties would not affect the analysis.

0, where $I = I_h + I_w$.

If the husband and wife separate or revert to "separate spheres" (Lundberg and Pollak (2003)), their preferences change and are given by the following utilities

$$U^h(I_h) \ \& \ U^w(I_w), \tag{2}$$

where U^h and U^w are strictly increasing and concave. Given that divorce is quasi-inexistent in this context, the separate spheres refer to a noncooperative equilibrium within the marriage.[14]

2.2 Timing

Once a husband and wife are married, they each learn their personal levels of satisfaction with the marriage. The husband then makes an offer x to his wife. If the wife accepts, all is well and they enjoy utilities V^h and V^w in (1). If she refuses, it triggers marital discord or conflict within the household. This means that both husband and wife incur costs (of conflict) κ_h and κ_w drawn from a distribution F (where F_j indicates the marginal distribution for $j \in \{h, w\}$) before separating or reverting to their separate spheres and enjoying utilities U^h and U^w in (2). At any point in this process, individuals may instead choose to *exit*: end the pain and commit suicide.

To be sure, this is an extremely simplified model of conflict and bargaining. It allows us to illustrate our point while avoiding the multiplicity of equilibria that would arise due to signaling in multiple rounds of bargaining.

2.3 Decisions

Working backwards, consider a situation where a wife has rejected her husband's offer. This refusal initiates conflict within the household, and husband and wives observe their costs of conflict κ_h and κ_w. Her utility will be $U^w(I_w) - \kappa_w$ unless she kills herself, in which case she gets 0. Hence, she stays alive if $\kappa_w \leq U^w(I_w)$. Similarly, the husband ends his days if $\kappa_h > U^h(I_h)$, and otherwise gets utility $U^h(I_h) - \kappa_h$. Note that these expressions assume that κ captures the cost of conflict with a spouse or the cost of dealing with the spouse's suicide. This assumption simplifies the analysis by

[14] Official figures on the divorce rate are unavailable but experts say that, despite being rapidly increasing in urban areas, in 2010 only roughly 11 Indian marriages in every 1,000 end in divorce (*http* : *//www.bbc.co.uk/news/*10284416).

removing any strategic (and probably unrealistic) element to the decision of suicide.

It follows that, if the wife rejects an offer, her expected utility is given by

$$E^w(I_w) \equiv F_w[U^w(I_w)]U^w(I_w) - \int_0^{U^w(I_w)} \kappa dF_w(\kappa), \tag{3}$$

while her husband's expected utility is

$$E^h(I_h) \equiv F_h[U^h(I_h)]U^h(I_h) - \int_0^{U^h(I_h)} \kappa dF_h(\kappa). \tag{4}$$

Hence, a wife accepts an offer x if:

$$V^w(I, x, \theta_w) \geq E^w(I_w), \tag{5}$$

where $I = I_w + I_h$.

Let $\widetilde{\theta}(x)$ be the value of θ_w so that inequality (5) holds with equality. $G_w[\widetilde{\theta}(x)]$ is the probability that an offer x is rejected.

The husband chooses an offer x that maximizes his expected utility

$$\left(1 - G_w[\widetilde{\theta}(x)]\right) V^h(I, x, \theta_h) + G_w[\widetilde{\theta}(x)]E^h(I_h). \tag{6}$$

Let $x^*(\theta_h)$ denote the solution to this problem. If the solution is interior, it is characterized by

$$\left(1 - G_w[\widetilde{\theta}(x)]\right) \frac{\partial V^h(I, x, \theta^h)}{\partial x} - \frac{\partial G_w[\widetilde{\theta}(x)]}{\partial x} \left(V^h(I, x, \theta_h) - E^h(I_h)\right) = 0. \tag{7}$$

2.4 Pro-Women Redistribution

We are interested in the effect of changes in property rights that increase women's resources and decrease men's resources. To be sure, such changes would affect not only bargaining within households but the marriage market as well. However, in a society where there are many households of different wealth levels, each having a boy and a girl, if assortative matching between the families results, men would marry women of the same wealth as their sister. Hence, a pro-women change in property rights would result in a one-to-one transfer of wealth between partners. Consequently,

when studying the effect of a pro-women redistribution of wealth, we consider an increase in I_w by τ that is exactly compensated by an equivalent decrease in I_h.

Proposition 1 *When suicide rates are positive, a pro-women redistribution of resources decreases the ratio of female to male suicide rates.*

Proof. Suicides rates consist of the probability of conflict times the probability of committing suicide in the case of conflict. Accordingly, the female suicide rate S_f is given by

$$S_f = \int G_w[\widetilde{\theta}(x^*(\theta_h))]\,(1 - F_w[U^w(I_w)])\,dG_h(\theta_h), \tag{8}$$

and the male suicide rate is given by

$$S_m = \int G_w[\widetilde{\theta}(x^*(\theta_h))]\left(1 - F_h[U^h(I_h)]\right)dG_h(\theta_h). \tag{9}$$

The female to male ratio, S_f/S_m, decreases if $\ln S_f - \ln S_m$ decreases, that is $\frac{dS_f/d\tau}{S_f} < \frac{dS_m/d\tau}{S_m}$. This is clearly the case as

$$\begin{aligned}
\frac{dS_f/d\tau}{S_f} &= \frac{d\left(\int G_w[\widetilde{\theta}(x^*(\theta_h))]dG_h(\theta_h)\right)/d\tau}{\int G_w[\widetilde{\theta}(x^*(\theta_h))]dG_h(\theta_h)} - \frac{f_w[U_w(I_w)]}{1 - F_w[U_w(I_w)]}U^{w'}(I_w) \\
\frac{dS_m/d\tau}{S_m} &= \frac{d\left(\int G_w[\widetilde{\theta}(x^*(\theta_h))]dG_h(\theta_h)\right)/d\tau}{\int G_w[\widetilde{\theta}(x^*(\theta_h))]dG_h(\theta_h)} + \frac{f_h[U_h(I_h)]}{1 - F_h[U_h(I_h)]}U^{h'}(I_h).
\end{aligned}$$

■

To be sure, the effect of a pro-women redistribution of wealth on the suicide rates for both genders is *ambiguous*. Of crucial importance is the effect of a pro-women redistribution on the likelihood of conflict. If conflict increases, the suicide rate of men increases while the suicide rates of women can move in either direction.

Why is a pro-women redistribution likely to increase conflict? Assume that $\frac{1-G_w(\theta)}{g_w(\theta)}$ is decreasing in θ. And let's call *surplus* the difference between the utility in a peaceful marriage and the utility once separated, that is

$$\Delta_i \equiv V^i(I, x, \theta_i) - E^i(I_i),\ for\ i \in \{h, w\}.$$

A decrease in conflict requires that the increase in x^* following a pro-women distribution is sufficiently high to increase the wife's surplus (it more than compensates the increase in her outside option); but for such an increase to satisfy the first order condition (7), the husband's surplus needs also to increase. Whether it is even possible for both surpluses to increase and conflict to decrease depends on the utility function and the distributions. The following subsection show us when conflict increases with linear utilities.

2.5 Linear Utilities

In what follows, we suppose that utilities are linear:

$$V^w(I, x, \theta_w) = xbI + \theta_w \ \& \ V^h(I, x, \theta_h) = (1 - x)bI + \theta_h$$

and that θ^w and θ^h are uniformly distributed between 0 and $\overline{\theta}$.

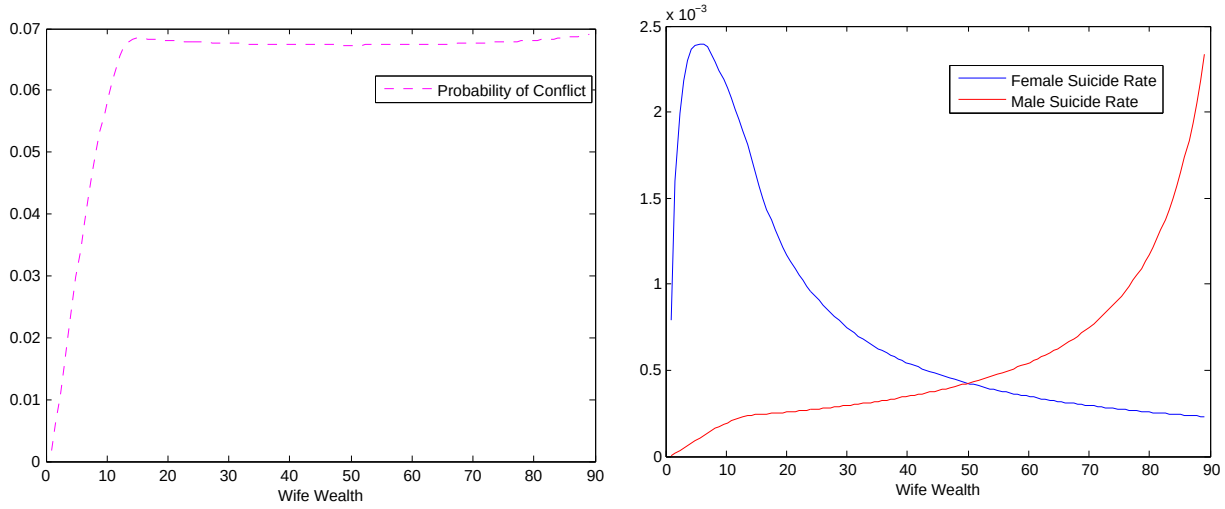
When wives own nothing, they would accept anything. It follows that husbands offer $x = 0$ and initially there is no conflict.

