

GENDER EQUITY, LEGAL REFORM AND LOCAL INSTITUTIONS:
THE POLITICAL ECONOMY OF GENDER-EQUALIZING LAND
INHERITANCE REFORM IN RURAL INDIA

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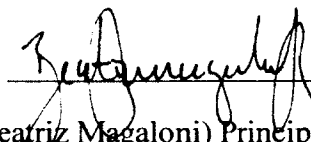


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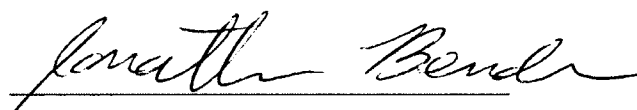
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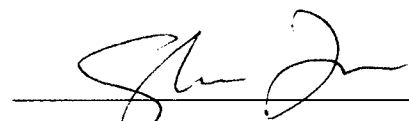
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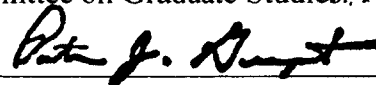
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Table of Contents

Acknowledgements	iv
Table of Contents	vi
List of Tables	vii
List of Illustrations	ix
Introduction	1
Paper I: Gender Equity and Inheritance Reform: Evidence from Rural India	7
Paper II: The Silence about Sex Ratios: Unintended Consequences of India's Gender-Equalizing Land Inheritance Reform	41
Paper III: Accounting for Accountability: Local Governance & Gender Equality in Rural India	83
Appendices: Paper I.	100
Appendices: Paper II.	112
Appendices: Paper III.	126
Bibliography	140

List of Tables

Paper I.

Table 1: Reform's Impact on Equality of Daughter's Land Inheritance Share, All States	100
Table 2: Reform's Impact on Equality of Daughters' Land Inheritance Share, for Comparison Groups at the Border of Andhra Pradesh, Karnataka & Tamil Nadu	101
Table 3. Reform's Impact on Equality of Daughters' Household Land Inheritance Share, Conditional on Reservations for Women Local Official	102
Table 4. Reform's Impact on Equality of Daughters' Household Land Inheritance Share, Conditional on Local Official's Accountability to Women	103
Table 5. Reform's Impact on the Equality of Daughters' Inheritance Share, Conditional on Local Official's Accountability to the (Male) Household Head	104

Paper II.

Table 1. Reform's Impact on the Sex Ratio (Daughters: Sons), Tri-state Border Comparison Group	112
Table 2: Reform's impact on the Sex Ratio (Daughters:Sons), All states	113
Table 3. Reform's Impact on the Sex Ratio, Treatment based on Grandfather's Death, Tri-state Border Comparison Group	114
Table 4. Reform's Indirect Impact, Sons' Care for Elder Parents, Tri-State Border Comparison Group	115
Table 5. Reform's Indirect Impact, Sons' Care for Elder Parents, All States	116
Table 6. Reform's Indirect Impact, Daughters' Relative Survival Rate, Tri-State Border Comparison Group	117

Table 7. Reform's Indirect Impact, Daughters' Relative Survival Rate, All States	118
---	-----

Table 8. Reform's Impact on Daughters' Monetary Dowry (Rs), Tri-State Border Comparison Group	119
--	-----

Paper III.

Table 1. Variation in Officials' Accountability to All Individuals, Individual Characteristics	136
---	-----

Table 2. Variation in Officials' Accountability to Women, Individual Characteristics	137
---	-----

Table 3. Variation in Accountability to All Individuals	138
---	-----

Table 4. Variation in Officials' Accountability to Women	139
--	-----

List of Illustrations

Paper I.

Figure 1. Regional Map of Border Districts at Tri-state Intersection	105
Figure 2. District Map of Border Districts at Tri-state Intersection	106
Figure 3. Qualitative Interview Districts, Andhra Pradesh State	107
Figure 4. Descriptive Statistics: Women at the Tri-state Border, REDS 2006/08	108
Figure 5. Reform's Marginal Impact, Conditional on Local Official's Level of Accountability to Women	109
Figure 6. Descriptive Statistics: Females at the Tri-state Border, IHDS 2005 and REDS 2006/08	110
Figure 7. Reform's Marginal Impact, Conditional on Local Official's Level of Accountability to Men	111

Paper II.

Figure 1. District Map of Border Districts at Tri-state Intersection	120
Figure 2. Qualitative Interview Districts: Andhra Pradesh State	121
Figure 3. Descriptive Statistics: Females at the Tri-state Border, REDS 2006/08	122
Figure 4. Females at the Tri-State Border, Organized by Father's Death Pre- vs. Post-Reform	123
Figure 5. Descriptive Statistics: All Females, REDS 2006/08	124
Figure 6. Descriptive Statistics: Females at the Tri-State Border, IHDS 2005 vs. REDS 2006/08	125

Paper III.

Figure 1. Geospatial Trends in Local Officials' General Accountability, Village-level Averages	126
Figure 2. Geospatial Trends in Local Officials' Accountability, With Respect to Women's Priorities; Village-level Averages	127
Figure 3. Map of Colonial Provinces, British India, 1937	128
Figure 4. Variation in Colonial Land Tenure Systems	129
Figure 5. Histogram: Perceptions of Local Officials' Accountability with Respect to Women's Priorities	130
Figure 6. Geospatial Trends in Local Officials' Accountability to Women	130
Figure 7. Simulations: Local Officials' General Accountability, Variation by Education and Sex	131
Figure 8. Simulations: Local Officials' Accountability with Respect to Women's Priorities, Variation by Education and Sex	133
Figure 9. Simulations: Local Officials' Accountability with Respect to Women's Priorities, Variation by Women's Migration	134
Figure 10. Simulations: Local Officials' Accountability Conditional on Varied Experience with Reservations	135

Introduction

Women's centrality to socio-economic and political development is a matter of widespread consensus. Economic empowerment of women improves child health, particularly for daughters; it creates household-wide benefits due to higher investment in housing, nutrition and health; and it is a lever for women's political empowerment.¹ Women's political empowerment, in turn, is found to broaden the scope of public goods provision, reduce corruption levels and improve women's capacity to access resources, information, and respect in villages.² In light of this consensus, contemporary gender inequalities are stark in the developing world, where approximately 4 million women are "missing" due to female infanticide, gender biases in access to health care, and neglect.³

Given the importance of gender equity for development, how can we alter persistent inequalities? The dissertation focuses on one dimension of this question: Can law and institutional changes alter fundamental, deep-rooted gender inequalities? In particular, this dissertation seeks to understand institutional and legal changes' impact in one of the most extreme sites of gender inequality: India. The country is one of the two largest contributors to the world's "missing women"; women's Parliamentary representation (10.86 percent) is extremely low both by global and regional standards; and it is rated the worst place to be a woman of all G20 countries.⁴

Studies demonstrate legal reform's ability to alter gender equity. Most importantly, laws can alter women's intra-household bargaining power via increasing the stock of

¹ Braun and Kvasnicka 2009; Duflo 2003; Duflo and Udry 2004; Thomas 1990, 1993.

² Aidt and Dallal 2011; Buch 2000; Chattopadhyay and Duflo 2004; Dollar, Fisman, and Gatti 2001; Duflo 2003, 2012; Duflo and Topalova 2004; Lindberg et al. 2011; Miller 2008; UN 2005; World Bank 2011. Of course, gender equity also has an inherent value as a source of the basic freedoms constitutive of development, as Amartya Sen (1999) outlines in *Development as Freedom*.

³ Amartya Sen popularized the notion of "missing women" in his 1990 *New York Review of Books* article titled "More Than 100 Million Women Are Missing". Esther Duflo (2012: 1051) cites the World Bank's 2011 World Development Report on *Gender Equity and Development* (see Table 1, pg.15).

⁴ Sen 1990; Rai 2011: 50; <http://www.trust.org/trustlaw/news/special-coverage/g20women/>.

capital they contribute to marriage or expanding women's options to exit marriage.⁵ Evidence links legal reforms to improved gender equity in educational attainment and labor force participation, as well as to drops in domestic violence. Institutional reforms which increase women's political representation improve gender equity by raising women's aspirations, expanding provision of women's public goods priorities, and increasing women's voice in the criminal justice system.⁶ Yet, the econometric literature on gender suffers from an important weakness: apart from a few exceptions, it assumes that a key independent variable – legal enforcement or institutional quality – is consistent across space and time.⁷ A great deal of qualitative literature challenges this highly-questionable assumption, particularly with respect to the varied hurdles in enforcing women's rights.⁸

This dissertation advances the literature on institutions, gender equality, and development by identifying the importance of local political institutions' enforcement capacity as a key predictor of gender-equalizing legal reform's varied impact. This project follows the spirit of Aldashev, Chaara, Platteau, and Wahhaj (2012) in identifying conditions under which legal reform can alter deeply-rooted customs. Yet it explains the impact of formal, rather than informal, authorities' varied enforcement of custom-defying law on gender equality. The dissertation utilizes a micro-level approach to determine the fine-grained, individual- and local-level sources of variation in enforcement capacity, controlling for the influence of culture and the historical trajectory of national political and economic institutions, in light of work by Ellickson (1991), Jha (2010), Kuran (2004), Greif (2006), and Williamson (1983), among others.

The dissertation consists of three papers. The first paper identifies legal reform's heterogeneous ability to alter a key dimension of gender equality: women's land inheritance. Land inheritance is significant because it is the main vehicle for gaining

⁵ Agarwal 1994; Braunstein and Folbre 2001; Cheung 1972; Chiappori, Fortin, and Lacroix 2002; Deere and Doss 2006; Duflo 2012; Fafchamps and Quisumbing 2007; Field 2007; Folbre 1994; Kirdar, Dayioglu Tayfur, and Koç 2010; Roy 2012; Stevenson 2007; Stevenson and Wolfers 2006; World Bank 2011.

⁶ Beaman, Duflo, Pande, and Topalova 2012; Chattopadhyay and Duflo 2004; Iyer, Mani, Mishra, and Topalova 2012; Pande and Ford 2011.

⁷ Iyer et al. (2012) present an exceptional piece of econometric work.

⁸ An excellent example is Nitya Rao (2008) *Good Women Do Not Inherit Land*.

land rights in contemporary rural India, where land is the most essential source of economic income as well as “entitlements” to security and political influence.⁹ In fact, land inheritance has been a crucial source of leverage in historic women’s suffrage movements including those in the US and UK.¹⁰ More generally, property represents the most promising avenue for women’s financial autonomy in primarily agrarian economies across the developing world.¹¹

The first paper finds that legal reform has a limited independent impact on improving gender equity in the distribution of land inheritance. However, the paper also shows that legal reform yields tangible results under two conditions: (1) the presence of exogenously-determined “reservations” for elected female *Pradhans* (village heads),¹² and (2) perceptions of local officials’ accountability to women’s priorities. Reservations and accountability are closely linked: evidence suggests that reservations alter local officials’ responsiveness to women’s priorities, with significant positive benefits for legal reform’s ability to improve women’s access to land. In my third paper I explore the reasons for variation in these perceptions of accountability.

The second paper examines the extent to which gender-equalizing reform of land inheritance rights has succeeded in increasing the value families place on daughters in rural India. In the context of growth both in reported violence against women and in informal support for practices that have been outlawed in order to equalize women’s status – most notably dowry – gender-equalizing reform of land inheritance law may give women a powerful resource with which to combat social vulnerability.¹³

⁹ Agarwal 1994; Rao 2008; Roy and Tisdell 2002; Sen 1981.

¹⁰ Notably, Elizabeth Cady Stanton, who drafted the declaration of women’s rights that guided the woman’s suffrage movement in the US and provided the model for the British movement gained her autonomy as an activist thanks to her sizable land inheritance from her father (Folbre 2009).

¹¹ The second avenue, income earned outside the household, is also linked to independent land rights. See Engels 1884; Anderson and Eswaran 2009.

¹² I refer to the 72nd and 73rd constitutional amendments, passed in 1992, which directed India’s state governments to conduct elections at local levels, devolved expenditure and oversight powers to these elected bodies, and mandated the reservation of one-third of seats in these bodies for women. See Bhavnani 2009; Chattopadhyay and Duflo 2004.

¹³ On dowry trends, see Anderson (2003). On violence against women, see Pidd (2012), who explains that India’s National Crime Records Bureau reports a 7.1 percent increase in recorded crimes against women between 2010- 2011 (when 228,650 incidents occurred), with the greatest increase in cases under the Dowry Prohibition Act (up by 27.7%), followed by kidnapping and abduction (increasing by 19.4% each year) and rape (rising by 9.2%). Amongst women with titles to land, there is evidence

According to theories of “bargaining in the shadow of the law”, inheritance reform may change bargaining power by altering individual entitlements.¹⁴ If so, India’s gender-equalizing land inheritance reform may increase daughters’ value via increasing their bargaining power. Alternately, given scarce resources and patriarchal institutions such that parents transfer land inheritance exclusively to sons as an investment in their old-age security and wealth, gender-equalizing inheritance reform may threaten parents’ long-term security by altering their ability to invest in specific children – sons – who can credibly commit to care for them in the future. In this case, inheritance reform may create perverse incentives for parents to alter inheritance investments outside the law by reducing the number of daughters born in order to maximize inheritance-based investments in sons.

This second paper finds evidence of a decline in women’s reported child sex ratio (daughters-to sons) in villages and even within households where women are eligible vs. ineligible for gender-equal land inheritance. A second set of results uncover the causal mechanism for declining sex ratios: where daughters are treated by reform, sons are indeed less likely to care for elder parents, relative to families where daughters’ inheritance is unaffected by gender-equalizing land inheritance reform. These findings highlight the dangers of attempting gender-equalizing reform in the face of India’s contradictory social norms, absent engagement with the household-level political economy of gender-specific investments that undergirds norms.

The third paper, for which preliminary analysis is presented, explores the roots of local officials’ accountability to women.¹⁵ Existing literature emphasizes accountability as

that rates of domestic violence are significantly lower and support for daughters’ education is higher than average (Goyal, Deininger, and Nagarajan 2012; Panda and Agarwal 2005; Roy 2012).

¹⁴ Aldashev et al. 2012; Cooter, Marks, and Mnookin 1982; Hart and Sacks 1958; Iversen and Rosenbluth 2005; Lundberg and Pollak 1993; Mnookin and Kornhauser 1979; Posner 2000; Sen 1981; Stevenson and Wolfers 2006.