If the surplus generated by cooperation in the marriage is small compared with the range of private satisfaction from the marriage $(b - 1)I < \overline{\theta}$, husbands with low valuations offer to keep all the joint gain from the marriage as long as women's share of wealth is low enough. As a result, conflict *necessarily rises* over this interval. Women's outside options have improved so they now refuse some offers but their prospect are still bad enough that they might commit suicide if the cost of conflict turns out to be too high.

As we keep on raising women's share of wealth, the share offered to wives x keeps on rising and conflict decreases as women and men are becoming more equal and then increases again as women become richer. Naturally, men with a very high satisfaction from the marriage make offers that their wives accept for sure.

This is illustrated in the example that follows. We set $b = 1.2$, $\overline{\theta} = 50$ and $U^j(I) = I$ for $j \in \{h, w\}$. The private satisfaction from the marriage θ^w and the costs of conflict are assumed to be independent and follow a Pareto distribution ($\underline{\kappa} = 0.5$ and $\alpha = 1.1$).

We set the total resources at $I = 100$ and progressively raise the level of resources owned by the wife I^w from 1 to 99. Figure 1 shows the consequence of a pro-women redistribution on the



(a) likelihood of conflict

(b) suicide rates

Figure 1: Effect of Pro-Women Redistribution

likelihood of conflict and on the suicide rates of men and women. These are averaged over the different realizations of the levels of private satisfaction. We see that the likelihood of conflict rises over a large range of the division of assets. This increase in conflict is always associated with an increase in male suicides, and sometimes with an increase in female suicides. When conflict decreases, female suicides decline. The female to male suicide ratio declines throughout.

We now turn to an empirical analysis of the link between some specific instances of pro-women redistributions of resources in India and the suicide rates of men and women. We first describe the measures of pro-women redistribution of resources, female inheritance and land rights, that are used in the estimations.

3 Female Property Rights in India

Under traditional Hindu law, women had almost no rights to property ownership. Since 1956, the property rights for all Hindus have been governed by the Hindu Succession Act. *Hindus* in the Act include Sikhs, Jains, and Buddhists, and the Act applies to all states except Jammu and Kashmir -

covering 86% of the Indian population.[15] The Hindu Succession Act of 1956 was aimed at unifying the existing legal doctrines guiding succession and establishing a law of succession whereby sons and daughters would enjoy similar property rights. While the Act significantly enhanced women's inheritance rights (Agarwal 1994), two major sources of inequalities remained: the Act exempted *joint family property* and *tenancy rights*.

Traditional Hindu Law (dating from the 12th century) distinguished between two types of property: *joint* family property versus *separate* property. The former is inherited ancestral property, the latter is purchased or inherited from persons other than father (grandfather, great grandfather, ...). If a man has no sons, his share of ancestral property became his separate property. Under the Hindu Succession Act of 1956, only the separate property of males devolves equally upon sons and daughters.[16] Since 1956, some states amended the Act so that both sons and daughters also have right to joint family property (Kerala in 1976; Andhra Pradesh in 1986; Tamil Nadu in 1989; Maharashtra and Karnataka in 1994). In other states, men remained the sole coparceners in joint family property until 2005. Under the Hindu Succession (Amendment) Act of 2005, all daughters, including married daughters, are coparceners in joint family property. In the empirical estimations that follow, we will be exploiting, these differences across states prior to 2005. We will interpret Amendments to the 1956 Act, which occurred prior to 2005, as a measure of increased inheritance rights for women in those states, for the years that the Amendment was in place (prior to 2005).

The Hindu Succession Act of 1956 was a part of the codification and reform of Hindu personal law which followed Indian Independence. It was an attempt to unify different traditional schools of law which not only varied from region to region but sometimes by caste within regions. Prior to the Act of 1956, inheritance laws were governed by two main schools of Hindu law, *Mitakshara* and *Daydbhaga.* The *Mitakshara* school prevailed in most of India, whereas the *Daydbhaga* school held in Bengal and Assam. Within the *Mitakshara* school, there were also four different sub-schools: *Dravida* (Madras) School in South India, *Maharashtra* (Bombay) School, *Banares* School in Orissa and Bihar, and *Mithila* School in Uttar Pradesh. These diffferent sub-schools differed with regards to their succession laws; the Madras and Bombay sub-schools in particular were somewhat more liberal with regards to recognizing the rights of women (Halder and Jaishankar 2008).[17] This being said, none of these traditional schools gave equal inheritance rights to men and women and the

[15] Tribal communities of the north-eastern states are governed by customary law instead (mainly uncodified).

[16] Also widows and mothers.

[17] These differences primarily pertain to the definition of *stridhan* (the part of the dowry that is the property of brides) and not inheritance laws.

1956 Act was an improvement over all of them. Nevertheless, due to these inherent differences across the traditional schools of law, passing the Act in 1956 turned out to be a huge challenge and subject to much debate at the time (Kishwar 1994). It was by far the most controversial part of the reform to Hindu personal law. The original provisions on succession, framed by the B.N. Rau committee and piloted by Ambedkar in 1947, incorporated the concept of daughters as coparceners in joint family property. These proposals met with a storm of opposition who were not in favor of daughters inheriting property from their natal families at the cost of their brothers. Consistent with the regional differences in the traditional schools of law, it was the northern states who dismissed the more liberal ideas of the southern states, and by a majority vote, the proposed clauses, allowing equal inheritance rights to women, were removed from the Act and the traditional laws were maintained in this regard.

Given this background, it comes as no surprise that the five states which later introduced amendments to the Hindu Succession Act of 1956 were those whose traditional schools of law (the Madras and Bombay sub-schools) were more liberal and also those who agreed to the inclusion of female inheritance rights at the time of passage of the original act but who were shot down in parliament at the time. These later state level amendments included precisely the original provisions framed by the committee in 1947 but were removed from the Act of 1956. This being said, there does not appear to be any systematic reason for the specific years in which these different states enacted their amendments (Kerala in 1976; Andhra Pradesh in 1986; Tamil Nadu in 1989; Maharashtra and Karnataka in 1994). In our empirical analysis, we will be including year and state fixed effects in our estimations. Therefore, the variation we are exploiting is the specific timing of these amendments within each state. We will demonstrate that the timing of these amendments are not correlated with other laws which pertain directly to women. That is, we will demonstrate that our results do not seem to be driven by other confounding changes such as the Dowry Prohibition Act, the Protection from Domestic Violence Act, the State Commission for Women Act, and political reservations for women.

As a further robustness test that it is the change in female property rights which are affecting suicide rates, the regional differences in traditional laws allow for an alternative source of variation in female property rights which we can explore. An additional shortfall of the Hindu Succession Act of 1956 is that it does not cover land ownership stemming from tenancy rights.[18] The Hindu Succession (Amendment) Act of 2005 brought all agricultural land on par with other property.

[18]In some states, the definition of tenant was so broad as to encompass most agricultural land.

But prior to 2005, state tenurial laws governed tenancy rights and several states specified an order of devolution that strongly favors men. Additional laws which governed land ownership in India pertain to landholding restrictions. These landholding limits were defined per family unit, and the states vary in their definition of the family, where in some states daughters receive no recognition at all. Agarwal (1995) discusses the gender inequalities implicit in these state-level land and tenancy reform acts prior to 2005. Using this state level variation in the legal treatment of women with regards to land and tenancy reforms, we will construct alternative measures of pro-female property reforms to use in our empirical analysis.

4 Data

The data for the annual suicides for men and women in each state come from the National Crime Records Bureau of India. The data are available starting in the year 1967 through to the present. Police are expected to investigate all suspected suicides and the final verdict to determine cause of death is then passed to and reviewed by local government officials.[19] The most common means of suicide adopted in India – the ingestion of poison (35%), usually agricultural pesticides, and hanging (32%) account for nearly 70% of suicides (Mayer and Ziaian 2002) – ensure that a substantial amount of cases will come to the attention of the police. Nevertheless, suicides are likely under-reported - for one, suicide is illegal in India. Substantial under-reporting is confirmed by detailed epidemiological studies that find, in some areas, suicide rates are as much as four to six times higher than the official rates (Gajalakshmi and Peto 2007, Joseph et al 2003, Soman et. al. 2009). However, the general patterns of suicide rates in the official data that we will be focusing on in our analysis match those found in these more detailed micro-level analyses. Of particular relevance to our work, roughly the same female to male suicide ratio is found. Moreover, our empirical strategy will be to examine variation in suicide rates across time and state. In particular, we will be exploiting the impact of a legal change in female property rights which varies by state and year in India on annual suicide rates of men and women. In our estimations, we will be controlling for year and state fixed effects, therefore the under-reporting of suicide rates could only be biasing our results if this under-reporting is systematically correlated with one particular legal change across the states.