¹⁵ The first measure of local officials’ accountability is based on NCAER’s 2006/8 REDS question: “How easy is it for you to hold local officials accountable for the functions they are supposed to be performing?” Responses are based on a discrete scale that ranges from 1 (“impossible”) to 5 (“no problem at all”). The second measure of local officials’ accountability is individuals’ response to the following, hypothetical question: “Meenakshi, the four-year-old daughter of Rajesh fell ill after eating the food provided by the noon meal programme. When Lakshmi, the wife of Rajesh went to complain to the school, she was rebuked and asked to talk to the Pradhan (Panchayat President). She has since asked Rajesh to talk to the Pradhan.” [SURVEYOR THEN ASKS:] “How easy is it for Lakshmi to hold

a key explanatory variable predicting the scope and quality of public goods distribution.¹⁶ In part because of the established relationship between accountability and public goods provision, measures of accountability are frequently used as proxies for the quality of governance.¹⁷ This dissertation's analysis of accountability advances the literature on two fronts: first, it analyzes a crucial dimension of accountability: enforcement. Specifically, enforcement is measured as a function of citizens' perceived ability to demand realization of their legal rights from local officials. Second, it investigates micro-level variation in accountability levels within India. This paper presents a more nuanced test of the relationship between the quality of democratic political institutions, accountability, and gender equity than prior work.¹⁸ Although India's ancient history of democracy in the form of *panchayats* or local collectives is widely-acknowledged,¹⁹ India also has some of the most extreme gender disparities in the world.²⁰ Yet, this categorization masks great, unexplained variation in gender equity and democratic institutions across India.²¹

This paper analyzes variation in perceptions of accountability at three levels. At the individual level, respondents perceive local officials' accountability as highly responsive to a given individual's socio-economic status, particularly with respect to gender and education. At the village level, two results are particularly striking: first, the exogenously-determined implementation of reservations for female *Pradhans* is consistently a statistically-significant predictor of improved perceptions of local

the local officials accountable for performing their functions?" As in the first measure of accountability, evaluations range between 1 ("impossible") and 5 ("not a problem at all").

¹⁶ Alesina, Baqir, and Easterly 1999; Banerjee and Somanthan 2007; Bates 1981; Diaz-Cayeros, Estévez, and Magaloni 2012; Posner 2005; Tsai 2007.

¹⁷ Kholi 2001; additionally, a growing body of work documents the role of public information as a source of higher accountability and improved public goods provision. On this, see: Besley and Burgess 2002; Besley and Prat 2001; Ferraz and Finan 2008; Khemani and Keefer 2011; and an excellent summary of the literature by Diaz-Cayeros, Estévez, and Magaloni 2012.

¹⁸ On the relationship between democracy and accountability, see: Baum and Lake 2003; Besley and Kudamatsu 2006; Chhibber and Nooruddin 2004; Foster and Rosenzweig 2004; Olken 2010; Stasavage, 2005. On democracy and gender equity, see: Alexander and Welzel (Unpublished. Accessible on-line at: <http://www.democracy.uci.edu/files/democracy/docs/conferences/grad/alexander.pdf>); Beer 2009; Inglehart & Norris 2003; Inglehart & Welzel 2005; McDonagh 2002; Welzel 2003.

¹⁹ Roy 2010.

²⁰ The 2011 Human Development Report's Gender Inequality Index ranks India as 129 out of 146 countries, behind all other South Asian states except Afghanistan.

²¹ Dreze and Sen (2002).

officials' accountability to all constituents. Reservations are also a statistically significant predictor of local officials' improved accountability with respect to *women's priorities*. Second, village-level competition for the elected post of *Pradhan* is a consistent, statistically-significant predictor of local officials' accountability. Taken together, these results suggest that perceptions of local officials' accountability may vary significantly as a result of dynamic local political competition and institutions (reservations). Finally, at the state level, this analysis presents a far more heterogeneous evaluation of local officials' accountability than aggregate, state-level statistics on the quality of local governance and corruption suggest (Bussell 2012).

Overall, this dissertation advances our understanding of legal and broader institutional reforms' impact on gender equality, as a crucial component of economic and political development. The three papers present a micro-level empirical study of reform's heterogeneous impact on individual behavior, resources, and political institutions. The dissertation captures a critical dimension of legal reform's ability to alter deeply-rooted conventions by explaining an as-yet unexplored dimension of formal institution's influence on gender equality: local political actors and institutions – who determine what legal enforcement actually means in individuals' daily lives.

The future agenda for this research is to expand the set of three papers into a book project. Additional chapters of the book will relate to the following four points: first, an historical chapter on the evolution of inheritance reform as a function of women's influence as voters. Second, building a narrative structure from ethnographic field research on individuals' decisions to demand inheritance rights rather than accepting traditional norms. Such decisions are primarily the result of either highly-accountable village-level officials or participation in Self Help Groups. Third, development of a formal model of intra-household bargaining grounded in field research with implications for varied power and conflict based upon land inheritance rights. Fourth, a combination of field research and 40 years of land inheritance disputes in Krishna district, Andhra Pradesh will provide the framework for tests of the formal model as well as a detailed explanation of the deeply-rooted socio-economic constraints to the process of women's empowerment.

Gender Equity and Inheritance Reform: Evidence from Rural India

Abstract

Do reforms equalizing women's land inheritance rights improve gender equity in rural India? By exploiting temporal variation in legal implementation, I find no evidence that "gender blind" land inheritance laws increased amounts of land inherited by eligible women. I argue that reform failed for two reasons: first, gender-equalizing legislative changes failed to take into account the full cost-benefit calculation of rural Indian women who would rather forgo their legal rights than relinquish access to a familial "safety net". Second, local officials remained more responsive to male household heads who sought to subvert reform than rural women who stood to benefit from the reforms. Additional regression analysis highlights reform's heterogeneous impact at the local level. Reform increases land inheritance inequality when political institutions permit a "Coasean solution" to institutional reform: re-engineering enforcement to bolster traditional institutions. In contrast, exogenously-determined "reservations" for female elected heads of local government increase local officials' responsiveness to women, with significant positive benefits on inheritance reform's ability to improve gender equity. In sum, legal reform that contradicts deeply-rooted social institutions requires enforcement in a complex socio-political landscape. Gender-equalizing legal reform may succeed in changing behavior where instruments exist to address both the problem of inegalitarian institutions and legal enforcement.

Introduction

Does gender-equalizing reform of land inheritance rights improve gender equity in rural India? Is reform, alternatively, a tool for organizing resistance against gender equity? The answer, this paper argues, is conditional on local incentives for legal enforcement. The identity of the citizens to whom local officials are accountable can shift local officials' incentives to enforce versus undermine legal reform. Where randomly-assigned "reservations" for female heads of local electoral councils exist, officials are perceived as highly accountable to women and reform significantly improves the gender equity of land distribution. In contrast, where local officials are perceived as highly accountable to men, reform has a significant negative impact on gender equity with respect to land distribution. In sum, legal reform that contradicts deeply-rooted social institutions requires innovative enforcement mechanisms to prevent status quo stakeholders' from contravening gender-equalizing reform.

Two contrasting cases from rural India illustrate how the village head's identity can shift local officials' incentives to enforce versus undermine legal reform. First, take the case of the female village leader "Rajkumari" in the state of Andhra Pradesh. With four years of education, Rajkumari is relatively well-educated amongst her female peers but she is not an extraordinary outlier. The rest of her profile is also typical of the group of women empowered via reservations: she comes from the dominant scheduled caste – formerly connoting village watchmen – and the small village in which she lives – located in the hills of north-eastern Andhra Pradesh – is far from a major road. Rajkumari explains that she was elected president of the local council in a seat reserved for women because: "All women believe [that] I am the right person to get [work] done".²² One of the many projects that her constituents list as completed due to her initiative is the granting of land rights for thirty people via a public

²² Author's interview on 13 November, 2010, Visakhapatnam District, Andhra Pradesh: Respondent IV.1.

program.²³ What is striking is women's strong presence throughout the decision-making process about the distribution and use of land. Not only were women present during state officials' initial surveying of village land, they also filed claims in local revenue offices to demand titles to state-distributed land, and when they speak of the benefits accruing from their land ownership (both inherited and acquired), they talk of improved respect and affection within their households, "rights", "courage", and "invulnerability".²⁴

The situation is completely reversed in a second village in the same district where officials are perceived as highly accountable to men. Also located in the hills with the majority of adult women receiving little to no education, it is at the edge of a major road and at the periphery of a regional tourist hub. The village's elected head is male, and all women interviewed agree that officials are responsible directly to men since the "male decision is final".²⁵ When asked about the process of obtaining land, women do not consider any role for themselves: "Usually [families] don't write, because father-in-law's land is transferred to husbands' names only, so we won't have any land."²⁶ Although women believe they have equal rights to land inheritance according to the state, and all have identity cards that they have used to gain one hundred days of work paid by the state, no one knows how to use the state to realize legal land rights. In one woman's words: "I listened to that word 'law' – I hear government is doing this 'as per law' on TV but I don't know what it means".²⁷ In contrast to the first village where women have collaborated with a female elected official to solidify land rights, in this village women emphasize the negative consequences of female land inheritance:

²³ The Comprehensive Land Development Program, A.K.A. Indira Prabha, launched via Andhra Pradesh's Chief Minister as of November 19, 2004. For details, see: <http://anantapur.gov.in/images/inner/dwma-gallery/cldp.pdf>.

²⁴ Author's interview on 13 November, 2010, Visakhapatnam District, Andhra Pradesh: Respondents I.10, IV.1, and I.12, respectively.

²⁵ Author's interview on 14 November, 2010, Visakhapatnam District, Andhra Pradesh: Respondents 1-14.

²⁶ Ibid: Respondent 11.

²⁷ Ibid.

“[families] will quarrel, they won’t cultivate the land peacefully, so it will be bad... we will not give like that”.²⁸

The two cases show that gender-equalizing legal reform may succeed in changing behavior where instruments exist to address both the problem of inegalitarian social institutions and legal enforcement. However, reform may instead increase inequality when political institutions permit a “Coasean solution” to institutional reform: re-engineering legal enforcement to bolster traditional institutions.

Literature

Across south Asia, over 70 percent of the population is dependent on agriculture and the rural economy.²⁹ As access to land becomes increasingly scarce, gender inequality in who owns vs. cultivates land is rising. In India, this gap is particularly wide: 85 percent of women are agricultural workers, compared to 71 percent of men, yet women own only 10 percent of land.³⁰ Land ownership is significant not only as a source of economic income but also of ‘entitlements’ to security and power in both social and political realms.³¹

An influential conventional wisdom states that legal reform itself can be a powerful tool to change social conventions by shifting the costs and benefits of action.³² In this case, land inheritance reform may improve daughters’ land inheritance by increasing the costs of supporting traditional, gender-inegalitarian norms, while increasing the benefits of egalitarian inheritance distribution.³³ If the conventional wisdom is correct, gender-equalizing land inheritance reform’s impact should be homogeneous and positive.

²⁸ Author’s interview on 14 November, 2010, Visakhapatnam District, Andhra Pradesh: Respondent 13.

²⁹ Rao 2005, 4701.

³⁰ Government of India 2000; Rao 2011.

³¹ Agarwal 1994; Rao 2008; Roy and Tisdell 2002; Sen 1981.

³² Aldashev et al. 2012; Mackie 1996; Posner 2000; Schelling 1960.

³³ Agarwal 1994; Ambrus, Field, and Torero 2010; Fafchamps and Quisumbing 2008; Field 2007; Goyal, Deininger, and Nagarajan 2012; Panda and Agarwal 2005; Qian 2008; Roy and Tisdell 2002; Roy 2012; Udry 1996.

In contrast, another literature highlights the role of formal institutions in determining the state's ability to implement policy, in particular where policy runs counter to informal institutions (social norms).³⁴ According to this literature, the political economy of support for informal vs. formal institutions determines reform's impact.³⁵ Theories of institutions suggest reform's impact should be heterogeneous. This variation should be due, at least in part to formal institutions' ability to alter support for the informal institutions which dictate gender-inegalitarian, patrilineal inheritance practices. I develop and test a theory of varied legal impact due to variation in local officials' incentives to enforce formal vs. informal institutions. This theory is based on observational evidence of variation in gender-equalizing land inheritance reform's impact, which emerged across 692 focus group interviews.

How can we assess the impact of gender-equalizing inheritance reform? I use a difference-in-differences research design to assess the impact of laws aimed at equalizing women's rights to inherit land. Gender-equalizing inheritance reforms were passed in different years in different states; I exploit this temporal variation in addition to comparisons of individuals across state borders to construct a plausible counterfactual.³⁶ Using panel survey data for 8,569 households collected by the National Council of Applied Economic Research's Rural Economic and Demographic Survey (REDS), this paper leverages the geography of state boundaries to identify individuals from geographically- and culturally-similar districts where reform's year

³⁴ Acemoglu et al. 2002; Aldashev et al. 2012; Coase 1937; de Lara et al. 2008; Ellickson 1991; Helmke and Levitsky 2004; Iyer 2012; North and Weingast 1989; Platteau 1999, 2011; Posner 2000; Williamson 1985.

³⁵ Ambrus et al. 2010; Blaydes and Linzer 2008; Dunning and Nilekhani 2013; Margetts et al. 2010. On the potential for backlash to reform by status-quo stakeholders, see: Abirafeh 2009; Anderson 2003; Goodhart 1975; Harriss 1979; Kay 2011; Klarman 1994; Kranton and Swamy 1999; Mackie 1996; Mayaram 2002; Platteau and Peccoud 2011; Quisumbing 2004; Rao 2005, 2008; Rosenblum 2011; Scott 1998; World Bank 2012.

³⁶ Between 1976 and 1994, four states equalized Hindu daughters' rights to inherit their parents' ancestral land. 'Treatment' by reform is conditional on two major factors: marriage after reform's implementation and the death of one's father post-implementation. In an ideal comparison, daughters would be randomly-assigned to treatment and control groups, such that their only significant difference is their inheritance rights (equal or unequal). In reality, legal reform created a quasi-random "natural experiment". Although the first criterion - the timing of father's death - is arguably uncorrelated with individual characteristics; the second criterion - the date of one's marriage - is potentially open to manipulation by individuals, either to evade or benefit from reform.

of implementation varies due to individuals' location on a given side of state boundaries (see Figure 1).

[Figure 1 about here.]

People in border districts of south India's linguistically-determined states share not only a common geography, climate, languages, and social traditions, but also have common experiences of history, having been a part of common administrative entities for more than two centuries (Ban, Jha, and Rao 2012). I analyze individuals in eleven districts at the tri-state border. I exploit reform's differential timing in the three neighboring states with a common border, pictured in Figure 1.³⁷

In order to isolate the role of formal institutions in determining the impact of gender-equalizing reform, I focus on one dimension of formal institutions which may influence legal enforcement: the pre-eminent elected local official, the *Pradhan* (village chief)'s responsiveness to women's demands for public services. Intuitively, we would expect officials' enforcement to vary in rigor depending on their perception of the law's salience and enforcement's cost.³⁸ Where the preeminent elected official is responsive to women's demands, the salience of gender-equalizing land inheritance reform should be higher and the cost of enforcing reform should drop thanks to the inclusion of daughters' voices in determining and evaluating the scope of legal enforcement. Such action should create a virtuous cycle for legal enforcement: where

³⁷ NT Rama Rao's Telugu Desam Party initially implemented the Hindu Succession Act Amendment in Andhra Pradesh as of 1986, followed in 1989 by the Dravida Munnetra Kazhagam under Muthuvel Karunanidhi in Tamil Nadu, and subsequently, in 1994, by the Indian National Congress led by M. Veerappa Moily in Karnataka and led by Sharad Pawar in Maharashtra. In addition to geographic comparison groups, I create comparison groups by exploiting variation within families that have treated and untreated daughters and live in the four south Indian states to implement reforms at varied times (the three states above and Maharashtra, located north of Karnataka and Andhra Pradesh). In multi-daughter families where fathers pass away after reform, variation in daughters' 'treatment' status is based on whether daughters marry before or after inheritance reform. Comparisons of daughters within the same family allow for measurement of legal impact while controlling for a range of opportunities and values transmitted from parents to children in the family. Most importantly, parents' attitudes towards women's empowerment and legal compliance are unlikely to change as they consider different daughters. Within-family comparisons are essentially a test of inheritance reform's ability to alter families' attitudes toward gender equality in two ways: directly, via ancestral land transfers, and indirectly via daughters' willingness to bear daughters vs. sons. Findings confirm the general trends from inter-household analysis, and are available upon request.