As discussed, the legal changes we focus on are Amendments to the Hindu Succession Act

[19] Official suicide rates are then estimated off a sample of the population.

of 1956, which vary by year and state until 2005, when the Hindu Succession (Amendment) Act of 2005 was implemented throughout the country. Our period of analysis is therefore, 1967 (the first year that the suicide data are available) to 2004. Suicide rates over this period are shown in Table A1 in the Appendix. Average suicide rates are 11 and 7.3 (per 100,000) for men and women respectively. The male to female suicide rate ratio for the entire period is 1.5. This ratio is much lower than for most Western countries (where it is usually three time as large), and it is close to 1 for the age group 15-29.

For all of our control variables, we use panel data for fifteen major Indian states over the period 1967-2004. Table A1 in the Appendix provides means and standard deviations for the main variables used in the paper. These variables are averaged over the entire period. The data sources are described in more detail in the Appendix.

5 Empirical Analysis

5.1 Basic Results

Our first set of estimations examine the effect of Amendments to the Hindu Succession Act of 1956, which vary by state and year, on male and female suicide rates. As discussed in Section 3, since 1956 some states amended the Act so that both sons and daughters have right to joint family property (Kerala in 1976; Andhra Pradesh in 1986; Tamil Nadu in 1989; Maharashtra and Karnataka in 1994). In other states, men remained the sole coparceners in joint family property until 2005. We use this variation in the Amendments, by state and year, to determine the effect on male and female suicide rates over the period 1967-2004.

The first set of estimating equations is represented by the following:

$$S_{st}^{i} = \beta_0 + \beta_1 X_{st} + \beta_2 A_{st} + \lambda_s + \gamma_t + \varepsilon_{st} \tag{10}$$

Where S_{st}^{i} refers to either the suicide rate of females ($i = F$) or males ($i = M$), per 1000 individuals (of group i), in state s and year t. X_{st} includes a set of state and time varying controls. These include population shares of Muslims, Hindus, Scheduled Tribes and Scheduled Castes; and economic factors such as literacy, relative female to male literacy, food prices, state income per capita, rural food production, yields, the incidence of floods or droughts, average rainfall, banks

per capita, urbanization, and share of state expenditure on heath, development and education. A_{st} is our key variable of interest. It is equal to 1 if state s, in year t, has already passed an Amendment Act which increased inheritance rights to women and 0 otherwise (refer to the Appendix for details on the construction of this variable). λ_s and γ_t are state and year fixed effects respectively, and ε_{st} is a regression disturbance term clustered at the state level.

Fixed effects at the state level control for the usual array of cross state differences in history, family and economic structure that have been constant over our sample period, while the year effects cover macro-shocks, trends in female empowerment and policies enacted by the central government that affect suicide rates.

Table 1 present the regression estimates of (10). Columns 1 and 5 show that, controlling for state and year fixed effects (as well as economic and cultural controls), the Amendments are associated with an increase of 1 suicides (per 100,000) for female and 4 (per 100,000) for males (recall the average suicide rate is 7.3 and 11 (per 100,000) for women and men respectively).

*****Insert Table 1*****

We also estimate (10) for relative female to male suicide rates. We use two measures: the simple difference ($S_{st}^F - S_{st}^M$) and also the ratio (S_{st}^F / S_{st}^M), which implicitly takes into account state and annual variation in the overall suicide rate. Columns 1 and 5 in Table 2 report the results from these estimations. We see, that the Amendments significantly reduce both of these relative measures. That is, although both male and female suicide rates increase with the Amendments (as seen in columns 1 and 5 in Table 1), male suicide rates increase by more. Controlling for state and year fixed effects as well as economic and cultural variables, we see (from Column 5 of Table 2) that the Amendment decreases the female to male suicide ratio by 0.10 (where the average of this ratio is 0.74).

*****Insert Table 2*****

We might expect that the longer a given law has been in place, the higher the awareness is and the more frequently it is enforced. To examine these effects, we use the following estimating equations:

$$S_{st}^i = \beta_0 + \beta_1 X_{st} + \sum_{y=-20}^{30} \gamma_y d(exposure = y)_{st} + \lambda_s + \gamma_t + \varepsilon_{st} \tag{11}$$

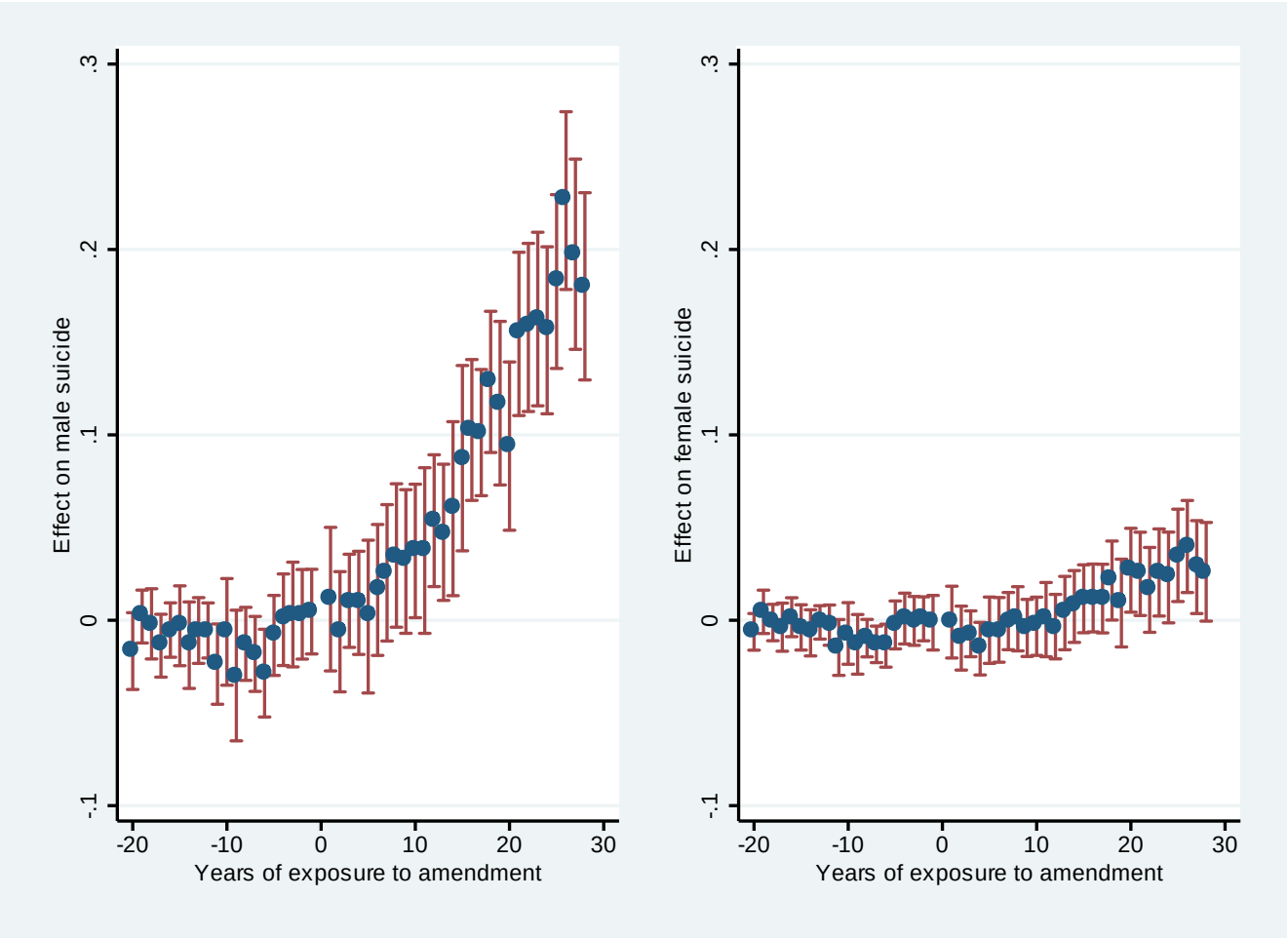


Figure 2: Effect of Years of Exposure.

where $d(exposure = y)_{st}$ is a dummy variable that takes value 1 when there has been y years of exposure to the amendment in state s and year t.

Figure 2 plots the coefficients γ_y from estimating (11) with economic and cultural controls as well as year and state fixed effects. We see that both male and female suicide rates are increasing in the number of years since the Amendment has been passed and that relative female to male suicides are decreasing in this variable. We do not find evidence of these effects abating with time. That is, there is no evidence of a concave relationship between suicides and years since the Amendment has been passed. In addition, we see no evidence that suicide rates started increasing prior to the passage of the Amendments.

As suggested by Figure 2, another set of estimations, reported in Table A3 in the Appendix, uses the years since the Amendment was in place. Though not reported here, the squared term of this variable enters in to all of the estimations insignificantly and alternatively defined dummy variables for different groupings of years since the Amendment has been passed all enter in significantly with a similar sign and the coefficients are increasing in magnitude as the number of years increases.

5.2 Robustness Checks

Tables 1 and 2 also report results from a series of robustness checks on the effect of the Amendments on suicide rates. Columns 3 and 7 (in Table 1) demonstrate that the results are robust to the inclusion of state specific linear time trends for both female and male suicide rates respectively. Though not reported here, the results are also robust to simply including a linear time trend. Columns 3 and 7 of Table 2, demonstrate that the effect of Amendments on relative female to male suicide rates are also robust to the inclusion of state specific linear time trends.

A key concern with our empirical strategy is that the state specific Amendments to the Hindu Succession Act are correlated with other law changes which could impact relative female to male suicide rates or family conflict. Other key laws in India which pertain directly to women are: the Dowry Prohibition Act, the Child Marriage Act, The Prevention of Sati, The Hindu Marriage Act, the Protection of Women from Domestic Violence Act, and the State Commission for Women Act. Of all of these acts, it is only the last which varies at the state level over our time period of consideration. All of the other Acts, were primarily implemented at the national level, and prior to our period of study (i.e., before 1967), or in the case of the Protection of Women from Domestic Violence Act, which was enacted in 2005, after our period of study.[20] The National Commission for Women was set up as a statutory body in 1992 under the National Commission for Women Act of 1990 to review the constitutional and legal safeguards for women. In accord with the national mandate, each state subsequently set up their own Commission for Women. The year in which these committees were formed at the state level varied by year: the first was Maharashtra in 1993 and later ones included Tamil Nadu in 2008 and lastly Haryana in 2012. The estimations in Columns 2 and 6 of Tables 1 and 2, demonstrate that our key results are robust to the inclusion

[20]There were some state level amendments to the Dowry Prohibition Act of 1961 in the the northern states (Haryana, Bihar, Himachal Pradesh, Punjab, West Bengal, and Orissa) in 1975 and 1976. These amendments did not alter the act substantially, rather pointed out clarifications regarding the definition of dowry and the exact amount of fines imposed. Though not reported here, our results are robust to the inclusion of these state level amendments to the Dowry Prohibition Act.

of a variable which is equal to one if this Commission is in place in a given state and year and equal to zero otherwise. In general, we find no significant effects of this variable on female and male suicide rates or the relative rate. This also held true if we only included the Commission variable and not the Amendment variable into the regressions. These state level commissions primarily provide recommendations for legal reform. Unless a change in the legal status of women is actually legislated, we should not expect that the simple existence of these commissions should directly impact family conflict and hence suicide rates of men and women, as is confirmed in the data.

A final consideration are the political reforms which have been in force since the 73rd Amendment to the Indian constitution, which mandated female representation in local governments. Recent work by Iyer et. al. (2012) has demonstrated that this increase in female representation in local governments has lead to a significant rise in documented crimes (primarily kidnappings and rapes) against women. As a check on their results, they looked to crimes where they thought reporting bias is likely to be least like murders and suicides. Their hypothesis is that if reporting bias is not strong, then the reporting of these types of crimes should not be affected by increased female political presence. Indeed, they find no effects - that is, there is no significant relationship between female political representation and female and male suicide rates.

In general there does not seem to be evidence that that other laws, which are aimed at the rights of women, are confounding our key results. A further concern are alternative laws which might be correlated with the Amendments, and which might impact suicide rates more generally, such as those which affect poverty. As stated earlier in Section 3, given the differences in traditional schools of Hindu law, it makes sense that these more liberal states which underwent the Amendments did so before the others. However, there is no systematic explanation for the exact year that each state chose to implement the Amendment. For a given state in India, there are often more than forty enactments passed every year. If we restrict ourselves to only those which are applicable to the whole state, at least five are typically passed in any given year. For our five key states of interest (who imposed early Amendments to the Hindu Succession Act), there are no other enactments that occurred simultaneously in each of these states. That is, Kerala passed the Amendment to the Hindu Succession Act in 1976. That same year in Kerala, a tax on luxuries in hotels and lodging was imposed, as well as enactments regarding pension payments to members of the legislature, restrictions on the supply of paddy and rice to Travancore Palace, and the dissolution of municipal co-op pharmacies. None of these enactments that occurred alongside the Amendment to the Hindu Succession Act in Kerala in 1976 also occurred alongside the corresponding Amendments in the other states in their respective years. That is to say, there is no specific law change (other than the

Amendment) that happened specifically in 1976 in Kerala, 1986 in Andhra Pradesh, 1989 in Tamil Nadu, and in 1994 in Maharashtra and Karnataka. This was also the case for enactments imposed a couple of years prior to these dates in all of the states. Hence, there is no evidence of a particular enactment that was passed at the same time as the Hindu Succession Act in our different states of interest.

To confirm this, we ran a series of placebo tests. Columns 4 and 7 of Tables 1 and 2 report the estimation results from these tests. In these estimations we include additional dummy variables, denoted A_{st-2}, A_{st-3}, A_{st-5}, and A_{st-7} which are equal to 1 for all years greater or equal to $t-2$, $t-3$, $t-5$, and $t-7$ respectively if state s passed the Amendment Act in year t and zero otherwise. If it is indeed the effects of the Amendment that we are picking up in our estimation of (10), then we should expect that the estimated coefficient on these additional dummy variables to be insignificant in the estimations. We see from the results that this is the case: the effects of the Amendment are only significant for the years when the Amendment was actually passed, and not significant if we *pretend* the Amendment was passed instead 2, 3, 5, or 7 years prior. This held true for a number of other empirical specifications, where the placebo years are differently defined, or if we enter the different dummy variables, A_{st-2}, A_{st-3}, A_{st-5}, and A_{st-7}, into the estimations independently instead of all together.

An additional set of estimations, reported in Table A4 in the Appendix, excludes the state of Kerala. This state is distinct for many reasons, not only because it was the first to pass the Amendment Act but also it has the highest overall suicide rates in the country. Moreover it is an anomaly in India with regards to the status of women, along many positive dimensions. The second set of estimations in Table A4 exclude the three states (Bihar, Punjab, and Uttar Pradesh), where the average suicide rates for both men and women have been decreasing through time. In addition, these three states have the lowest overall suicide rates in the country.

5.3 Instrumental Variables Estimations

In the regression estimates presented so far, there is possibly still a concern that unobservables determine both suicides and property legislation. Given the evidence presented in the prior section, there does not appear to be any alternative policy changes that could be confounding our results. However, there is still possibly the concern that the Amendments are correlated with some unobservable factor which also determines suicide rates or household conflict, like a poverty shock. This

does seem unlikely given the variation we are exploiting here. Again, there would have to be some unobservable factor which is specifically relevant in 1976 for Kerala, 1986 for Andhra Pradesh, 1989 for Tamil Nadu, and in 1994 for both Maharashtra and Karnataka. This being said, to address this issue we attempt to instrument for these legislations. We follow the strategy of Besley and Burgess (2000) who conjecture that different groupings in the state legislature enact different Amendments and Acts. Specifically, we use the seat shares of different political groups, lagged by one period, as instruments. The results are robust if we instead use later lags. This likely follows because these seat shares remain constant though a given election cycle. The assumption here is that lagged political variables determine current legislation but not current unobservable factors which determine suicide rates. In other words, we are assuming that contemporaneous shocks which determine suicide rates are uncorrelated with shocks that lead to particular groups being elected previously.

To correspond to the set of estimations represented by (10), this empirical strategy implies a first-stage estimation:

$$A_{st} = \gamma_0 + \gamma_1 X_{st} + \gamma_2 Z_{st-1} + \varphi_s + \psi_t + \eta_{st} \tag{12}$$

where Z_{st-1} are the political variables reflecting the seat shares of different political groups, each lagged by one period. These are constructed from data from the Election Commission of India who record the number of seats won by different parties in each state election (see the Appendix for details).

The first stage estimation results are presented in the first column of Table 3 below. It shows that state parties and the Congress party were more likely than Hindu parties to pass Amendments to the Inheritance Law while the soft left parties were less likely to pass them (the F-test on the instruments is about 10). Columns 2 to 5 show that, controlling for cultural and economic factors, the results of Tables 1 and 2 remain robust to this instrumenting strategy. That is, the Amendments increased both female and male suicide rates, but increased that of males by more, where the magnitude of the coefficients in these IV estimations are larger than those in the OLS estimations.