³⁸ A forthcoming paper will examine which socio-political factors explain village-level gender-bias in officials' accountability.

local elected officials are more responsive to women, households should increasingly make decisions with the *ex-ante* assumption that gender-equalizing law will be enforced, thus creating more gender-equal distribution of ancestral land and reducing the cost of legal enforcement for local officials. In contrast, if legal reform is the dominant driver of change, there should be a net positive impact of reform on eligible daughters.

In contrast to the conventional wisdom, I find that there is little to no sign of any *net positive impact* of the law on amounts of land inherited by eligible women. In line with institutional theories, I find that exogenously-determined institutional changes that increase women's representation in local government also increase local officials' responsiveness to women, with significant positive benefits on inheritance reform's ability to improve gender equity.

I utilize qualitative evidence based on nearly two years of field research to build a theory of heterogeneous legal impact based on variation in accountability-based incentives for legal enforcement. Qualitative analysis of the mechanisms behind reform's heterogeneous impact is based on interviews women, their husbands, local officials and lawyers in the south Indian state of Andhra Pradesh. Interviews occurred in districts selected to represent the state's diverse geography, culture and economy across Coastal Andhra, Telangana and Ryalaseema regions.³⁹

[Figure 3 about here.]

This paper fills a gap in existing theories of the political economy of gender and land rights reform. Prior work has identified the informal power of political networks in realizing land rights, but has yet to capture formal local political institutions' influence on gender-equalizing land inheritance reform.⁴⁰ This paper's results suggest that resistance to gender equity in land inheritance is highly political and highlight the importance of local political institutions in legal implementation. In particular, this

³⁹ Districts include isolated, hilly Srikakulam and Visakhapatnam districts in the Northern Coastal Andhra region; highly-connected and well-irrigated Krishna district in Central Coastal Andhra; the water-scarce Telangana region's Naxal-affected Khammam district as well as the urban-fringe Ranga Reddy district; and water-scarce, politically-energetic Anantapur district in Ryalaseema.

⁴⁰ Dunning and Nilekani 2009; Goldstein and Udry 2008; Luke and Munshi 2011; Pande and Udry 2005.

paper demonstrates that legislative reform's ability to create gender-equal land inheritance is conditional on local incentives for legal enforcement, based upon *the identity of the citizens to whom* local officials are accountable. Put differently, legal implementation is a political rather than a mechanical process: changing the letter of the law is meaningless without understanding the political dynamics of legal enforcement at the local level. I interpret these findings to emphasize the importance of engaging both political institutions and the stake-holders who support existing social norms as a prerequisite for effective gender-equalizing legal reform.

Assessing Reform's Impact

An influential body of scholarship on law and society claims that the law can be a powerful tool for altering social conventions via its ability to make the costs of non-compliance with progressive law greater than the net benefit of support for social norms.⁴¹ If so, Indian states' reforms equalizing daughters' right to inherit their parents' ancestral land on par with sons' – via amendments of India's Hindu Succession Act of 1956 – should roughly equalize daughters' inheritance shares. These amendments, hereafter collectively referred to as either the HSAA or 'reform', equalized daughters' right *upon birth* to inherit a share of joint family property.⁴² The HSAA's reform of inheritance is significant because the majority of land in rural India remains jointly owned, and because pre-reform, sons were the only children entitled *by birth* to inherit independent shares in jointly owned land.⁴³

Prior analysis of reform's impact supports the conventional wisdom, finding a significant, positive impact of the HSAA on daughters' inheritance (Goyal, Deininger, and Nagarajan 2012). In contrast to the contemporary consensus, I find that there is little-to-no sign of any positive impact of reform on the equity of land shares inherited by eligible women (Table 1). This finding runs counter to prior work by Goyal et al.

⁴¹ Aldashev et al. 2012; Mackie 1996; Posner 2000; Schelling 1960.

⁴² For the legal text and precedents, see Desai 2010. For additional interpretation, see Agarwal 1994 and Roy 2012. Amendments were passed by Andhra Pradesh (1986), Tamil Nadu (1989), and Karnataka and Maharashtra (1994).

⁴³ Roy and Tisdell 2002; Roy 2012.

(2012), due to three important improvements in estimating reform's impact. First, I employ a dependent variable which allows a precise test of reform's ability to alter *gender equality* of inheritance shares, rather than using rough indicators of equality such as changes in daughters' net probability of inheriting land. Second, I use measures of legal eligibility that conform to the letter of the law, which includes conditions not acknowledged in prior work. Third, I create comparison groups that construct relatively more plausible counterfactuals of daughters' inheritance absent reform.

[Table 1 about here.]

The paper proceeds by outlining the relevant data, quantitative strategies of assessing reform's direct impact, and findings. Its next section develops a theory of heterogeneous legal impact based on variation in accountability-based incentives for legal enforcement. The paper uses observational evidence from nearly two years of field research for bottom-up theory development. The final two sections test the theory's hypotheses about reform's heterogeneous effects on daughters' land inheritance, conditional on the nature of local political officials' accountability to women. Using both qualitative and empirical analysis, this paper is able to confirm and explain findings by an emerging body of work that hints at inheritance reform's highly varied ability to move daughters' land inheritance shares significantly closer to equality (Roy 2012) and improve women's value in society (Panda and Agarwal 2005; Rosenblum 2013).

Data

Following prior work on the HSAA, my primary data set is drawn from the National Council of Applied Economics (NCAER)'s Rural Economic and Demographic Survey (REDS).⁴⁴ This nationally-representative panel survey covers 8,659 households from 240 villages in 17 states of rural India in its most recent 2006/8 round. In addition to

⁴⁴ Both Goyal et al. (2012) and Roy (2012) analyze data from NCAER's REDS. This paper follows Goyal et al. in using the most recent round of REDS with the most comprehensive questions on women's landholdings, from 2006/8.

the standard set of demographic questions, the survey records all land transfers across three generations: the household head's parents, the head along with his siblings and spouse, and the head's children. A third, relevant segment of the questionnaire individually asks the household head, spouse, and additional adults residing in the household about their political participation and perceptions of local governance.

The dependent variable of interest is the equality of an individual daughter's land inheritance share. This is measured as the difference between the fraction of parental landholdings a given daughter, i , inherits and the fraction of landholdings she would inherit upon equal division of the deceased head's land amongst his inheritors,⁴⁵ within a given natal household h , living in state s , where the natal household head (the father) is born in year t : $\frac{\text{Acres inherited}_{ist}}{\text{Acres inheritable}_{hst}} - \frac{1}{\#\text{inheritors}_{hst}}$. This variable ranges between -1 and 1. The difference between daughters' actual and fair share approaches -1 if daughters inherit nothing but constitute nearly all of inheritors. It approaches 1 if daughters inherit all land and constitute virtually none of the inheritors. Across households in the tri-district border region, the average difference between daughters' actual and fair share is negative 0.18. This means that women inherit 18 percent less of the household's land than they would under a fair distribution of inheritance, in line with reform. If reform increases gender equity, the difference between daughters' actual and fair share should move towards zero (equality).

The independent variable of interest, eligibility for legal reform, is based on the HSAA's conditions. Specifically, state amendments equalized rights to inherit ancestral land for Hindu women (80 percent of India's population)⁴⁶ who meet four conditions: their fathers pass away after the law's implementation, absent a will specifying the distribution of ancestral property and absent partition of the father's ancestral property, and who marry after the law's implementation (Desai 2010). Given

⁴⁵ I calculate the number of persons legally-entitled to inherit the household head's land as the sum of the family's daughters, sons, and the surviving spouse. Technically, inheritance for a jointly-owned property extends across three generations. When dividing a father's inheritance amongst his successors, this would mean that a head's children and his children's children inherit. I simplify this scenario to consider only the first generation of descendants.

⁴⁶ India's personal, or religion-specific law, defines Hindu law as applicable to all individuals of Hindu, Buddhist, Sikh or Jain religions. For the sake of simplicity, I refer to this group of individuals by their legal status, e.g. as collectively "Hindu".

that partition is nearly-always completed by inheritors after a fathers' death and will-writing remains an infrequent practice, there are two key conditions for eligibility: the timing of fathers' death and of daughters' marriage. I measure legal eligibility as a dummy variable, set to one if fathers pass away post reform and marriage occurs post-reform, and zero otherwise. In order to avoid bias induced by culture, wealth, or the experience of a fathers' death, I limit comparisons to the subset of siblings in Hindu, landholding families whose father has passed away prior to survey collection (2006/8).⁴⁷ However, in order to deal with additional sources of bias, I tightly construct comparison groups that create plausible counterfactuals regarding behavior in the absence of reform, as explained below.

A second dataset is drawn from qualitative interviews with rural women, their husbands, lawyers, activists, and local officials within land revenue departments, the judiciary, the police, panchayats, and other, locally-appointed bodies. These interviews were primarily conducted in the south Indian state of Andhra Pradesh, which pioneered inheritance reform. I selected six districts in which to conduct my interviews in order to represent the state's diverse geography, culture and economy. Districts include isolated, hilly Srikakulam and Visakhapatnam districts in the Northern Coastal Andhra region; highly-connected and well-irrigated Krishna district in Central Coastal Andhra; the water-scarce Telangana region's Naxal-affected Khammam district as well as the urban-fringe Ranga Reddy district; and water-scarce but politically-energetic Anantapur district in Ryalaseema region.

Villages were selected to represent varied access to information (high and low education levels) and levels of women's equality (relatively high and low ratios of women-to-men). Village selection was based on census data, such that villages were first stratified according to the criteria explained above, and then randomly selected within each stratum. Interviews occurred in subsets of the randomly selected villages, based on access generously provided by the Society for the Elimination of Rural Poverty (SERP). I also attempted to balance numbers of landless and landed women,

⁴⁷ Additionally, to avoid bias due to national, gender-equalizing inheritance reform in 2005, I limit the sample to siblings whose father passes away prior to 2005.

educated and uneducated women, women from upper and Scheduled Castes, and members vs. non-members of village associations. Altogether, I conducted interviews in 48 villages, including small, focus-group⁴⁸ or individual-level interviews with 692 individuals, and large group interviews with just over 500 individuals.⁴⁹ The following section begins by presenting quantitative strategies of analysis, a theory of variation in legal impact due to variation in accountability-based incentives for legal enforcement, built from observational evidence gathered in the field. The second-to-last section empirically tests this theory. The conclusion discusses the implications of gender-equalizing inheritance reform's heterogeneous impact, conditional on local officials' accountability to women.

Empirical Strategy

The ideal measure of reform would assess the impact of random assignment into treatment groups, with gender-equal inheritance rights, and control groups, with the prior status quo of gender-unequal rights. Random assignment would create two comparable groups whose only significant difference is their legal inheritance rights. In this case, we could definitively isolate the causal impact of 'treatment' by inheritance reform. In reality, inheritance reform created a quasi-random "natural experiment," where women's inheritance rights were determined by a combination of both nearly-random and potentially non-random factors. I assume that eligibility criteria for gender-equal inheritance rights such as the marriage date can be manipulated, whereas the date of fathers' death is indeed random. To account for potential manipulation of partition and marriage dates, I select comparison groups that

⁴⁸ Focus group interviews usually consisted of approximately 8 women, with a mix of closed and open-ended questions to gauge resource distribution and attitudes towards reform.

⁴⁹ Large group interviews range from 35-100 people, and represent the early portions of fieldwork, mainly between 5-16 April, 2010, when I was still working to formulate appropriate coordination and communication strategies in gathering *small* focus groups.

are highly unlikely to be biased by manipulation.⁵⁰ With regard to fathers' potential 'legal' manipulation of daughters' eligibility via writing wills, the paucity of data on this phenomenon make it difficult to measure.⁵¹ As a result, this investigation can be viewed as a hard test for legal impact – any measured effect is unlikely to capture the full magnitude of legal impact.

In order to create comparable groups of women that approximate the balanced sets of individuals that would result from random assignment to treatment and control groups, this paper presents the results of one strategy: utilizing geographic boundaries. Results are similar for a second strategy: comparing variation within families.⁵² Once I have constructed appropriate comparison groups, I use difference in differences OLS regression analysis, comparing the equality of land inheritance amongst daughters with fathers who died before and after reform across groups of women who marry before and after reform. The difference in differences estimate can be interpreted as the causal impact of legal reform, under the assumption that daughters in treatment vs. control groups would arguably be subject to similar constraints determining inheritance distribution absent reform. In regressions, the control group consists of daughters with fathers' deaths and/or marriages prior to reform.⁵³ The descriptive statistics presented in Figures 3-5 suggest this assumption is valid. Standard errors are clustered at the village level, which was the unit at which survey teams operated.

⁵⁰ Partition post-reform may not be random if male inheritors pre-date partitions such that they appear to occur pre-reform. Fraudulent partitions should become increasingly-difficult to enact beyond the first year of reform's implementation. To exclude such manipulation, the smallest window of time in which the paper examines reform's impact is in the five around reform. Marriage post-reform is potentially non-random if reform was expected to be significant and implementation's timing was well-known in advance. If so, parents with daughters of marital age wishing to evade the law could arrange daughters' marriages pre-reform. To avoid treatment bias due to strategically-timed marriages, this paper limits "treatment" and "control" groups to the most comparable individuals and families possible.

⁵¹ A significant practice of will-writing would bias estimates of legal impact downward, towards a null effect. Written wills appear extremely rare. Roy (2012: 9) points to newspaper reports that 80% of Indians die without wills (See: <http://timesofindia.indiatimes.com/Avoid-disputes-write-a-Will/articleshow/802650.cms> ; <http://www.fpgindia.org/2011/07/writing-a-will-know-some-facts.html>). Only a handful of interviewees acknowledged writing wills. In contrast, the practice of making sada beinama or oral contracts formalized in the presence of village elders is popular in Andhra Pradesh. Use of these informal contracts in court is complex and frequently contested.

⁵² These results are available upon request. A third strategy, leveraging groups ineligible for reform based on their landholding status as a placebo group, yields the same results as the two major strategies for constructing comparison groups. These results are available upon request.

⁵³ Analysis follows Goyal et al., Roy, and Rosenblum in using difference in difference estimations.

Fixed effects are included to control for persistent differences across states. Time fixed effects, based on a given household head or daughter's year of birth, depending on the regression specification, are used to control for regional time trends in the distribution of inheritance to daughters. Control variables are based on the characteristics that vary significantly according to the descriptive statistics. These variables include indicators of daughters' years of schooling, caste status, the level of monetary dowry paid by a daughter's family to her husband's family upon marriage, and the number of daughters in a given family. The remainder of this section explains each strategy of creating appropriate comparison groups and describes the results of OLS regression analysis for each comparison group.

Geographically-based Comparison Groups

The geography of state boundaries provides an ideal method for constructing a sample of individuals from geographically- and culturally-similar districts with different timing of reform's implementation. The 1956 demarcation of territory once contained in the British Colonial provinces of Bombay, Madras, Coorg and Cochin as well as in the Princely states of Mysore and Hyderabad into linguistically-based states was particularly messy along the multi-lingual, multi-cultural borders of the resultant South Indian states, as explained by Radu Ban and his co-authors (Ban, Jha, and Rao 2012, 7-10). As a result of the messiness of state formation at these border zones, the population residing in border districts shares not only a common geography, climate, languages and social traditions associated with languages. They also have a common experience of history, having been a part of common administrative entities for over two centuries (Ibid).⁵⁴

The neighboring states of Andhra Pradesh, Tamil Nadu and Karnataka, whose territories intersect around Andhra Pradesh's southern and south-western borders (respectively), enacted inheritance reform in different years (1986, 1989 and 1994, respectively). Reform's differential timing is driven by the challenges of assembling

⁵⁴ Radu Ban, Saumitra Jha and Vijayendra Rao provide a much tighter comparison of "mistakes" on the borders of modern South Indian states. Unfortunately, exact replication of their methodology is not possible with REDS data.

political coalitions for reform, rather than by fundamentally different political, social or economic institutions. In each state, social reformers were able to build political consensus that gender-equalizing inheritance reform was an effective tool for capturing the increasingly-important female vote (Kohli 1994; Nelson 2011). Once elites observed reform's vote-garnering potential, reform's implementation hinged on the time-consuming process of assembling legislative coalitions. Reform's differential timing across neighboring southern states is thus best-understood as a reflection of the transmission time required to observe and replicate effective vote-garnering strategies by similar political parties across state borders. Comparing individuals in neighboring districts at the tri-state border essentially creates a group of similar people from similar places whose exposure to inheritance rights depends solely on their placement relative to state borders.⁵⁵

The National Council of Applied Economics' Rural Economic and Demographic Survey (REDS) allows for comparison of eleven districts around the three states' borders: Chittoor and Anantpur in south western Andhra Pradesh; Chennai, Vellur and Kancheepuram districts in northern Tamil Nadu; and Raichur, Bellary, Bangalore, Bangalore-Rural, Chitradurga and Kolar districts in eastern and south-eastern Karnataka, as identified in Figure 1. The district's specific locations are shown in figure 2.

[Figure 2 about here.]

Additionally, the descriptive statistics presented in Figure 4 confirm that families living at these state borders do not differ significantly based on whether or not they are "treated" by reform.⁵⁶ "Treated" and "untreated" daughters are born into families with statistically-similar characteristics, particularly in terms of the characteristics that are likely to drive their ability and interest in complying with inheritance law, including: mothers' and fathers' levels of education (according to years of schooling), number of

⁵⁵ State borders' location is based primarily on the dominant linguistic group in a given region (Telugu speakers in Andhra Pradesh, Tamil in Tamil Nadu and Kanada in Karnataka). However, the groups at these regional borders share significant linguistic and cultural characters which make the placement of state borders essentially random as cultural markers.

⁵⁶ "Treated" individuals are those who are eligible for gender-equal inheritance rights, e.g. women whose fathers die after inheritance reform and who marry after reform.

children, and the acreage of land owned. Members of Scheduled Castes and Tribes are a minority in both groups.

[Figure 4 about here.]

Overall, Figure 4's descriptive statistics confirm that the geography of state borders allows us to create a statistically-similar group of individuals 'treated' and 'untreated' by reform such that we can create a reasonable approximation of random assignment to treatment and control groups. This subset of REDS data provides one way to measure reform's impact independent of variation in culture, geography, and political and economic institutions.

To check the representativeness of the daughters studied in the sample of districts bordering Andhra Pradesh, Karnataka and Tamil Nadu, Figure 6 compares the characteristics of families in the primary dataset used, the Rural Economic and Demographic Survey (REDS), gathered by the National Council of Applied Economic Research (NCAER) in 2006/8, with an alternate dataset: the India Human Development Survey, gathered by NCAER and the University of Maryland in 2005. The India Human Development Survey 2005 (IHDS) is a nationally representative survey of 41,554 households in 1503 villages and 971 urban neighborhoods across India. Two one-hour interviews in each household covered health, education, employment, economic status, marriage, fertility, gender relations, and social capital. The IHDS provides a good check for the sub-sample's representativeness as it surveys a much larger set of women in rural regions of the tri-state border districts than REDS: the comparable samples of women surveyed are 7801 and 750, respectively.

[Figure 6 about here.]

The basic descriptive statistics for comparable questions, presented in Figure 6, show most of the key characteristics to be similar across the IHDS and REDS samples: similar proportions of daughters, fathers and sons receive education. At the village level, there are similar proportions of "Hindu" populations subject to reforms of Hindu personal law and similar proportions of traditionally disadvantaged Scheduled

Castes.⁵⁷ Overall, comparison of REDS with the IHDS sample suggests that despite the relatively small subsample of women at the tri-state border in REDS, the survey provides a representative subsample of the population.

Analysis of Reform's Direct Impact on Land Inheritance Equality

The analysis of inheritance reform's direct impact across families, for the sample of households living in districts at the tri-state border, calculates the following OLS regression:

$$\frac{\text{Acres inherited}_{ist}}{\text{Acres inheritable}_{hst}} - \frac{1}{\#\text{inheritors}_{hst}} = \beta_0 + \beta_1 \text{Death}_{ist} + \beta_2 \text{Marriage}_{ist} + \beta_3 \text{Death}_{ist} * \text{Marriage}_{ist} + \sum_s \text{State Effects}_s + \sum_t \text{Time Effects}_t + \gamma \text{Controls}_{ist} + \varepsilon_{ist} \quad (1)$$

As explained in the prior section, the dependent variable is equality of a given daughters' land inheritance share, for a given daughter i , from natal household, h , living in state s , and born in year t . Negative fractions indicate a daughters' share is smaller than equality, and positive fractions indicate her share is greater than equality. The independent variable of interest is the interaction of the "Death" and "Marriage" indicator variables, which is set to one when a daughter is eligible for gender-equal inheritance rights and zero otherwise. As such, β_3 is the coefficient of interest, which measures the effect of eligibility on the equality of a given daughter's share of her family's land inheritance.

The results presented in Tables 1 and 2 provide a useful comparison of the contrast between prior measures of reform and the innovations applied in this paper. Table 1 provides a measure of reform in the spirit of Goyal et al. (2012), who measure the impact of reform on daughters within reformer states in comparison to daughters in states that did not pass similar reforms. While the majority of specifications show no

⁵⁷ The differences between the IHDS and REDS samples are most striking in the case of the proportion of mothers receiving an education (65 versus 35 percent, respectively). However, given that the proportion of daughters receiving an education are similar, it is fair to assume that differences in mothers' education levels are not significantly biasing their willingness to educate and support daughters.

statistically significant impact of reform, two specifications in this table (Columns 5 and 7) find a positive and significant impact of reform as do Goyal and her coauthors. However these measures of reform's impact suffer from serious omitted variable bias: it is impossible to distinguish the effect of a given state's intent to implement gender-equalizing reform from the effect of reform itself. A range of variables may determine both states' intent to reform and the effect of reform, including social norms about the importance of gender-equality, women's participation in the workforce, and/or women's historical trajectories of formal and informal political empowerment.

Reform's impact remains positive but becomes statistically insignificant when using better-specified geographically-bounded comparison groups (Column 1, Table 2). The result remains unchanged after applying the legally-appropriate measure of reform (Column 2, Table 2). Columns 3-7 in Table 2 attempt to capture the short-term impact of reform on behavior by narrowing the sample to include only those daughters whose fathers pass away within five years of reform. Although reform appears to have a significant, positive impact for this narrower group (Column 3, Table 2), the result is neither robust to inclusion of controls for individual characteristics nor inclusion of state fixed effects to capture state-specific inheritance trends.

Overall, Table 2's difference in difference estimates indicate that reform has a positive but insignificant direct impact on daughters' inherited share of their natal family's land. Given the insignificance of reform's impact across nearly every specification in Tables 1 and 2, it is highly unlikely that reform has a direct impact on the distribution of daughters' inheritance shares.⁵⁸

⁵⁸ Two additional analytic strategies are possible: (1) intra-household analysis of daughters' inheritance shares, for families with at least one daughter eligible for reform and one daughter ineligible for reform, due to the requirement that daughters marry post-reform to be eligible; and (2) consideration of a 'placebo group': daughters who are never exposed to inheritance reform because they are born into landless households, for whom land inheritance reform is irrelevant. Analysis of both cases confirms the results presented in Table 1 and is available upon request.

A Theory of Legal Enforcement & Local Accountability

Extensive field research points to the importance of the political process of legal enforcement in rural south India, which is grounded in social as well as legal institutions. This section begins by outlining a theory of reform's impact conditional on local enforcement, after which it provides a more detailed explanation grounded in nearly two years of field research. The next section returns to the empirical data to test this theory.

If we assume that local officials' enforcement varies in rigor across India, it is plausible that variation depends on officials' perception of a given law's salience and enforcement's cost.⁵⁹ Where elected officials are responsive to women's demands, the salience of gender-equalizing reforms –which have significant potential benefits for women who are willing to alter the *status quo*– should be higher and the cost of enforcing such reforms should drop thanks to the inclusion of daughters' voices in determining and evaluating the scope of legal enforcement. Such action should create a virtuous cycle for legal enforcement: where local elected officials are more responsive to women, households should increasingly make decisions with the *ex-ante* assumption that gender-equalizing law will be enforced, thus reducing the cost of legal enforcement for local officials. In contrast, local officials' potential for complicity in resisting reform is high where officials are accountable to male household heads who benefit from the *status quo*.

Bottom-up Theory Building

The remainder of this section builds theory based on interviews conducted with local and national political officials, lawyers, academics, activists, and rural agriculturalists, to capture the strategic logic behind enforcement of inheritance reform law. Qualitative fieldwork occurred in six districts of Andhra Pradesh (Figure 3). Districts were selected to represent the range of local capacities to supply and demand legal

⁵⁹ A forthcoming paper will examine which socio-political factors explain village-level gender-bias in officials' accountability.

enforcement – based on location near the state government’s center (Ranga Reddy) vs. periphery (Srikakulam and Visakhapatnam), as well as in resource-rich regions (Krishna) and resource-poor regions (Khammam and Ryalaseema), with various histories of support for vs. contestation of the state (Krishna vs. Khammam).

[Figure 3 about here.]

Two sets of factors are crucial in local officials’ strategic calculation of enforcement: their ability and willingness to supply enforcement; and local citizens’ and groups’ demand for enforcement that supports vs. subverts gender-equalizing land inheritance reform. For the sake of expositional clarity, I address these factors independently but request readers to bear in mind the interlinked nature of these phenomena.

Supply-side Enforcement

The relevance of legal title to inherit land begins – and often ends – with access to the Village Revenue Official (hereafter VRO).⁶⁰ Indeed, at the village level it is difficult to distinguish the “State” from the land revenue bureaucracy. As Andhra Pradesh’s most recent Special Chief Secretary, Smt. Minnie Mathew, IAS explains to VROs: “you are the eyes, the ears, and the face of the government, because at the village level you *are* the government” (Mathew 2012).

Officially, the village revenue officer is responsible for maintaining, monitoring, and transferring records of land titles and land cultivation and collecting relevant taxes (Baden-Powell 1882; Government of India 2008).⁶¹ The VRO’s enforcement of gender-equal land inheritance arises as a result of individual requests to transfer land

⁶⁰ VROs’ title varies: *karnam*, *lekpal*, *munsiff*, *Panchayat* secretary, *patwari*, village assistant, village land revenue officer, or *watandar* are also used, depending on the region and the type of land revenue bureaucracy that existed pre-Independence.

⁶¹ When applicable, village land revenue officers also collect land taxes and record cultivators’ payment.

title to their name. ⁶² Unofficially, enforcement varies greatly with “local understandings of the law. This includes whether or not the *patwari* [VRO] is willing to write down women’s [ancestral land] shares and whether women can demand partition or not.”⁶³

VROs’ reluctance to enforce inheritance reform is widespread: out of 1,192 interviews across Andhra Pradesh, no one reported receiving ancestral land due to a VRO-initiated land transfer. VRO’s absence in transferring ancestral land to women appears pointed, given that their responsibility to enforce women’s inheritance rights has existed for a quarter century in Andhra Pradesh. The absence of legal enforcement is particularly astonishing throughout a time period when the “Andhra model” has become synonymous with “smart governance,” which increases local government’s transparency, effectiveness, and engagement with marginalized groups (Mooij 2003).⁶⁴ Indeed, as of 2005 Transparency International ranks Andhra Pradesh as the fourth-to-least corrupt state in India out of the 20 ranked states (Bussell 2012).

Interviews with land revenue officials suggest that their reluctance to enforce gender-equalizing land inheritance reform is due, at least in part, to the disjuncture between “the law on the books and social practice” (Galanter 1978, 496). This discrepancy was especially clear after I spoke at length with a longstanding member of the land revenue bureaucracy in Andhra Pradesh who claimed that “post-1986 [after the Hindu Succession Act Amendment] all daughters are getting equal shares of land so

⁶² Ancestral land acquired by succession is jointly-held by all eligible family members (coparceners) until partition is requested. If partition is agreed upon by all, the individuals requesting partition acquire their shares of ancestral land as privately-held property. State-level amendments to the Hindu Succession Act require the local VRO to transfer (mutate) equal shares of ancestral land to daughters, sons and the surviving spouse, for all legally-eligible individuals (based on father’s date of death, daughters’ marriage date, the absence of a will and the absence of the land’s prior partition). Transfers are initiated upon a surviving family member’s request to register a land acquisition. To formalize land titles, individuals are required to register land acquired by succession and other means with the VRO, within 90 days of their acquisition (Andhra Pradesh 1993). Following a request, the VRO is required to publish the request and solicit objections from the other coparceners – that is, all family members entitled to jointly own the ancestral property (Andhra Pradesh 1993). Disputes about land title and succession are adjudicated within the land revenue bureaucracy’s judicial system. In principle, the VRO’s default procedure would be to register all coparceners as joint owners absent valid legal objections.

⁶³ Personal interview with Bina Agarwal, New Delhi, India, 8 December, 2009.

⁶⁴ SMART governance refers to “simple, moral, accountable, responsive and transparent” governance.

contestation [of inheritance] is not necessary”.⁶⁵ Yet once the interview concluded and I left the official’s office, his subordinates –VROs– explained their reluctance to transfer land to daughters without a family-wide agreement, “to avoid causing discord or trouble in the family”.⁶⁶

Officials’ (un)willingness to transfer land titles is most powerfully influenced by pressure from the preeminent local elected official – the *Pradhan* or village chief.⁶⁷ *Pradhans*’ ability to sway local application of the law is well documented throughout the past and the present (Brass 1997; Srinivasan Forthcoming). Given the importance of political good will for bureaucrat’s careers, particularly in the highly-politicized land revenue system, the *Pradhan*’s expressed preferences are likely to have considerable weight with the VRO (Iyer and Mani 2012).