*****Insert Table 3*****

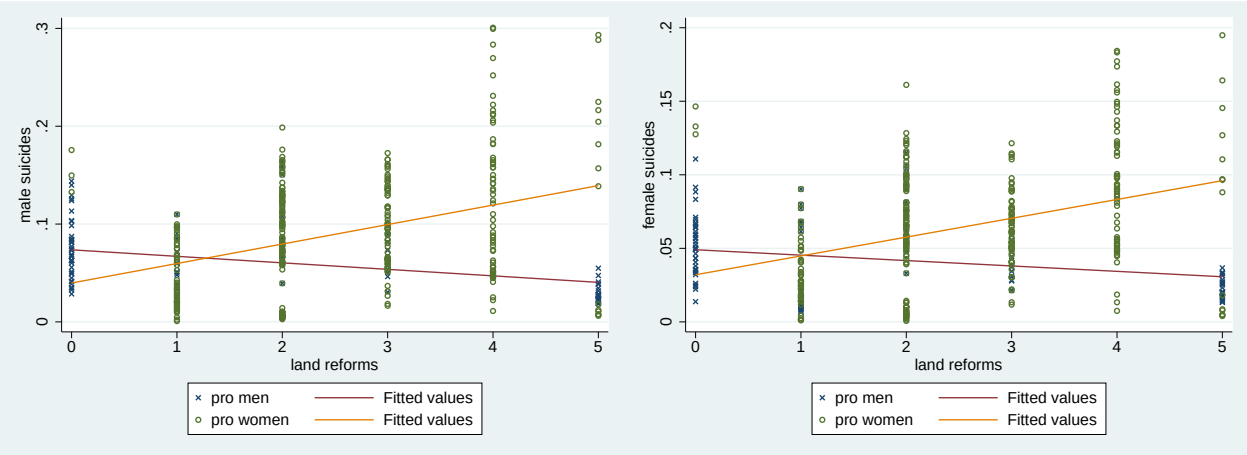
5.4 Alternative Property Rights Measures

In this section we consider an alternative measure of property rights for women. The previous estimations pertain to variation across states and time with regards to legislating Amendments to the Hindu Succession Act which granted sons and daughters similar rights to joint family property. However, there are additional laws which govern land ownership in India which pertain to tenancy rights and landholding restrictions.[21] Agarwal (1995) discusses the gender inequalities implicit in these state-level land and tenancy reform acts. The succession rules relating to land held under tenancy are different than the personal laws. In a subset of states, devolution of tenancy land is only to male heirs. In other states, daughters and sisters are recognized but come very low in the order of heirs. In the remaining states, personal law applies to tenancy land and women have some rights over the land. Landholding laws are defined by the maximum landholding per family unit and the states vary in their definition of family. In some states, the family constitutes the cultivator and his/her spouse, sons, and unmarried daughters. In other states, the family unit includes all children (married or not). In many states, adult sons receive special consideration and the parental household can hold additional land on account of each adult son. In other states, adult sons, count as a separate unit and are entitled to hold land in their own right. In many of these enactments, unmarried adult daughters receive no recognition at all, they do not count either as part of the family unit or as a separate unit and in other states, married daughters do not receive recognition.

Using this state level variation in the legal treatment of women, we construct alternative measures of pro-women property reforms. In particular, we use the cumulative indexes of state-level landholding and tenancy reforms used by Besley and Burgess (2000). We then interact these measures with an index which captures the degree to which these reforms favoured women in accord with Agarwal (1995).

Our key variables of interest are represented by L_{st}, T_{st}, $FL_s * L_{st}$ and $FT_s * T_{st}$. L_{st} is a cumulative index of state-level landholding reforms, and T_{st} is a cumulative index of tenancy reforms. Both of these are constructed from the data used by Besley and Burgess (2000), see the Appendix for details. FL_s is an index of the degree to which these landholding reforms favored women in accord with Agarwal (1995). $FL_s = 1$ if married and unmarried daughters receive no recognition; $FL_s = 2$ if married but not unmarried daughters receive recognition; and $FL_s = 3$ if unmarried and married daughters receive recognition. FT_s is an index of the degree to which

[21] The Hindu Succession Act covers only owned agricultural land and does not cover land stemming from tenancy rights.



(a) Male (b) Female

Figure 3: Effect of Land Reform

these tenancy reforms favored women in accord with Agarwal (1995). $FT_s = 1$ if the devolution of tenancy land is only to male heirs; $FT_s = 2$ if daughters and sisters are recognized but come very low in the order of heirs; $FT_s = 3$ if personal law applies to tenancy land and women have some rights over the land. δ_s and θ_t are state and year fixed effects respectively, and ϵ_{st} is a regression disturbance term clustered at the state level.

We first illustrate the effect of land reform with a simple plot. Figure 3 plots the suicide rates (male in panel (a) and female in panel (b)) on the cumulative land and tenancy reforms ($L_{st} + T_{st}$) depending on whether these reforms also benefit women (defined as $FL_s + FT_s >= 3$) or not. We see clearly a positive correlation between suicide rates and cumulative land reform when these reforms also benefits women but not when these reforms predominantly benefit men.

We then look at these effects controlling for state and year fixed effects as well as our set of state and time varying controls X_{st}. Specifically, we estimate:

$$S^i_{st} = \alpha_0 + \alpha_1 X_{st} + \alpha_2 L_{st} + \alpha_3 FL_s * L_{st} + \alpha_4 T_{st} + \alpha_5 FT_s * T_{st} + \delta_s + \theta_t + \epsilon_{st}. \tag{13}$$

The estimation results of (13) are reported in Table 4. We see that a similar picture emerges when considering these alternative measures of pro-women reforms. While the overall cumulative landholding and tenancy reforms reduce both male and female suicide rates, the effect varies widely

depending on whether these reforms favor men or women. Landholding reforms that benefits mainly (rate 1 on the pro-women scale) reduce female suicides by 4 (per 100,000) and male suicides by 8 (per 100,000), whereas landholding reforms that rate 2 on our pro-women scale only reduces male and female suicide by 1 (per 100,000). Similarly, the most pro-male tenancy reforms (which rate 1 on our pro-women scale) prevent 1 female and 2 male suicides (per 100,000), while tenancy reforms that rate 2 on our pro-women scale have no effect on the suicides rates. In both cases, the effects of the interaction terms (α_3 and α_5) are positive and significant in all estimations and larger for male suicide rates. Columns 5 and 6 of Table 4 present the estimates of the effects that these pro-female land reform measures have on the relative suicide rate of women to men, measured as the difference ($S_{st}^F - S_{st}^M$) and also the ratio (S_{st}^F / S_{st}^M). Consistent with our earlier estimations, we see that landholding and tenancy reforms which favor men (women) increase (decrease) relative female to male suicide rates.

*****Insert Table 4*******

5.4.1 Instrumental Variables Estimations

Finally, we also estimate an IV specification of (13). In a two-stage estimation, where the second-stage estimates are represented by (13), we need to instrument for both, the cumulative indexes of reforms, L_{st}, and T_{st}, as done in Besley and Burgess (2000), and also their interaction with the female oriented policy indices, $FL_s * L_{st}$ and $FT_s * T_{st}$. To this end, as recommended by Angrist and Pischke (2009, p. 191), we first estimate the following:

$$L_{st} = \delta_0 + \delta_1 X_{st} + \delta_2 Z_{st-1} + \pi_s + \sigma_t + \mu_{st} \tag{14}$$

$$T_{st} = \theta_0 + \theta_1 X_{st} + \theta_2 Z_{st-1} + \phi_s + \alpha_t + \upsilon_{st} \tag{15}$$

Where X_{st} and Z_{st-1} are the same variables defined in (12). We then use the predicted values, $\widehat{L}_{st}$ and $\widehat{T}_{st}$, from (14) and (15) respectively, and their interactions with the female policy index, $FL_s * \widehat{L}_{st}$ and $FT_s * \widehat{T}_{st}$, as instruments in the four first-stage estimations of L_{st}, T_{st}, $FL_s * L_{st}$ and $FT_s * T_{st}$ in a conventional 2SLS procedure:

$$L_{st} = \lambda_0 + \lambda_1 X_{st} + \lambda_2 \widehat{L}_{st} + \lambda_3 FL_s * \widehat{L}_{st} + \tau_s + \chi_t + \iota_{st} \tag{16}$$

$$FL_s * L_{st} = \rho_0 + \rho_1 X_{st} + \rho_2 \widehat{L}_{st} + \rho_3 FL_s * \widehat{L}_{st} + \omega_s + \delta_t + \zeta_{st} \tag{17}$$

$$T_{st} = \pi_0 + \pi_1 X_{st} + \pi_2 \widehat{T}_{st} + \pi_3 FT_s * \widehat{T}_{st} + \gamma_s + \phi_t + \xi_{st} \tag{18}$$

$$FT_s * T_{st} = \sigma_0 + \sigma_1 X_{st} + \sigma_2 \widehat{T}_{st} + \sigma_3 FT_s * \widehat{T}_{st} + \kappa_s + \pi_t + \varrho_{st} \tag{19}$$

The first columns in Table 5 and 6 show that political variables are strongly significant determinants of landholding and tenancy reforms (F-tests of about 30 and 20 respectively). In particular, hard left parties increase the likelihood of these reforms.

Columns 4 and 5 in Table 5 show that landholding reforms have large effects on suicides. Pro-male landholding reforms significantly decreased male and female suicide rates, while pro-female landholding reforms (by one unit) have on average *half* the reducing effects. The remaining two columns show similar results for the relative female to male suicide rates, where again, pro-female landholding reforms increase this relative measure by roughly half.