Additionally, local political dynamics can influence the *Pradhan*’s willingness to demand VRO’s enforcement of land transfers – either in accordance or contradiction with the law. *Pradhans* are well aware that a given enforcement action has the ability to improve or erode their reputation for efficacy and fairness. As women become aware of their demands’ relevance for local politics, they tap into a wealth of strategies for securing and subsequently leveraging local officials’ support. As a politically-active member of a village Self Help Group for women in Visakhapatnam District explains, as women “are getting organized” in local finance and politics, this creates “a lot of awareness among women” which gives their voice legitimacy both in political and intra-household decisions. This organization and women’s subsequent political and economic involvement creates a virtuous cycle of women’s inclusion in distribution of the most fundamental rural resource – land: “they are now getting their due share from the properties of their parents, in-laws and husband.”⁶⁸ Such virtuous cycles increase officials’ incentives to proactively supply enforcement.

⁶⁵ Personal interview with a Land Revenue Administrator, Khammam District, Andhra Pradesh, 25 March, 2010.

⁶⁶ Ibid.

⁶⁷ Additional sources of pressure on local officials include village elders, political parties, social associations organized around caste, class groups or women’s rights, or economic associations such as labor unions or micro-credit groups.

⁶⁸ Author’s personal survey with SERP, 21 February, 2011, RePa.

Additional sources of influence include officials' cost-benefit analysis of enforcement's value based on the potential for side-payments from related parties for enforcement.⁶⁹ How much do expectations of personal rewards color officials' enforcement decisions? Enforcement's ill-gotten gains encompass a range of informal side-payments that could include expenses to "convince" the VRO to locate, update, sign, and share the relevant files (title deeds, cultivation records, and/or passbooks).⁷⁰ Local land revenue officials have historically been vilified as the "white ants that eat away at the umbrella of the state" (Frykenberg 1965).

Direct observation and interviews confirmed the importance of side-payments to VROs, which range from hundreds to hundreds of thousands of rupees. Yet, field research also indicated the power of a path around corruption for rural women: where the local *Pradhan* is female, local women are able and frequently willing to approach the *Pradhan* directly with their demands for help using the public legal system.⁷¹

Demand-side Enforcement

Gender-equalizing land inheritance reform alters two facets of individual-level demand for enforcement by local officials, as seen through the lens of my fieldwork in Andhra Pradesh: first, within the law, landholders demand local officials' collusion in manipulating inheritance law. In contrast, daughters' individual-level demands for enforcement of gender-equal inheritance rights are nearly non-existent, due to their cost-benefit assessment, where the costs of breaking relationships with the natal family as a result of demanding legal inheritance rights outweigh the largely uncertain

⁶⁹ One high-ranking land revenue administrator acknowledged that although the official fees associated with 'mutation', e.g. transferring land title following a family member's death are only Rs. 10 (25 cents), the process is "actually very expensive". In terms of time costs, 30-45 days are required for officials to issue circulars announcing a mutation and the associated process of soliciting and considering family members' objections. Personal interview with Joint Collector for Warrangal District, Andhra Pradesh, 8 November, 2010.

⁷⁰ Confirmed by personal interview with Joint Collector for Warrangal District, Andhra Pradesh, 8 November, 2010. Additionally, individuals must frequently pay huge sums to convince a range of intermediaries to move a given case forward as expediently as possible within India's unwieldy bureaucracy (Galanter and Dhavan 1989; Reddy and Haragopal 1985).

⁷¹ Confirmed by personal interviews with women in villages with a female *Pradhan*.

benefits of legal rights. Second, individuals aggregate in groups to informally demand enforcement in light of women's legal rights.

Demand for enforcement by heads of landholding households and their sons who seek to manipulate reform's impact via collusion with local officials appears to be growing post-reform. Such demand, while legal, is aimed at legal evasion through either an increased focus on the registration of oral wills or by selectively-consulting family members before registering transfers of land inheritance.⁷² Although written wills are extremely rare in rural India, another type of will that fuses traditional and legal practice - oral wills called *sada beinama* ("white paper"), usually written to justify traditional, patrilineal inheritance – are more popular. However, the enforcement of these wills is generally a personal rather than a legal affair; enforcement hinges on local officials' collusion whenever wills are contested, as is frequently the case.⁷³

Officials' collusion with sons following a father's death is possible due to two factors – distance and a dearth of records. Daughters usually move away from home to a distant village upon their marriage, making coordination at the time of mutation easy to overlook. Additionally, VRO's discretion is paramount in determining family preferences for the distribution of inheritance.⁷⁴ VROs frequently collude with male family members, transferring land records to sons after fathers' deaths in explicit contradiction to land inheritance reform.⁷⁵

Daughters' demands for enforcement of their legal rights could plausibly counterbalance male household heads' frequent demands for VROs to collude in

⁷² Wills enable their writers – household heads – to make daughters ineligible for gender-equalizing inheritance reform, as reform only equalizes daughters' land rights if the prior household head (father) dies without a will. Low levels of literacy are a barrier to widespread writing of formal wills for all but the most lucrative plots of land (Personal focus group interviews with agriculturalists in Rangapuram Village, Konchikarcherla Mandal, Krishna District, 16 April, 2010). Still, oral wills are recognized within Andhra Pradesh as (SERP 2010). One VRO claims to have seen a significant increase in the registration of legally-binding oral wills, or *sada beinama* (white papers) over the past decade, following rising land prices and growing legal awareness (Personal interview with Land Revenue Administration, Khammam, Andhra Pradesh, 25 March, 2010).

⁷³ Personal interview with Ex-Deputy Collector, Raja Rao, on 24 March, 2010. This interview confirmed widespread consensus across interviews with current and former land revenue officials, political officials, lawyers, and extensive review of land revenue records.

⁷⁴ Ibid.

⁷⁵ Personal interview with S. Sambasiva Reddy, LLM, and Ms. Radhika, LLM." Vijayawada, Krishna District, Andhra Pradesh, 18 February, 2011.

manipulating inheritance reform. Yet, daughters' reluctance to demand inheritance was visible in 80 percent of 1,200 interviews. Why? Daughters' reluctance is due to the uncertain benefits of demands for land inheritance rights, which are constrained by formal officials as well as by widespread social norms, whereby demanding inheritance severs all ties with their natal family.⁷⁶

One woman from a small village at the edge of Andhra Pradesh's capital explains the cost-benefit analysis precisely: "Relations are more important than money [via land inheritance]. Money is needed now, but relations are important in the future. This is why we don't fight with our parents. We lose our security if we fight with our parents, if [I then] have a problem with my in-laws. This is why everyone keeps quiet".⁷⁷ In light of the significant relational and security-based cost of demanding uncertain property rights, daughters' widespread decision not to 'rock the boat' is rational.

Parents' support for patrilineal inheritance reform is undergirded by a household-level political economy of extensive capital investment in sons to secure long-term support for elder parents.⁷⁸ Over ninety percent of the 692 women in focus groups planned to live with sons. Mothers frequently made the connection between sons' care and inheritance explicit: "Because I have to stay with sons only, not with daughters, so I

⁷⁶ Despite its illegality, ever-more-popular dowry severs parents' obligations and seals a husband's family's responsibility for the bride's security. Although this money is mainly consumed by wedding celebrations, the dowry is traditionally regarded as a daughter's "fair" share of her parents' inheritance. In fact, dowry is often expensive enough that: "soon after the birth of the girl most parents are terrified thinking about the responsibility of marrying her..." (Pal Chowdhury (1914: 42-43); Sachitra Panapratha, c.f. Majumdar 2009: 114). Despite the symbolic security of marital vows and dowry exchanges, most daughters work to maintain their natal family's good will as a secondary source of security, should less deeply-rooted ties with their marital family be uprooted by widowhood, abandonment, or abuse. The knowledge that rising dowries are associated with rising mistreatment of brides makes such concerns eminently practical. (Bloch and Rao 2002; Anderson 2003)

⁷⁷ Personal interview in Rayaprolu, Ranga Reddy, Andhra Pradesh, 17 February, 2011. The worst-case scenario of daughters' demands is vividly portrayed in one story: "A woman from K_ village, Amma, filed a case in the court against her brothers and parents, seeking share in their property. She got her share through the court. But, when she dragged them to the court, her elder brother died of cardiac arrest, while [her] parents suffered badly. They severed the relationship with Amma... The people say that she had won the property but had lost the parents... It was a lesson for all of us in the village" (Author's survey with SERP, 21 February, 2011; TS, Krishna District).

⁷⁸ This logic is developed at length in a companion paper on reform's unintended consequences. Additionally, evidence of a relationship between care for elder parents and patrilineal inheritance, both in India and more globally, can be found in Anderson (2003), Botticini and Siow (2003), Fafchamps and Quisumbing (2008) and Roy and Tisdell (2002).

[will] give to sons only.”⁷⁹ The normative and physical constraints that break parents and daughters’ bonds at marriage also make adult daughters unable to credibly commit to support elder parents. As a result of these ‘sticky’ norms and the household-level political economy that supports them, inheritance reform rarely encourages parents to give daughters land.

There is a limit to norms’ power: daughters are willing to upset the traditional balance of patrilineal land inheritance in response to either grave need or injustice. Given the combination of implicit, normative restrictions and explicit aggression that make it nearly impossible for women to “move on their own to police stations or courts,”⁸⁰ daughters’ demands are successful to the extent that they can leverage either traditional sources of pressure – village elders and officials – or non-traditional pressure groups such as all-women Self Help Groups (SHGs) which enable women to make public demands *en masse* which they could not make singly.⁸¹ While elders are best able to enforce normative sanctions on a given family, the support of local officials – including the Pradhan and police – are frequently required to enforce land inheritance distribution in contradiction to brothers’ wishes.⁸²

⁷⁹ Personal interview in Chennampalli, Bukkarayasamudram, Anantapur, 30 November, 2010 (Group1.R2).

⁸⁰ Personal interview with property lawyers in Vijayawada, Krishna, 18 February, 2011.

⁸¹ Pressure groups also include women’s solidarity groups who advocate for women’s inheritance rights. These groups can provide significant leverage to women seeking inheritance rights, as is clear from nationally-publicized inheritance cases (*Mrs. Mary Roy Etc. Etc vs State Of Kerala & Ors on 24 February, 1986; Madhu Kishwar & Ors. Etc vs. State of Bihar & Ors on 17 April, 1996; Jane Antony, Wife of Antony vs. V.M.Siyath, Velloparambil on 25 September, 2008; George 2010; Kishwar 1999*). The solidarity organization that women most frequently cited as their vehicle for legal information and empowerment grew out of Andhra’s Self Help Group (SHG) movement, which began in 1979. Women in SHGs gain influence thanks to the pressure of their combined voices, as well as their ability to “operate with large sums of money, have high levels of access to public officials, and have direct access to formal financial capital” (Personal interview with a land revenue administrator in Khammam District, AP, 25 March, 2010).

⁸² Author’s personal survey with SERP, 21 February 2011, DUm. It is notable that both traditional and non-traditional forms of pressure can also be used to evade reform’s impact. For example, Matthew Nelson describes pressure groups in neighboring Pakistan as unified by “kinship-based notions of ... ‘custom’, tied to specific expressions of kinship-based economic and political solidarity” who use legal reform as a tool for consolidating patrilineal inheritance and political power (2011, 3). Most resistance focuses on precluding daughters from inheritance rather than pressuring women to relinquish inheritance. In extreme cases, such pressure takes the form of physical assaults and murder (Roy and Tisdell 2002, 322).

Overall, this qualitative investigation suggests that political institutions meant to enforce reform are subject to widespread manipulation by local officials who calculate context- and case-specific cost-benefit analyses before determining whether or not to supply enforcement in line with gender-equalizing reform. Additionally, manipulation in the demand for enforcement originates from male household heads (fathers or their surviving sons) who act to collude with officials in manipulating their exposure to reform. In contrast, daughters' cost-benefit analysis of inheritance rights makes demand for the law's enforcement irrational. Finally, pressure groups can, and often do organize to demand that local officials enforce a particular distribution of inheritance rights. The simplest and most effective pressure point is often to act via an elected official. When officials act to support women's legal rights, they can create a virtuous circle of increasing enforcement causing increasing demands by women for greater enforcement.

Assessing Reform's Impact Conditional on Local Accountability

According to the theory of heterogeneous legal reform presented above and developed with reference to observational evidence, reform's impact should vary based on local officials' accountability to stakeholders' demands, which can significantly influence local officials' calculation of the costs and benefits of legal enforcement in support of or resistance to reform.

A unique policy experiment conducted by India's central government allows me to examine the impact of one method of increasing local officials' accountability to women: setting aside randomly-chosen seats in local governments for women, one election at a time.⁸³ As a result of these "reservations," only female candidates can run for election in localities reserved for women, which means that women are exclusively elected for these seats. Prior work describes the "silent revolution" in women's

⁸³ I refer to the 72nd and 73rd constitutional amendments, passed in 1992, which directed India's state governments to conduct elections at local levels, devolved expenditure and oversight powers to these elected bodies, and mandated the reservation of one-third of seats in these bodies for women. The amendments also reserve seats for members of the scheduled castes and tribes, which are less relevant for this paper's analysis.

political representation that followed: women’s share of elected seats in government rose from 3 to 9 percent in state and national legislatures pre-1992, to over one third of seats in local bodies post-1992 (Bhavnani 2009). Evidence shows that in the presence of reservations, local governments increase their provision of women’s preferred public goods (Chattopadhyay and Duflo 2004). Additionally, reservations’ positive impact on women’s electability is shown to persist after they are withdrawn (Bhavnani 2009). In sum, prior work provides reason to believe that a village’s randomly-assigned experience with women’s reservations may increase local officials’ accountability to women.

Based on the aforementioned work, I re-examine inheritance reform’s impact on the equality of daughters’ land inheritance in light of reservations, as an exogenous source of officials’ accountability to women. Analysis is presented using the sample of households located at the tri-state border (as in Table 1).⁸⁴ Equation 2 modifies the first equation in order to capture the household-level impact of reform. OLS regressions take the following form, where the measure of accountability is a village-level variable that indicates whether or not any of the prior three elections had been randomly-selected, at the state-level, as reserved for women prior to REDS:⁸⁵

$$\frac{\text{Acres daughters inherited}_{hst}}{\text{Acres inheritable}_{hst}} - \frac{\# \text{ daughters}_{hst}}{\# \text{ inheritors}_{hst}} = \beta_0 + \beta_1 \text{Legal Eligibility}_{hst} + \beta_2 \text{Reservation}_{vst} + \beta_3 \text{Legal Eligibility}_{hst} * \text{Reservation}_{vst} + \gamma + \varepsilon_{hst} \quad (2)$$

where the dependent variable of interest is the extent to which the share of household land inherited by daughters approaches a “fair share” for household h in state s , whose head is born in year t . Daughters’ “fair share” is calculated as the difference between the fraction of parental landholdings that daughters inherit and the fraction of the household head’s inheritors that daughters constitute. The number of persons legally-

⁸⁴ Results of intra-household regression analysis are available upon request.

⁸⁵ As in Equation 1, state fixed effects are included to control for persistent differences in daughters’ inheritance across states. Time fixed effects are based on the household head’s year of birth. These are included to control for time-specific trends in daughters’ inheritance –for example based on parental approaches to raising children and distributing opportunity – that are constant across the region under study. In order to account for the two large sources of variation in family-level attributes noted in Figure 4, I estimate the regression with controls for membership in a Scheduled Caste and landholding status (parents’ owning less than 2 acres of land). As in prior regressions, standard errors are clustered at the village level to account for variation in survey teams’ approach.

entitled to inherit the household head's land is the sum of the family's daughters, sons, and the surviving spouse. This variable ranges between -1 and 1, with the same interpretation as Equation 1's dependent variable, aggregated to measure the equity of daughters' collective inheritance share within a given natal family.

Equation 2's independent variable of interest is a household-level indicator of the interaction of eligibility for reform and a village's experience of being randomly selected to have female-only elections for a village head (*Pradhan*) any time in the prior three elections, when such reservations have been nationally-mandated. *Legal Eligibility_{hst}* is set to one if a given natal household's head passed away after reform and at least one daughter in the family married after reform, and is zero otherwise. *Reservation_{vst}* is set to one if a village has been randomly-selected as 'reserved' for female-only *Pradhan* candidates in any of the past three elections, and zero otherwise. The coefficient of interest, β_3 captures the effect of legal eligibility on the household-level distribution of land inheritance to daughters in villages where the elected head, or *Pradhan*, has been randomly-selected as female in any of the past three elections.

The findings presented in Table 3 show a consistent, strong relationship between local officials' accountability to women, as a function of village-level reservations for women officials, and improved gender equality in households' distribution of land inheritance to children. This relationship's statistical significance holds across all regressions using the well-specified sample of families whose fathers pass away within five years of reform (Columns 3-7), and is robust to inclusion of controls for caste and landholding status (Columns 4-7) as well as fixed effects for households' state of residence (Columns 5, 7) and time fixed effects based on the household head's year of birth (Columns 6-7). Overall, Table 3 provides evidence of inheritance reform's ability to improve gender equity when institutional changes increase local officials' responsiveness to women.

[Table 3 about here.]

Analysis of Reform's Impact & Officials' Subjective Accountability

The 2006/8 round of REDS allows additional analysis of local officials' accountability to their constituents. I rely on two survey questions to measure individuals' subjective assessments of local officials' varied responsiveness to men vs. women: (1) How easy it is for male household heads to hold officials accountable? and (2) How easy it is for a mother to hold the local government head [*Pradhan*] accountable? Patterns in NCAER's REDS confirm a significant, positive relationship between a village's experience of reservations and subjective assessments of local officials' accountability to women: officials in villages where elected seats have been reserved for women are 30 percent more likely to be highly-responsive (vs. poorly-responsive) to women.

Analysis of Reform's Impact & Officials' Subjective Accountability to Women

An innovative question on accountability from REDS surveys allows this paper to capture another facet, albeit subjective, of officials' accountability to women. The survey asks respondents to evaluate what would happen if a relatively mundane, hypothetical scenario occurred in their village:

“Meenakshi, the four-year-old daughter of Rajesh fell ill after eating the food provided by the noon meal programme. When Lakshmi, the wife of Rajesh went to complain to the school, she was rebuked and asked to talk to the *Pradhan* (Panchayat President). She has since asked Rajesh to talk to the *Pradhan*.” [SURVEYOR THEN ASKS:] “How easy is it for Lakshmi to hold the local officials accountable for performing their functions?”

Options for evaluations range between 1 (“impossible”) and 5 (“not a problem at all”). Assessments of officials' accountability to women vary significantly within and across villages. OLS regression analysis uses the following equation:

$$\frac{\text{Acres daughters inherited}_{hst}}{\text{Acres inheritable}_{hst}} - \frac{\# \text{ daughters}_{hst}}{\# \text{ inheritors}_{hst}} = \beta_0 + \beta_1 \text{Legal Eligibility}_{hst} + \beta_2 \text{Accountability}_{hst} + \beta_3 \text{Legal Eligibility}_{hst} * \text{Accountability}_{hst} + \gamma + \varepsilon_{hst} \quad (3)$$

Equation 3's independent variable of interest is a household-level indicator of the interaction of eligibility for reform and assessments of local officials' accountability to women, averaged at the household-level. $Accountability_{hst}$ is a continuous variable ranging between 1 (impossibility of holding local officials accountable) and 5 (perfect accountability).⁸⁶ The interaction of the prior two variables, $Legal\ Eligibility_{hst} * Accountability_{hst}$ indicates the household head's assessment of local officials' accountability for households with at least one daughter who is eligible for reform, and is zero otherwise. As such, β_3 is the coefficient of interest, which captures the effect of legal eligibility for a household's daughter(s), conditional on local officials' accountability to women, on the extent to which daughters' inheritance share approaches a gender-equal distribution.

[Table 4 about here.]

Table 4's findings indicate a positive, direct relationship between local officials' accountability to women and the impact of reform on daughters' land inheritance shares' equity across nearly all specifications. In fact, in the best-specified regressions (Columns 6-7), there is a significant, positive relationship between officials' accountability to women and the equity of daughters' land inheritance shares. The regression results in Columns 6 and 7 indicate that a one-unit increase in officials' perceived accountability to women is correlated with an increase in the equity of daughters' inheritance shares by 40 percent, at the margin. Columns 6 and 7 suggest a net improvement of 39.5 percent in the equity of daughters' land inheritance shares as

⁸⁶ Amongst households at the tri-state border, 25 percent consider officials extremely unaccountable to women (a rank of 2.5 or lower, e.g. accountability is "quite difficult" to "impossible") and 33 percent rank officials as highly accountable to women (a rank of 4 or higher, e.g. accountability is "very easy" to "no problem"). Within the sample of districts at the tri-state border, Chennai, Tamil Nadu has the highest average score (3.85), followed by Chittoor, Andhra Pradesh (3.51). The districts with the two lowest average rankings are Bellary, Karnataka (2.08) and Vellore, Tamil Nadu (1.67). When responses are averaged at the state level, accountability rankings are quite similar to Transparency International's 2005 assessment of corruption (Bussell 2012) : Kerala has the highest average score (4.09), and Bihar has the second-to-lowest (3.07). However in REDS, the state with the lowest average accountability of local officials to women is actually West Bengal (2.70).

a result of inheritance reform that is implemented in locations where officials are perceived as accountable to women.⁸⁷

To understand how reform's impact varies with local officials' accountability to women, I examine the estimated interaction effect graphically (Figure 5). The figure illustrates that reform is able to improve the equality of eligible daughters' land inheritance shares where local officials are moderate-to-highly accountable to women (values of 3-5). Amongst this set of daughters, the higher the assessment of local officials' accountability to women, the more reform is able to move their land inheritance share closer to equality. In contrast, reform has a statistically insignificant impact where local officials are assessed to be extremely unaccountable to women. In other words, where it is "impossible" or "very difficult" for women to hold local officials accountable (values of 1 and 2), reform is an ineffective tool for improving the gender-equality of daughters' land inheritance.

[Figure 5 about here.]

Analysis of Reform's Impact & Officials' Subjective Accountability to Men

OLS regression analysis follows equation 3, substituting a measure of local officials' accountability to *the male household head* for the initial measure of officials' hypothetical accountability to women. *In this case, Accountability_{hst}* is based on the following question: "How easy is it for you to hold local officials accountable for the functions they are supposed to be performing?" As above, *Accountability_{hst}* is a continuous variable ranging between 1 (impossibility of holding local officials accountable) and 5 (no problem).⁸⁸ As above, β_3 is the coefficient of interest, which

⁸⁷ Additionally, there is a persistent negative, significant relationship between local officials' accountability and the equity of daughters' land inheritance shares. This increases confidence in the nature and magnitude of officials' resistance to enforcing a gender-equitable distribution of land inheritance.

⁸⁸ The results presented here are based solely on the household head's assessment. Findings are consistent for a range of alternative specifications of accountability, including averaging all adult respondents in a given household's assessment. Results available upon request. Future regressions will test the robustness of this result when assessing local officials' accountability to a given household members as based on all respondents within a given village except the respondents from the given household. This will address the potential problem of a mechanical correlation between the errors of the dependent and independent variables.

captures the effect of legal eligibility of a household's daughter for gender-equal inheritance rights, conditional in this case on local officials' accountability to the male household head, on the extent to which daughters' inheritance share approaches a gender-equal distribution.

[Table 5 about here.]

Table 5's findings indicate a significant, negative relationship between local officials' accountability to men and the extent to which reform equalizes daughters' land inheritance shares (Columns 3-5). This holds for the broadest specification of reform's impact, in Column 3. The finding is robust to better-specification of the sample (Column 4), controlling for family characteristics which might alter families' gender-specific inheritance distribution (scheduled caste and landholding). The result also holds when controlling for state-level trends in inheritance distribution (Column 5). Notably, the negative relationship between officials' accountability and reform's impact on the equality of daughters' inheritance shares disappears after controlling for time trends based on household heads' year of birth (Columns 6-7). This may suggest that officials resist *implementing* inheritance reform only to the extent dictated by the attitudes popular amongst a particular age group of household heads, such as those heads whose age makes them particularly suited for high levels of involvement in local politics.⁸⁹

In summary, regression analysis of both subjective and objective assessments of local officials' responsiveness to women that reform results in an increase of 20 to 40 percent in the equity of daughters' land inheritance shares when local officials are perceived as responsive to women's demands (Figure 5).⁹⁰ In contrast, there is a significant, negative correlation between subjective assessments of official's

⁸⁹ Additionally, Table 5's regressions consistently find that where local government officials are more accountable to male household heads, daughters' inheritance shares shrink relative to an equal share. This result is robust to better specification of the sample by inclusion of only those households whose heads pass away within five years of reform (Columns 3-7), inclusion of controls for family characteristics (Columns 4-7), fixed effects for state-level trends in gender-specific inheritance distribution (Columns 5,7) and fixed effects for time trends in inheritance (Columns 6-7).

⁹⁰ Figure 8's finding is statistically-significant when accounting for time trends via fixed effects for the household head's year of birth.

responsiveness to the demands of male household heads and reform's marginal impact on legally-eligible daughters' inheritance share (Figure 7).

[Figures 5 and 7 about here.]

I interpret these results to indicate that the identity of the individuals to whom local officials are accountable is highly predictive of variation in gender-equalizing land inheritance reform's impact. In contrast to the initial empirical evidence of reform's null net impact, this evidence suggests that reform's impact is actually heterogeneous: it can significantly decrease or increase daughters' inheritance, depending on the nature of local officials' accountability.

Conclusion

This paper presents evidence of significant, heterogeneous effects of gender-equalizing land inheritance reform on the equity of daughters' land inheritance shares. Briefly stated, legal reform that contradicts deeply-rooted social institutions requires enforcement in a complex socio-political landscape. Gender-equalizing legal reform may succeed in changing behavior where instruments exist to address both the problem of inequalitarian institutions and legal enforcement. In particular, institutional changes that increase women's representation in local government also increase local officials' responsiveness to women, with significant positive benefits on inheritance reform's ability to improve gender equity. However, reform also may increase inequality when political institutions permit a "Coasean solution" to institutional reform: re-engineering enforcement to bolster traditional institutions.

**The Silence about Sex Ratios:
Unintended Consequences of India's Gender-Equalizing
Land Inheritance Reform**

Abstract

Using panel survey data for over 8,500 households, I find that the sex ratio of daughters-to-sons decreased for Indian women who became eligible for equal land inheritance. This reform made daughters more expensive in light of traditional marriage norms, whereby any investments in daughters “leak out” of the natal family upon daughters’ marriage. In contrast, reform did not change the cost of raising sons. As a result, reform increases daughters’ relative cost. Hence, I expect the ratio of daughters to sons to fall post-reform. Additionally, reform’s unintended consequences span multiple generations: reform reduces parents’ security in old age by limiting the resources available for investment in sons, as the traditional care-givers for elder parents. Indeed, being subject to the new legislation reduces sons’ willingness to care for elder parents. Reform is also found to have a second negative unintended consequence: increasing the size of monetary dowries parents pay to daughters’ husbands and in-laws-to-be upon their marriage, likely as an attempt to substitute dowry for daughters’ inheritance rights. These findings suggest that gender-equalizing reform can have serious negative, unintended consequences for the vulnerable populations they purport to serve.

“Where would it [inheritance reform] lead to? ... [A daughter] can [now] become a *karta* [head] of the family as a son is, but at the same time, the apprehension is...more frictions in the Joint Hindu Family may occur... I would consider that this would be trivial in nature, when we consider the amount of female foeticide that would take place.... Now, no law can restrict the society unless it rises up to protect the female foetus...” (Government of India 2005)

Introduction

When India’s parliament adopted ground-breaking legislation equalizing daughters’ rights to inherit land in 2005, one Member of Parliament described it as a step forward for women’s empowerment of historic proportions, such that “Today, we are very proud to tell the world: ‘Please look here.’”⁹¹ In the face of this buoyant optimism, other Members of Parliament raised serious concerns, arguing: “My apprehension is that this Bill may ... encourage female feticide in large number.”⁹² This paper presents evidence of socially-progressive reform’s extraordinary unintended consequences in line with political critic’s concerns: increased female infanticide. This work fits into a growing literature that attempts to assess legal reform’s costs and benefits.⁹³ The contribution of this paper is two-fold: first, it uses micro-level survey data to capture reform’s drastic negative consequences at the individual-level with significantly more precision than prior research (Rosenblum 2013); second, it uses a mix of qualitative and quantitative research to shed light on the causal mechanism at work: the political

⁹¹ Government of India 2005: Dr. Thockchom Meinya, MP, Manipur.

⁹² Government of India 2005: Sri. B. Mahtab, MP, Cuttack.

⁹³ On reform’s benefits, see: Goyal, Deininger, and Nagarajan 2012; Panda and Agarwal 2005; Roy 2012. According to theories of “bargaining in the shadow of the law”, inheritance reform may change bargaining power by altering individual entitlements. If so, India’s gender-equalizing land inheritance reform may increase daughters’ value via increasing their bargaining power, as per Agarwal 1994. On reform’s costs, see: Rosenblum 2013; Anderson and Genicot 2012; and a forthcoming working paper by Balhotra, Brulé and Roy.

economy of support for legal obligations versus social norms, which leads to individual behavior that promotes legal reform's perverse impact.⁹⁴

Why might equalizing daughters' rights to inherit land disempower daughters in India? To answer this question, one must first understand the social context. Take the case of a woman whom I shall refer to as Indra. She is highly educated, and amongst the privileged class of Indian women who have secured jobs earning enough to support the family. While her parents delayed her marriage for years in attempt to raise the dowry for a proper groom, Indra accepted a proposal from a man of another caste. Her husband is also highly educated, occupies a prestigious job in their town, owns a small parcel of land, and cares deeply for his wife. Together, already defiant of caste norms, they could create almost any family they wish. Yet, when Indra is pregnant with her first child, they both fervently hope for a son. Illegally, they perform an ultrasound with the willingness to abort if the fetus is female.