*****Insert Table 5******

Table 6 reports the analogous results for the tenancy reforms. We see very similar relationships between pro-female tenancy reforms and suicide rates. Taken together these results demonstrate a very consistent picture. Improving female property rights *raise both* female and male suicides, but more the latter so that the relative female to male suicide rates decrease.

*****Insert Table 6******

5.5 Family Conflict as a Channel

Our theoretical model in Section 2 suggested that pro-women changes in property rights can raise suicide rates by raising family conflicts. In this Section, we investigate evidence for this channel.

According to the National Crime Records Bureau Reports on suicides, based on police investigations of the deaths, roughly 70 percent of the individuals who commit suicide are married and

fall into the age group of 15-44. Suicide victims are more likely to be educated (only about 20 percent have no education). For women, about 55 percent are housewives. These similar patters are borne out in the more careful micro-level studies (Gouda and Rao 2008, Mohanty et. al. 2006, Patel et. al. 2012).[22]

The broad class of "family problems" accounts for the single largest cause of suicides irrespective of gender in the national level data. More specifically, this category refers to quarrels with spouse, parents, or in-laws and accounts for the majority of suicides among the 15 to 44 age group for both males and females. Illness is the second most important cause associated with suicides (this does not typically refer to mental illness but more commonly to a serious (likely terminal) illness) and accounts for the majority of suicides for individuals aged 60 and over. Other causes like poverty, bankruptcy, and dowry disputes are cited as the causes of only 2 to 3 percent of suicides respectively. Again, these relationships are also found in the micro-level studies which point to marital disharmony as a main cause of suicide (Mohanty et al. 2006, Gouda and Rao 2008).

Given that the majority of suicides seem to be due to family conflict, we now test to see if the effects of the Amendments on suicide rates, found in the earlier section, are determining this particular cause of suicides. To this end, Table 7 (column 1) reports results from analogous estimations to (10), where the dependent variable is instead the suicide rate from family problems for females and males. We see that, as before, the Amendment Acts (which increased inheritance rights for women) significantly increase both these male and female suicide rates, where the estimated coefficient is larger for males. Column 2 of Table 7 reports results from analogous estimations where the dependent variable is instead the suicide rate from other causes (i.e., not family conflict). We see that in this case the Amendment Acts have no significant impact on these suicide rates. Table 7 also reports results where the dependent variable is instead the proportion of total suicides which are due to family problems, for both males and females. Columns 3 reports this proportion, relative to all suicides, by gender. We see that, consistent with the previous findings, the Amendment Acts significantly increase the proportion of suicides due to family problems for both males and females. Columns 4 report this proportion relative to total suicides only where the cause is known. We see that the main results persist and that the estimated effects are large, where the increase in the proportion of suicides attributed to family problems is more than 25 percent for both males and

[22]These studies are typically conducted by health care workes and rely on verbal autopsy data. Soman et. al. (2009), for example, performed a cohort study where villages were visited repeatedly for five years. Each reported death was investigated by local health care workers as well as a physician who conducted a validation study of each death and a detailed inquiry of household and village members.

females.

*****Insert Table 7******

The fact that it is male and female suicides caused by family problems and martial disharmony that have increased with the Amendment Acts, we conjecture that increasing female property rights increased conflict within household and that this increased conflict resulted in more suicides among both men and women. We now turn to an alternative data set to test this conjecture more directly. We use individual level data from the recent National Family Health Survey of India (NFHS-3 collected in 2005), which comprises detailed information on violence against women collected from married women aged 15 to 49.

Importantly the early Amendments to the Hindu Succession Act do not apply to women who were married prior to the commencement of the Amendments. For these women, their inheritance rights are dictated by the laws implace prior to the Amendment (refer to Agarwal (1995) for details). We can exploit this application of the law to uncover the effects of the Amendment on individual women within a give state. That is, we can compare outcomes of women who were married before the Amendment to those who were married after the Amendment.

In particular, we estimate the following:

$$Y_{is} = \psi_0 + \psi_1 X_{is} + \psi_2 A_{is} + m_{is} + \alpha_s + \varepsilon_{is}. \tag{20}$$

Where Y_{is} is a domestic violence outcome variable for an individual female i residing in state s. Y_{is} takes on a value of 1 if a given female i (residing in state s) has been physically abused by her husband, and zero otherwise. Roughly 28 percent of women in our sample have been beaten by their husbands. X_{is} is a vector of individual and household control variables which include: education, age, and occupation of wives and their husbands; caste and religion of wives; household location (rural or urban); and household durable good ownership. Table A2 in the Appendix presents summary statistics on these variables. m_{is} is year of marriage and α_s are state fixed effects. Our key independent variable of interest A_{is}, is equal to 1 for those women who reside in states where the Amendment has been passed *and*.they were married after the Amendment was passed. It is equal to zero otherwise. That is, A_{is} is equal to zero for those women in these states who were married before the Amendment was passed and for all women who reside in states where no Amendment was passed prior to the year 2005.

Table 8 reports the estimation results of (20). Using the whole sample, Column 1 demonstrates that, consistent with our conjecture, the effect of the Amendments (measured by A_{is}) is positive and significant on the probability that a wife is beaten by her husband. Recall that the Hindu Succession Act only applies to the hindu population. Therefore, we should see no effects of the Amendment for other religious groups. We test this in Columns 2 to 6 in Table 8. We see that the significant positive effects of the Amendment on the incidence of domestic violence is only relevant for Hindus - there are no significant positive effects for Muslims or Christians. We first show this (Columns 2 to 4) by estimating (20) separately for the different groups: Hindus, Muslims, and Christians respectively. Column 5 instead estimates (20) over the entire sample and also includes interaction effects between our key variable of interest, A_{is}, and dummy variables for the different religious groups. Again, we find no significant positive interaction effects for Muslims and Christians. The final column demonstrates that this result is robust if we just limit the sample to those states which passed the Amendment. These results suggest that, increasing property rights in favor of women, can lead to more violence against women.

*****Insert Table 8*****

6 Discussion

6.1 Other Possible Explanations

Our data do not allow us to directly test whether the above explanation is the actual channel through which improvements in property rights increased suicide rates in India. Other explanations are possible.

For instance, it might be that conflict between brothers and sisters, not husbands and wives, increased as a result of the reforms. This would not change the way we think about this theoretically, as we can use the above framework to model bargaining between a sister and a brother over assets I.[23] However, we think that it is less likely to be a main explanation as in micro-studies of suicides mentioned in Section 4 marital disharmony was cited as a main trigger while dispute among siblings was not.

[23] I_j would be the assets that j is entitled by law, x the division of assets, and θ_j the value that j attaches to the relationship with his or her sibling.

Another possibility is that, following the reform, some men pushed women to suicide to obtain their resources. Note though that this would only explain the increased female suicide and therefore needs to be combined with another explanation.[24]

6.2 Policy Implications

In terms of policy implications, we are certainly not recommending to keep inheritance rights unequal between men and women. Though our paper highlights some of the negative implications of women empowerment, it is important to stress that, as in the model presented in the previous section, we do expect that women are made ex-ante better off by more equitable property rights.

What our model suggests is policies that decrease the cost of conflict by easing separations for instance. In the US, Stevenson and Wolfers (2006) found that states that adopted more liberal laws permitting "unilateral divorce" reported a 8 to 16 percent decline in female suicide, roughly a 30 percent decline in domestic violence for both men and women, and a 10 percent decline in females murdered by their partners. In India, the Marriage Laws (Amendment) Bill in 2012 made divorce proceedings for unhappy couples easier and women-friendly, but stigma as well as norms in terms of child custody and alimony still make separation extremely hard in practice.

7 Conclusion

Our paper has demonstrated a positive relationship between better property rights for women and female and male suicide rates in India. We conjecture that increased marital conflict could be the main channel through which improving female property rights raise suicides. Our findings are consistent with the sociological literature, which emphasizes how increased gender equality can accentuate tensions and distress within households - leading to a greater incidence of male and female suicides. The empirical accounts from industrialized countries suggest that this dire consequence of increased opportunities for women may be mitigated once societal institutions adjust and there is a greater acceptance of the new gender roles.

[24]Moreover, following concerns over dowry violence, when a woman commits suicide within 7 years of her married life, her husband quickly comes under suspicion. That is, if there is evidence that her husband or his relatives had treated her with cruelty, it would be presumed by the Court that her husband or relatives had aided (abetted) her suicide (Section 113 A of the Indian Evidence Act).

Of course, from a policy perspective, one would never want to advocate reducing gender equality on a account of its link to suicide rates. Rather, the evidence provided here contributes more to the sociological literature which focuses on the profound sociological significance of the unprecedented rise in women's empowerment and its effect, both negative and positive, on a variety of social dimensions. By contrast, the economic literature on behavior in the household, has mainly focused on the positive effects of increasing women's outside options. By explicitly considering costly conflict in the household, we demonstrate some more subtle features of increased bargaining power of women.