Why this extraordinary desire for a son? Parents sign a social contract with their sons: *this land on which we raise you is your land, and in return for this inheritance, you shall care for us until we die. Even then, you shall perform our funeral rites to ensure our spiritual completion.* In contrast, giving birth to a daughter is commonly believed to be "watering a seed in another's garden". From birth, parents teach daughters the importance of respect and responsibility for their husband and his family rather than for their natal parents. Parents' final, bitter task is to convince their daughters that all ties of mutual obligation are severed as soon as parents' final burden lifts: the payment of dowry to ensure daughters' welfare in the marital home. In this context, inheritance reform is another, even more serious malediction for parents of daughters. Reform essentially forces parents to consider daughters as an even greater loss: the security of their social contract with sons by giving away a portion of the land inheritance traditionally reserved for sons, which is the essence of their security in old age.

⁹⁴ This project fits into the literature on the political economy of support for informal institutions as a determinant of legal reform's impact: Ambrus et al. 2010; Blaydes and Linzer 2008; Dunning and Nilekhani 2013; Margetts et al. 2010. On the potential for backlash to reform by status-quo stakeholders, see: Abirafeh 2009; Anderson 2003; Anderson and Genicot 2012; Goodhart 1975; Harriss 1979; Kay 2011; Klarman 1994; Kranton and Swamy 1999; Mackie 1996; Mayaram 2002; Platteau and Peccoud 2011; Quisumbing 2004; Rao 2005, 2008; Rosenblum 2013; Scott 1998; World Bank 2011.

Argument

Gender-equalizing land inheritance reform makes daughters more expensive in light of traditional marriage norms. Mainstream norms dictate that any investments in daughters “leak out” of the natal family upon daughters’ marriage into husbands’ (usually) geographically- and socially-distinct family. In contrast, reform does not change the cost of raising sons. As a result, reform increases daughters’ relative cost. Hence, we should expect the ratio of daughters to sons to fall post-reform.

Indeed, I find evidence of a decline in women’s reported child sex ratio (daughters-to-sons) in villages and even within households where women are eligible vs. ineligible for gender-equal land inheritance. OLS regression results show a significant negative impact of gender-equal inheritance rights on women’s willingness to bear daughters relative to sons. A range of robustness checks ensure that the data sample is representative and that the significance of these results holds when using alternative measures of the sex ratio in a larger dataset. These results confirm suggestive evidence of increased female infanticide following passage of gender-equalizing land inheritance reform presented by Rosenblum (2013). Rosenblum uses state-level data to analyze trends in child mortality and fertility. I build upon Rosenblum’s hypotheses, and conduct more nuanced tests that identify reform’s impact on individual women and their families via individual-level survey data with measures of daughters’ eligibility for inheritance reform, reported sex ratios, monetary dowries, and reported survival rates for daughters and sons.

The proposed causal mechanism – reform’s increase of daughters’ cost – is twofold. The first dimension is existential: by mandating equal land inheritance shares for daughters and sons, reform requires parents break their social contract with sons: long-term care in exchange for the entirety of parents’ inheritance. This contract’s breaking is an act of injustice according to traditional norms, which also dissolves sons’ social obligation to ensure parents’ security and welfare in old age. The second dimension is purely material: the baseline cost of raising daughters is high because along with the ‘leakage’ of all investments in daughters, parents customarily pay a monetary dowry

to daughters' marital family to ensure their welfare post-marriage. Reform provides an impetus for payment of higher dowries by parents, who may try to substitute dowry for land inheritance to avoid breaking their social contract with sons.

Reform's unintended consequences do indeed affect parents' prospective view of their security in old age. In interviews, more than a quarter of mothers overtly expressed a fear of daughters' ability to claim inheritance and thereby reduce sons' motivation to care for them in old age. Women expressed this concern in terms of the need to "send daughters away":

"...we won't give [daughters] land even if they ask. If they care for us, then we will give [gifts] and send them away, that is all."⁹⁵

Legislators raised even more vehement concerns over gender-equalizing land inheritance reform's potential impact during debates over its passage:

"Where would it [inheritance reform] lead to? ... [A daughter] can [now] become a *karta* [head] of the family as a son is, but at the same time, the apprehension is...more frictions in the Joint Hindu Family may occur... I would consider that this would be trivial in nature, when we consider the amount of female foeticide that would take place.... Now, no law can restrict the society unless it rises up to protect the female foetus..." (Government of India 2005)

Following the concerns raised by legislators, I seek to capture gender-equalizing land inheritance reform's impact on daughters' value in terms of the sex ratio, that is, the ratio of daughters-to-sons reported. I focus on the sex ratio rather than female infanticide per se because of the absence of fine-grained data either on sex selection, access to sex-selection technology, or child mortality rates for the population on which I have panel survey data. Complementary econometric analysis with Sonia Bhalotra and Sanchari Roy identifies a highly significant direct impact of reform on female infanticide rates. I focus on the sex ratio of women eligible vs. ineligible for reform to

⁹⁵Author's interview of 10 April, 2010; Krishna district, G.S.

capture the impact of a woman's *exposure to reform* on the value she (and her husband) place upon raising daughters, relative to sons.⁹⁶

I use a difference-in-differences research design to assess the impact of laws aimed at equalizing women's rights to inherit land. Between 1976 and 1994, four states equalized Hindu daughters' rights to inherit their parents' ancestral land. 'Treatment' by reform is conditional on two major factors: marriage after reform's implementation and the death of one's father post-implementation.⁹⁷ In an ideal comparison, daughters would be randomly-assigned to treatment and control groups, such that their only significant difference is their inheritance rights (equal or unequal). In reality, legal reform created a quasi-random "natural experiment". Although the first criterion - the timing of father's death - is arguably uncorrelated with individual characteristics; the second criterion - the date of one's marriage - is potentially open to manipulation by individuals, either to evade or benefit from reform. However, regressions find no significant relationship between the year of father's death and daughters' marriage pre- vs. post-reform.⁹⁸

Gender-equalizing inheritance reforms were passed in different years in different states; I exploit this temporal variation in addition to comparisons of individuals across state borders to construct plausible counterfactuals. Using panel survey data for 8,569 households collected by the National Council of Applied Economic Research's Rural Economic and Demographic Survey (REDS), I identify comparison groups by

⁹⁶ The sex ratio is a standard measure of preferences for sons vs. daughters. Alternate measures such as the ratio of daughters to total children are inappropriate because the total number of children is endogenous to parents' sex preferences. Specifically, parents commonly use "fertility stopping rules" across India, whereby parents frequently continue having children (e.g. daughters) until they give birth to a son. (Bhalotra and Cochrane 2010) Bhalotra and Cochrane (2010) employ the most appropriate measure: the probability of a daughter's birth, conditional on a particular fertility history (depending on birth order and the composition of prior births). Unfortunately the subsample of reformer states surveyed in REDS most recent round does not provide adequate numbers of observations to utilize this measure. Later sections discuss the robustness of these results to use of the measures and dataset employed by Bhalotra and Cochrane (2010) (NFHS panel data).

⁹⁷ Legislators limited daughters' legal eligibility in response to the custom of dowry: already-married women were excluded from reform on the grounds that they had "already received" their share of property as dowry (Government of India 2005). Altogether, there are four conditions for legal eligibility: the death of one's father after reform's implementation, the absence of a will specifying ancestral property's distribution, the absence of ancestral property's partition, and marriage after reform's implementation. These criteria are discussed at length in the Empirical Methodology & Analysis section.

⁹⁸ Results are available upon request.

leveraging the geography of state boundaries to identify individuals from geographically- and culturally-similar districts where reform's year of implementation varies due to individuals' location on a given side of state boundaries (Figure 1).

[Figure 1 about here.]

People in border districts of south India's linguistically-determined states share not only a common geography, climate, languages, and social traditions, but also have common experiences of history, having been a part of common administrative entities for more than two centuries.⁹⁹ I analyze individuals in eleven districts at the tri-state border. I exploit reform's differential timing in the three neighboring states with a common border, pictured in Figure 1.¹⁰⁰ I also examine these results' robustness to two alternative specifications: first, inclusion of the complete set of households in reformer and non-reformer states. These two samples illustrate the tradeoff between sample size and comparison groups' quality. While the second sample allows for comparison of a much larger group of treated and untreated women, it cannot provide as well-specified a test of reform's causal impact as the first sample, due to the larger groups' conflation of individual treatment status with a given state's propensity to reform. Second, I examine the results' robustness to measurement of eligibility for reform based on grandfathers' date of death. This specification ensures that all land of the deceased is ancestral, and hence eligible for inheritance reform.¹⁰¹ This specification should not alter results significantly, since prior research identifies 98 percent of land owned in contemporary rural India as ancestral (Roy 2012).

Qualitative analysis of the mechanisms behind intra-household resistance to reform is based mainly on focus group interviews women and their husbands, and is supplemented by individual interviews with local officials, national policy-makers,

⁹⁹ This strategy approximates work by Ban, Jha, and Rao (2012) but is unable to match the precision of their selection strategy. Whereas they focus on pairs of administrative "mistakes" which now span two states, I select a contiguous set of districts at the borders of three states.

¹⁰⁰ NT Rama Rao's Telugu Desam Party initially implemented the Hindu Succession Act Amendment in Andhra Pradesh as of 1986, followed in 1989 by the Dravida Munnetra Kazhagam under Muthuvel Karunanidhi in Tamil Nadu, and subsequently, in 1994, by the Indian National Congress led by M. Veerappa Moily in Karnataka and led by Sharad Pawar in Maharashtra.

¹⁰¹ By definition, all land which passes through two generations of a given family (from grandfather to father, and father to child) is ancestral land. On this, see Desai 2010.

academics and lawyers. Overall, respondents emphasize the necessity of land inheritance as leverage to convince and reward sons for care of elder parents. “I will give to sons only because I will stay with sons only” was a common refrain which emphasized the implausibility of daughters’ inheritance in the context of patrilineal norms of family obligations and identity.

Interviews occurred in districts selected to represent the state’s diverse geography, culture and economy (Figure 2). Interview districts include isolated, hilly Srikakulam and Visakhapatnam districts in the Northern Coastal Andhra region; highly-connected and well-irrigated Krishna district in Central Coastal Andhra; the water-scarce Telangana region’s Naxal-affected Khammam district as well as the urban-fringe Ranga Reddy district; and water-scarce, politically-energetic Anantapur district in Ryalaseema.

[Figure 2 about here.]

A final set of empirical investigations use difference in differences analysis of NCAER’s REDS survey data to test the relationship between exposure to reform and gender-specific care of elder parents, as highlighted by qualitative research. Regressions find that where daughters are treated by reform, sons are indeed less likely to care for elder parents. On average, sons are nearly fifty percent less likely to care for parents in families where daughters have equal land inheritance rights, relative to families where daughters’ inheritance is unaffected by gender-equalizing land inheritance reform.

Overall, this paper provides the first individual-level identification of severe, unintended consequences resulting from India’s gender-equalizing land inheritance reform. The combination of reform and traditional marriage norms made daughters relatively more expensive. As a result, reform results in a significant drop in the reported sex ratio of daughters-to-sons born to eligible women, relative to ineligible women. Evidence also suggests two additional unintended consequences of the law: first, by diverting potential inheritance from sons, reform reduces sons’ willingness to care for elder parents. Second, reform increases the monetary dowry daughters receive

at the time of marriage, as parents attempt to substitute dowry payments for land inheritance. These findings highlight the dangers of attempting gender-equalizing reform in the face of India's contradictory social norms, particularly absent engagement with the household-level political economy of gender-specific investments that undergirds norms.

Assessing Reform's Unintended Consequences

By equalizing daughters' entitlements to one of the most valuable resources in rural India, ancestral land, the literature on "bargaining in the shadow of the law" suggests that India's gender-equalizing land inheritance reform can significantly increase women's value. If so, women exposed to inheritance reform should report increasingly equitable sex ratios (daughters-to-sons), relative to India's currently male-biased sex ratio of 917 girls born for every 1000 boys (Government of India 2011). However, if intra-household decision-making about inheritance is dominated by parents' strategic calculation of land transfers as targeted investments in future security or wealth, gender-equalizing inheritance reform may have significant unintended consequences by making daughters relatively more expensive investments while leaving the cost of sons unchanged. If parents' strategic logic structures responses to reform, mothers exposed to gender-equalizing reform should be less willing to have daughters relative to sons, reducing sex ratios. The bigger the expected cost increase in daughters, the more we would expect the reported ratio of daughters-to-sons to fall.

Difference in differences OLS regression analysis finds evidence of a significant, unintended consequence of gender-equalizing land inheritance reform on daughters' value, as proposed by the literature on parents' strategic bequests. Estimates of reform's inter-family impact using the sample of households at the tri-state border (Table 1) as well as across all states (Table 2) consistently report a negative impact of gender-equalizing reform on women's reported child sex ratio (daughters-to-sons). This impact is significant for the sample with the best-specified comparison groups (Table 1).

The paper proceeds by outlining the relevant data, quantitative strategies of assessing reform's direct impact, and findings. Its next section uses qualitative work to explain the importance of inheritance reform in light of parents' norm-based calculations of optimal strategies for ensuring their long-term security. The final empirical analysis examines reform's ability to alter patterns of daughters vs. sons' care for elder parents, as well as mothers' care for young daughters. Using both qualitative and empirical analysis, this paper is able to confirm and explain findings by a growing body work that outlines the potential for significant unintended consequences resulting from India's gender-equalizing land inheritance reform (Rosenblum 2013; Roy 2012).

Data

Following prior work on the HSAA, my primary data set is drawn from the National Council of Applied Economics (NCAER)'s Rural Economic and Demographic Survey (REDS).¹⁰² This nationally-representative panel survey covers 8,659 households from 240 villages in 17 states of rural India in its most recent 2006/8 round. In addition to the standard set of demographic questions, the survey records the respondent's reported number of sons and daughters born.

The dependent variable of interest is the is daughters' child sex ratio: the ratio of female to male children borne by a given woman, i , living in state s , born in year t : $\frac{Daughters_{ist}}{Sons_{ist}}$. This variable approaches 1 as women report giving birth to equal numbers of daughters and sons. Numbers less than one indicate a bias towards conceiving and raising sons, whereas numbers above one indicate a bias towards daughters. Across India, the current sex ratio is biased towards sons (.917). If reform increases daughters' value, the sex ratio of women exposed to, or eligible for reform should move closer towards one (equality).

¹⁰² Both Goyal et al. (2012) and Roy (2012) analyze data from NCAER's REDS. This paper follows Goyal et al. in using the most recent round of REDS with the most comprehensive questions on women's landholdings, from 2006/8.

The independent variable of interest, eligibility for legal reform, is based on the HSAA's conditions. Specifically, state amendments equalized rights to inherit ancestral land for Hindu women (80 percent of India's population)¹⁰³ who meet four conditions: their fathers pass away after the law's implementation, absent a will specifying the distribution of ancestral property and absent partition of the father's ancestral property, and who marry after the law's implementation (Desai 2010). Given that partition is nearly-always completed by inheritors after a fathers' death and will-writing remains an infrequent practice, there are two key conditions for eligibility: the timing of fathers' death and of daughters' marriage. I measure legal eligibility as a dummy variable, set to one if fathers pass away post reform and marriage occurs post-reform, and zero otherwise. In order to avoid bias induced by culture, wealth, or the experience of a fathers' death, I limit comparisons to the subset of siblings in Hindu, landholding families whose father has passed away prior to survey collection (2006/8).¹⁰⁴ However, in order to deal with additional sources of bias, I tightly construct comparison groups that create plausible counterfactuals regarding behavior in the absence of reform, as explained below.