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Table 1 - Suicide Rates and Female Inheritance - OLS Estimations

	Female				Male			
Variable		Women Commission	State specific linear time trends	Placebo Test		Women Commission	State specific linear time trends	Placebo Test
Amendment	0.01 (0.005)***	0.01 (0.005)***	0.01 (0.004)***	0.01 (0.003)***	0.04 (0.01)***	0.04 (0.01)***	0.02 (0.007)***	0.05 (0.009)***
Commission		0.001 (0.004)				0.01 (0.01)		
Amendment-2 years				0.007 (0.006)				0.017 (0.010)
Amendment -3 years				0.005 (0.007)				0.017 (0.017)
Amendment.-5 years				-0.0006 (0.006)				0.0007 (0.007)
Amendment -7 years				0.01 (0.007)				0.009 (0.011)
Cultural Controls	YES	YES	YES	YES	YES	YES	YES	YES
Econ. Controls	YES	YES	YES	YES	YES	YES	YES	YES
Observations	525	525	525	525	525	525	525	525

Notes: All regressions have state and year controls. Standard errors are clustered at the state level. A single asterix denotes significance at the 10% level, double for 5%, and triple for 1%. Cultural controls include population shares of Muslims, Hindus, Scheduled Tribes and Scheduled Castes. Economic controls include literacy rates, relative female to male literacy rates, food prices, state income per capita, rural food production, yields, the incidence of floods or droughts, average rainfall, banks per capita, urbanization, and share of state expenditure on heath, development and education.

Table 2 - Relative Female and Male Suicide Rates and Female Inheritance

	Female-Male				Female/Male			
Variable		Women Commission	State specific linear time trends	Placebo Test		Women Commission	State specific linear time trends	Placebo Test
Amendment	-0.03 (0.008)***	-0.03 (0.009)***	-0.01 (0.004)**	-0.03 (0.009)***	-0.10 (0.04)***	-0.09 (0.04)***	-0.07 (0.02)***	-0.09 (0.04)**
Commission		-0.01 (0.009)				-0.03 (0.05)		
Amendment -2 years				-0.01 (0.01)				-0.006 (0.03)
Amendment -3 years				-0.01 (0.01)				-0.007 (0.03)
Amendment -5 years				-0.001 (0.002)				0.01 (0.03)
Amendment -7 years				0.002 (0.006)				-0.01 (0.04)
Cultural Controls	YES	YES	YES	YES	YES	YES	YES	YES
Economic Controls	YES	YES	YES	YES	YES	YES	YES	YES
Observations	525	525	525	525	525	525	525	525

Notes: All regressions have state and year controls. Standard errors are clustered at the state level. A single asterix denotes significance at the 10% level, double for 5%, and triple for 1%.

Table 3 - Suicides and Female Inheritance- IV-2SLS Estimations

Variable	*First-Stage* Amendment	Female Suicides	Male Suicides	Female-Male Suicides	Female Suicides / Male Suicides
Amendment		0.04 (0.01)***	0.10 (0.03)***	-0.06 (0.02)***	-0.45 (0.13)***
Hard Left	-0.13 (0.17)				
Soft Left	-0.67 (0.16)***				
State Parties	0.34 (0.12)***				
Congress	0.15 (0.07)**				
Cultural Controls	YES	YES	YES	YES	YES
Economic Controls	YES	YES	YES	YES	YES
F-stat on Instruments	10.30				
Observations	486	485	485	485	485
$\overline{R}^2$	0.68	0.91	0.89	0.87	0.62

Notes: All regressions have state and year controls. Robust standard errors are in parentheses. A single asterix denotes significance at the 10% level, double for 5%, and triple for 1%.

Table 4 - Suicides and Female Land Reforms- OLS Estimations

Variable	Female	Female	Male	Male	Female-Male	Female/Male
Landholding Acts	-0.09 (0.008)***	-0.07 (0.009)***	-0.20 (0.03)***	-0.15 (0.03)***	0.08 (0.03)***	0.32 (0.10)***
Tenancy Acts	-0.02 (0.006)***	-0.02 (0.004)***	-0.04 (0.007)***	-0.04 (0.01)***	0.02 (0.005)***	0.20 (0.08)**
Female*Landholding Acts	0.04 (0.004)***	0.03 (0.004)***	0.09 (0.01)***	0.07 (0.02)***	-0.04 (0.01)***	-0.12 (0.04)***
Female*Tenancy Acts	0.01 (0.003)***	0.01 (0.003)***	0.02 (0.004)***	0.02 (0.006)***	-0.01 (0.003)***	-0.09 (0.03)**
Cultural Controls	NO	YES	NO	YES	YES	YES
Economic Controls	NO	YES	NO	YES	YES	YES
Observations	472	407	472	407	407	402
$\overline{R}^2$	0.91	0.94	0.92	0.94	0.92	0.58

Notes: All regressions have state and year controls. Standard errors clustered at the state level are in parentheses. A single asterix denotes significance at the 10% level, double for 5%, and triple for 1%. In all of the estimations the years covered are 1967-2000.

Table 5 - Suicides and Female Landholding Acts- IV-2SLS Estimations

Variable	*First-Stage* Landholding	*First-Stage* Landholding	*First-Stage* Female*Landhold.	*Female* Suicides	*Male* Suicides	Female-Male Suicides	Fem. Suicides / Male Suicides
Landholding Acts				-0.07 (0.04)*	-0.19 (0.07)***	0.12 (0.04)***	0.72 (0.45)†
Female*Landhold.				0.04 (0.01)***	0.10 (0.03)***	-0.06 (0.02)***	-0.27 (0.18)†
Hard Left	3.20 (0.65)***						
Soft Left	-3.03 (0.50)***						
State Parties	-0.87 (0.18)***						
Congress	-0.17 (0.11)						
$\widehat{Landholding}$		-0.58 (0.18)***	-0.86 (0.45)**				
Female*$\widehat{Landhold.}$		0.53 (0.07)***	0.95 (0.17)***				
Cultural Controls	YES	YES	YES	YES	YES	YES	YES
Economic Controls	YES	YES	YES	YES	YES	YES	YES
F-stat on Instruments	30.5	45.7	23.4				
Observations	441	411	380	380	380	380	290
$\overline{R}^2$	0.92	0.94	0.92	0.92	0.93	0.92	0.72

Notes: All regressions have state and year controls. Robust standard errors are in parentheses. A single asterix denotes significance at the 10% level, double for 5%, and triple for 1%. † refers to significance at the 13% level. In this final estimation the sample is restricted to the years 1967-1992 (the orginal Besley-Burgess data set), for all of the other estimations the sample is the years 1967-2000. .

Table 6 - Suicides and Female Tenancy Acts- IV-2SLS Estimations

Variable	*First-Stage* Tenancy	*First-Stage* Tenancy	*First-Stage* Female*Tenancy	Female Suicides	Male Suicides	Female-Male Suicides	Fem. Suicides / Male Suicides
Tenancy Acts				-0.03 (0.006)***	-0.05 (0.01)***	0.02 (0.008)***	0.20 (0.08)**
Female*Tenancy				0.02 (0.004)***	0.03 (0.007)***	-0.01 (0.005)**	-0.09 (0.04)**
Hard Left	5.65 (0.92)***						
Soft Left	0.67 (0.89)						
State Parties	-0.86 (0.20)						
$\widehat{Tenancy}$		1.74 (0.28)***	2.62 (0.62)***				
Female*$\widehat{Tenancy}$		-0.42 (0.13)***	-0.36 (0.29)				
Cultural Controls	YES	YES	YES	YES	YES	YES	YES
Economic Controls	YES	YES	YES	YES	YES	YES	YES
F-stat on Instruments	19.6	26.1	20.3				
Observations	437	407	407	406	406	406	406
$\overline{R}^2$	0.92	0.93	0.93	0.94	0.93	0.91	0.78

Notes: All regressions have state and year controls. Robust standard errors are in parentheses. A single asterix denotes significance at the 10% level, double for 5%, and triple for 1%. In all of the estimations the years covered are 1967-2000.

Table 7 - Suicide Rates from Family Conflict and Female Inheritance- OLS Estimations

Variable	Suicide Rate Family Conflict	Suicide Rate Other Causes	Proportion Suicides Family Conflict (All Suicides)	Proportion Suicides Family Conflict (Cause Known)
Female:				
Amendment	0.006 (0.003)**	-0.012 (0.009)	0.07 (0.03)**	0.19 (0.08)**
Male:				
Amendment	0.01 (0.004)**	-0.005 (0.11)	0.05 (0.02)**	0.06 (0.02)**
Cultural Controls	YES	YES	YES	YES
Economic Controls	YES	YES	YES	YES
Observations	442	442	442	442

Notes: All regressions have state and year controls. Robust standard errors clustered at the state level are in parentheses. A single asterix denotes significance at the 10% level, double for 5%, and triple for 1%.

Table 8 - Domestic Violence and Female Inheritance (NFHS) - Probit Estimations

Variable	Whole Sample	Hindus	Muslims	Christians	Whole Sample	Amended States
Exposed to Amendment	0.09 (0.02)***	0.09 (0.02)***	0.08 (0.07)	0.06 (0.14)	0.10 (0.02)***	0.14 (0.03)***
Exposed to Amendment*Muslim					-0.14 (0.05)***	-0.09 (0.06)
Exposed to Amendment*Christian					0.02 (0.08)	-0.03 (0.10)
Individual Controls	YES	YES	YES	YES	YES	YES
Household Controls	YES	YES	YES	YES	YES	YES
Observations	60687	51735	7610	1221	60687	23053
$\overline{R}^2$	0.06	0.06	0.07	0.12	0.06	0.07

Notes: The dependent variable equals to one if a wife has been beaten by her husband and zero otherwise. All regressions have state fixed effects. Individual and household controls include: year of marriage, education, age, and occupation of both wives and their husbands; caste and religion of wives; household location (rural or urban); and household durable good ownership. Exposed to Amendment is a dummy variable equal to one if the woman was married after the Amendment had been passed in her state and equal to zero otherwise Robust standard errors clusterd at the regional level are in parentheses. A single asterix denotes significance at the 10% level, double for 5%, and triple for 1%.

8 Appendix

8.1 Data Sources

Dependent Variables: Suicide numbers by gender and cause come from National Crime Records Bureau of India.

Instrumental Variables: Political variables come from Election Commission of India.

Cultural Controls: Population, religion, and caste data come from decennial census published in the Annual Statistical Abstract of India. Variables are interpolated between censuses.

Economic Controls:

State expenditure data, rainfall, drought and flood information comes from the EOPP Indian States Data Base at STICERD, London School of Economics.

Bank availability come from the Burgess and Pande (2005) data set.

8.2 Variable Definitions

State Dummies: States included: Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal.

Year Dummies: Years covered 1967-2004

Female Inheritance Amendments: $A_{st} = 1$ for $t \geq 1976$ for Kerela; $A_{st} = 1$ for $t \geq 1986$ for Andhra Pradesh; $A_{st} = 1$ for $t \geq 1989$ for Tamil Nadu; $A_{st} = 1$ for $t \geq 1994$ for Maharashtra and Karnataka; and $A_{st} = 0$ otherwise.

Land Reform Indexes: L_{st} is the cumulative number state-level legislations regarding landholdings. These include legislations which implemented ceilings on landholdings (Type 3 in the Besley-Burgess data); and acts that consolidated disparate landholdings (Type 4 in the Besley-Burgess data). T_{st} is the cumulative number of state-level legislations regarding tenancy rights. These include acts

which regulate tenancy contracts, abolish tenancy, and transfer ownership to tenants (Type 1 in the Besley-Burgess data); and acts which attempt to abolish intermediaries (Type 2 in the Besley-Burgess data). In accord with the Besley-Burgess data, amendments to the acts count as new legislations.

FT_s is an index which increases in the rights women have regarding tenancy acts. Using the information in from Table 2 in Agarwal (1995) , we code this: $FT_s = 1$ if the devolution of tenancy land is only to male heirs {Punjab, Uttar Pradesh, Jammu and Kashmir, Haryana, Himachel Pradesh}; $FT_s = 2$ if daughters and sisters are recognized but come very low in the order of heirs {Bihar, Gujarat, Maharashtra, Orissa, West Bengal, Andhra Pradesh, Karnataka, Kerela, Tamil Nadu}; $FT_s = 3$ if personal law applies to tenancy land and women have some rights over the land {Rajasthan, Madhya Pradesh}.

FL_s is an index which increases in the rights women have regarding landholding acts. Using the information in from Table 3 in Agarwal (1995) , we code this: $FL_s = 1$ if married and unmarried daughters receive no recognition {Punjab, Rajasthan, Uttar Pradesh, Andhra Pradesh, Haryana}; $FL_s = 2$ if married but not unmarried daughters receive recognition {Bihar, Assam, Gujarat, Madhya Pradesh, Maharashtra, Orissa}; $FL_s = 3$ if unmarried and married daughters receive recognition {Jammu and Kashmir, Karnataka, Kerela, Tamil Nadu, West Bengal}.

Political Variables: Z_{st-1} includes the proportion of seats in the state legislatures (Vidhan Sabha) held by Hard Left (Communist Party of India; Communist Party of India Marxist Parties); Soft Left (Indian National Congress Socialist Parties); Congress (Indian National Congress; Indian National Congress Urs); and State Parties (Teluga Desam; Assam Gana Parishad; Shiv Sena; Uktal Congress; Shiromani Alkali Dal; Dravida Munnetra Kazhagam).

Domestic Violence Variables: Y_{is} reflects the dependent variable of whether a wife has been beaten by husband, it takes on a value of 1 if a woman has ever been physically abused by her husband.

Female Inheritance Amendment (Individual level regressions): Let A_s denote the year that the Amendment was passed in state s (i.e., A_s=1976 for Kerala; A_s=1986 for Andhra Pradesh; A_s=1989 for Tamil Nadu; A_s=1994 for Maharashtra and Karnataka). Then we define A_{is} as follows. $A_{is} = 1$ if *year married* $\geq A_s$; or $A_{is} = 0$ if *year married* $< A_s$. $A_{is} = 0$ for all of the states where no Amendment was passed prior to the year 2005. .

8.3 Summary Statistics

Table A1 - Summary Statistics (across all years and states)

Variable	Mean (s.d.)
Female Suicide Rate	0.073 (0.048)
Male Suicide Rate	0.11 (0.085)
Female Suicide Rate - Male Suicide Rate	-0.35 (0.05)
Female Suicide Rate/Male Suicide Rate	0.74 (0.23)
Hindus (share of population)	0.827 (0.154)
Muslims (share of population)	0.152 (0.173)
Schedule Tribes (share of population)	0.074 (0.074)
Schedule Castes (share of population)	0.151 (0.058)
Literacy rate	49.0 (16.2)
Female literacy/Male literacy	0.58 (0.15)
Real State Domestic Product per capita (log)	7.144 (0.456)
Rural food product per capita	0.307 (0.273)
Yields	30.283 (17.982)
Food Shock	0.261 (0.439)
Flood	0.118 (0.323)
Drought	0.113 (0.317)
Average monthly rainfall	335.826 (256.696)
Share of Health Expenditure in State income	0.012 (0.005)
Share of Development Expenditure in State income	0.109 (0.041)
Share of Education Expenditure in State income	0.035 (0.012)
Banks per capita	0.057 (0.027)
Urban Population Share	0.234 (0.083)
Prop of Seats won by State Parties	0.114 (0.232)
Prop of Seats won by Congress	0.418 (0.259)
Prop of Seats won by Hard Left	0.085 (0.15)
Prop of Seats won by Soft Left	0.02 (0.049)
Observations	603

Notes: Standard deviations are in parentheses. Suicide rates are defined per 1000 individuals in a given state and year. Yields are total agricultural output per area sown. Food shock is equal to one if a food shortage occurred in a given state and year, and zero otherwise. Similar dummy variables are defined for the occurrence of a flood or drought.

Table A2 - Summary Statistics - Individual Level Data (NFHS)

Variable	Mean (s.d.)
Beaten by husband	0.28 (0.45)
Wife - Age	29.16 (9.49)
Wife - No education	0.32 (0.47)
Wife - Housewife	0.60 (0.49)
Wife - Year of marriage	1990 (8.66)
Wife - Exposed to Amendment	0.17 (0.38)
Husband - No education	0.22 (0.42)
Husband - Cultivator	0.25 (0.44)
Hindu	0.72 (0.45)
SC	0.17 (0.38)
ST	0.14 (0.34)
OBC	0.33 (0.47)
Rural	0.54 (0.50)
Number of Durables Owned	2.71 (1.76)
Observations	61938

Notes: Standard deviations are in parentheses. SC, ST, and OBC refere to the caste groupings (Scheduled Caste, Scheduled Tribe, and Other Backward Castes). The excluded category are the higher ranked castes in the Indian social hierarchy.

8.4 Other Estimations

Table A3 - Suicide Rates with Years of Amendment- OLS Estimations

Variable	Female	Male	Female-Male	Female/Male
Years Amendment	0.002 (0.0004)***	0.007 (0.001)***	-0.005 (0.0009)***	-0.009 (0.003)***
Cultural Controls	YES	YES	YES	YES
Economic Controls	YES	YES	YES	YES
Linear time trend	YES	YES	YES	YES
Observations	531	531	531	531

Notes: All regressions have state and year controls. Standard errors are clustered at the state level. A single asterix denotes significance at the 10% level, double for 5%, and triple for 1%.

Table A4 - Suicide Rates and Female Inheritance- Robustness Tests

Variable	Female	Male	Female-Male	Female/Male
Excluding Kerela:				
Amendment	0.01 (0.005)**	0.04 (0.01)***	-0.03 (0.01)***	-0.15 (0.04)***
Observations	490	490	490	490
Excluding Bihar, Punjab, U.P.:				
Amendment	0.009 (0.004)**	0.03 (0.01)***	-0.02 (0.009)***	-0.08 (0.04)**
Observations	422	422	422	422

Notes: All regressions have state and year controls as well as the economic and cultural controls of the previous tables. Standard errors are clustered at the state level.. A single asterix denotes significance at the 10% level, double for 5%, and triple for 1%.