A second dataset is drawn from qualitative interviews with rural women, their husbands, lawyers, activists, and local officials within land revenue departments, the judiciary, the police, panchayats, and other, locally-appointed bodies. These interviews were primarily conducted in the south Indian state of Andhra Pradesh, which pioneered inheritance reform. I selected six districts in which to conduct my interviews in order to represent the state's diverse geography, culture and economy. Districts include isolated, hilly Srikakulam and Visakhapatnam districts in the Northern Coastal Andhra region; highly-connected and well-irrigated Krishna district in Central Coastal Andhra; the water-scarce Telangana region's Naxal-affected Khammam district as well as the urban-fringe Ranga Reddy district; and water-scarce but politically-energetic Anantapur district in Ryalaseema region.

¹⁰³ India's personal, or religion-specific law, defines Hindu law as applicable to all individuals of Hindu, Buddhist, Sikh or Jain religions. For the sake of simplicity, I refer to this group of individuals by their legal status, e.g. as collectively "Hindu".

¹⁰⁴ Additionally, to avoid bias due to national, gender-equalizing inheritance reform in 2005, I limit the sample to siblings whose father passes away prior to 2005.

Villages were selected to represent varied access to information (high and low education levels) and levels of women's equality (relatively high and low ratios of women-to-men). Village selection was based on census data, such that villages were first stratified according to the criteria explained above, and then randomly selected within each stratum. Interviews occurred in subsets of the randomly selected villages, based on access generously provided by the Society for the Elimination of Rural Poverty (SERP). I also attempted to balance numbers of landless and landed women, educated and uneducated women, women from upper and Scheduled Castes, and members vs. non-members of village associations. Focus group interviews usually consisted of approximately 8 women, with a mix of closed and open-ended questions to gauge resource distribution and attitudes towards reform. Altogether, I conducted interviews in 48 villages, including small, focus-group or individual-level interviews with 692 individuals, and large group interviews with just over 500 individuals.¹⁰⁵ The following section begins by presenting quantitative strategies of analysis and findings, followed by the paper's qualitative analysis and its findings on gender-equalizing inheritance reform's unintended impact on daughters' value.

Empirical Strategy

The ideal measure of reform would assess the impact of random assignment into treatment groups, with gender-equal inheritance rights, and control groups, with the prior status quo of gender-unequal rights. Random assignment would create two comparable groups whose only significant difference is their legal inheritance rights. In this case, we could definitively isolate the causal impact of 'treatment' by inheritance reform. In reality, inheritance reform created a quasi-random "natural experiment," where women's inheritance rights were determined by a combination of both nearly-random and potentially non-random factors. I assume that eligibility criteria for gender-equal inheritance rights such as the marriage date can be

¹⁰⁵ Large group interviews range from 35-100 people, and represent the early portions of fieldwork, mainly between 5-16 April, 2010, when I was still working to formulate appropriate coordination and communication strategies in gathering *small* focus groups.

manipulated, whereas the date of fathers' death is indeed random. To account for potential manipulation of partition and marriage dates, I select comparison groups that are highly unlikely to be biased by manipulation.¹⁰⁶

With regard to fathers' potential 'legal' manipulation of daughters' eligibility via writing wills, the paucity of data on this phenomenon make it difficult to measure. A significant practice of will writing would bias estimates of legal impact downward, towards a null effect. Thus, this investigation can be viewed as a hard test for legal impact – any measured effect is unlikely to capture the full magnitude of legal impact.

One might expect will writing to be extremely popular post-reform amongst families disinclined to give daughters inheritance rights. However, fieldwork suggests that written wills are extremely rare. This is due, in part, to the enormous cost of engaging corrupt intermediaries in order to utilize the legal system. Engaging with legal institutions requires not only the creation of a legal will but also creation of formal rights to ancestral land. Such land is most frequently passed informally from one generation to the next, creating an informal web of rights that spans generations, spread across and possibly beyond India. This combination of logistical challenges and private interests in exploiting the informality of titles to ancestral land makes the process of formalizing inheritance rights extremely costly.

In addition, the social stigma of using an alien institution – courts – to resolve traditional familial concerns precludes many families from writing wills. In contrast, the practice of making *sada beinama*: oral contracts formalized in the presence of village elders, is popular in Andhra Pradesh. However, use of these informal contracts in court is complex and highly contested. In sum, despite resistance to reform, the

¹⁰⁶ Partition post-reform may not be random if male inheritors pre-date partitions such that they appear to occur pre-reform. Fraudulent partitions should become increasingly-difficult to enact beyond the first year of reform's implementation. To exclude such manipulation, the smallest window of time in which the paper examines reform's impact is in the five around reform. Marriage post-reform is potentially non-random if reform was expected to be significant and implementation's timing was well-known in advance. If so, parents with daughters of marital age wishing to evade the law could arrange daughters' marriages pre-reform. To avoid treatment bias due to strategically-timed marriages, this paper limits "treatment" and "control" groups to the most comparable individuals and families possible.

practice of formal will writing appears infrequent enough to introduce at most a minor downward bias on estimates of legal impact.

In order to create comparable groups of women that approximate the balanced sets of individuals that would result from random assignment to treatment and control groups, this paper utilizes geographic boundaries.¹⁰⁷ Once I have constructed appropriate comparison groups, I use difference in differences OLS regression analysis, comparing the equality of land inheritance amongst daughters with fathers who died before and after reform across groups of women who marry before and after reform. The difference in differences estimate can be interpreted as the causal impact of legal reform, under the assumption that daughters in treatment vs. control groups would arguably be subject to similar constraints determining inheritance distribution absent reform. In regressions, the control group consists of daughters with fathers' deaths and/or marriages prior to reform.¹⁰⁸ The descriptive statistics presented in Figures 3-5 suggest this assumption is valid. Standard errors are clustered at the village level, which was the unit at which survey teams operated.

State fixed effects are included to control for persistent differences across states. Time fixed effects, based on a given daughter's year of birth, are used to control for regional time trends in the distribution of inheritance to daughters. Control variables are based on the characteristics that vary significantly according to the descriptive statistics. These variables include indicators of daughters' years of schooling, caste status, the level of monetary dowry paid by a daughter's family to her husband's family upon marriage, and the number of daughters in a given family. The remainder of this section explains each strategy of creating appropriate comparison groups and describes the results of OLS regression analysis for each comparison group.

¹⁰⁷ A second strategy, leveraging groups ineligible for reform based on their landholding status as a placebo group, yields the same results as the two major strategies for constructing comparison groups. Results are available upon request.

¹⁰⁸ Analysis follows Goyal et al., Roy, and Rosenblum in using difference in difference estimations.

Geographically-based Comparison Groups

The geography of state boundaries provides an ideal method for constructing a sample of individuals from geographically- and culturally-similar districts with different timing of reform's implementation. The 1956 demarcation of territory once contained in the British Colonial provinces of Bombay, Madras, Coorg and Cochin as well as in the Princely states of Mysore and Hyderabad into linguistically-based states was particularly messy along the multi-lingual, multi-cultural borders of the resultant South Indian states, as explained by Radu Ban and his co-authors (Ban, Jha, and Rao 2012, 7-10). As a result of the messiness of state formation at these border zones, the population residing in border districts shares not only a common geography, climate, languages and social traditions associated with languages. They also have a common experience of history, having been a part of common administrative entities for over two centuries (Ibid).¹⁰⁹

The neighboring states of Andhra Pradesh, Tamil Nadu and Karnataka, whose territories intersect around Andhra Pradesh's southern and south-western borders (respectively), enacted inheritance reform in different years (1986, 1989 and 1994, respectively). Reform's differential timing is driven by the challenges of assembling political coalitions for reform, rather than by fundamentally different political, social or economic institutions. In each state, social reformers were able to build political consensus that gender-equalizing inheritance reform was an effective tool for capturing the increasingly-important female vote (Kohli 1994; Nelson 2011). Once elites observed reform's vote-garnering potential, reform's implementation hinged on the time-consuming process of assembling legislative coalitions. Reform's differential timing is thus best-understood as a reflection of the transmission time required to observe and replicate effective vote-garnering strategies by similar political parties across state borders.

¹⁰⁹ Radu Ban, Saumitra Jha and Vijayendra Rao provide a much tighter comparison of "mistakes" on the borders of modern South Indian states. Unfortunately, exact replication of their methodology is not possible with REDS data.

Comparing individuals in neighboring districts at the tri-state border creates a group of people from similar places whose exposure to inheritance rights depends solely on their placement relative to state borders. State borders' location is based primarily on the dominant linguistic group in a given region (Telegu speakers in Andhra Pradesh, Tamil in Tamil Nadu and Kanada in Karnataka). However, the groups at these regional borders share significant linguistic and cultural characters which make the placement of state borders essentially random as cultural markers.

The National Council of Applied Economics' Rural Economic and Demographic Survey (REDS) allows for comparison of eleven districts around the three states' borders: Chittoor and Anantpur in south western Andhra Pradesh; Chennai, Vellur and Kancheepuram districts in northern Tamil Nadu; and Raichur, Bellary, Bangalore, Bangalore-Rural, Chitradurga and Kolar districts in eastern and south-eastern Karnataka, as identified in Figure 1.

The descriptive statistics for families living at these state borders, presented in Figure 3 confirm that they do not differ significantly based on whether or not they are "treated" by reform.¹¹⁰ "Treated" and "untreated" daughters are born into families with statistically-similar characteristics, particularly in terms of the characteristics that are likely to drive their ability and interest in complying with inheritance law, including: mothers' and fathers' levels of education (according to years of schooling), number of children, and the acreage of land owned. Members of Scheduled Castes and Tribes are a minority in both groups. Additionally, families with fathers who die before and after reform do not differ significantly in their characteristics, with the exception of minor variation in their average number of children (Figure 4).

[Figures 3 and 4 about here.]

Overall, the descriptive statistics in Figures 3 and 4 confirm that the geography of state borders allows us to create a statistically-similar group of individuals 'treated' and 'untreated' by reform such that we can create a reasonable approximation of random assignment to treatment and control groups. This subset of REDS data provides one

¹¹⁰ "Treated" individuals are those who are eligible for gender-equal inheritance rights, e.g. women whose fathers die after inheritance reform and who marry after reform.

way to measure reform's impact independent of variation in culture, geography, and political and economic institutions.

Analysis

The analysis of inheritance reform's impact on sex ratios across families, for the sample of households living in districts at the tri-state border, calculates the following OLS regression:

$$\frac{Daughters_{ist}}{Sons_{ist}} = \beta_0 + \beta_1 Death_{ist} + \beta_2 Marriage_{ist} + \beta_3 Death * Marriage_i \quad (1)$$

$$\sum_s State\ Effects_s + \sum_t Time\ Effects_t + \gamma Controls_{ist} + \varepsilon_{ist}$$

As explained in the data section, the dependent variable is the reported ratio of daughters-to-sons born, for a given woman i , from natal household, h , living in state s , and born in year t . Numbers less than one indicate a son-skewed sex ratio, and numbers greater than one indicate a daughter-skewed sex ratio. The coefficient of interest is β_3 , which measures the effects of eligibility for gender-equal inheritance rights on a given daughter's child sex ratio.¹¹¹

[Table 1 about here.]

The results presented in Table 1 suggest that reform induced a significant decrease in the sex ratio. Column 1 reports a simplified estimate of reform's impact on daughters' ratio of female to male children, which is positive and significant at the 90 percent confidence level. This finding is shown to allow comparison with prior papers evaluating inheritance reform's impact via this simple, yet unfortunately inaccurate measure of treatment reform as based solely on the timing of a father's death.¹¹² The direction of inheritance reform's impact changes upon better-specification. Column 2 shows the impact of reform according to legal specifications. In this case, reform's impact is insignificant and negative. Once the sample is reduced to the subset of

¹¹¹ Note that daughters' child sex ratio is based on reports by the head of the household interviewed in a given survey. As a result, it is most likely that the number of daughters and sons reported reflects the numbers of surviving children, rather than the total number of daughters and sons to which the woman gave birth.

¹¹² In particular, see Goyal et al. 2012.

women whose fathers pass away within five years of reform, in Columns 3-7, the impact of inheritance reform is negative and statistically significant in all but one case. The one exception is Column 6, which finds a negative but insignificant impact of reform when including time fixed effects but excluding state fixed effects. However, Column 7 reports that reform's impact is negative and significant when including both state and time fixed effects.

Overall, Table 1's findings indicate that inheritance reform's indirect impact on women's child sex ratio is negative and statistically-significant. This provides provisional evidence of significant, unintended consequences resulting from inheritance reform: mothers report giving birth to fewer daughters versus sons when they gain equal inheritance rights. These results support the causal hypothesis that parents are more likely to view daughters as a potential threat to their long-term security following mother's exposure to reform.

Robustness Tests

Sample Re-specification

In order to test the robustness of Table 1's findings to inclusion of a larger sample of cases, Table 2 includes the complete set of households in reformer and non-reformer states. While this sample allows for comparison of a much larger group of treated and untreated women, it cannot provide as well-specified a test of reform's causal impact as the first sample, due to the larger groups' conflation of individual treatment status with a given state's propensity to reform. Given that a given state's propensity to implement gender-equalizing reform is likely an indicator of women's relatively higher status, it is unsurprising to find significant differences between multiple indicators of women's status for the subset of 'treated' women when compared to non-treated women across all Indian states for which REDS collects data (Figure 5). As a result, we should expect the significance of reform's impact to be reduced by the inclusion of all states.

[Figure 5 and Table 2 about here.]

Indeed, the coefficients for reform are in the same direction as Table 1, but their statistical significance disappears in Table 2. These findings suggest reform's impact is indeed negative, but is only identified within the sample of states where reform's timing is exogenous to states' propensity to adopt gender-equalizing legal reforms.

Data Re-specification

To check the representativeness of the daughters studied in the sample of districts bordering Andhra Pradesh, Karnataka and Tamil Nadu, Figure 6 compares the characteristics of families in the primary dataset used, the Rural Economic and Demographic Survey (REDS), gathered by the National Council of Applied Economic Research (NCAER) in 2006/8, with an alternate dataset: the India Human Development Survey, gathered by NCAER and the University of Maryland in 2005. The India Human Development Survey 2005 (IHDS) is a nationally representative survey of 41,554 households in 1503 villages and 971 urban neighborhoods across India. Two one-hour interviews in each household covered health, education, employment, economic status, marriage, fertility, gender relations, and social capital.

[Figure 6 about here.]

The IHDS provides a good check for the sub-sample's representativeness as it surveys a much larger set of women in rural regions of the tri-state border districts than REDS: the comparable samples of women surveyed are 7801 and 750, respectively. The basic descriptive statistics for comparable questions, presented in Figure 6, show most of the key characteristics to be similar across the IHDS and REDS samples: similar proportions of daughters receive education (66 versus 70 percent, respectively), as well as fathers (64 versus 51 percent, respectively) and sons (66 versus 82 percent). Numbers of children in surveyed households are reasonably similar (2.4 versus 3, respectively). At the village level, there are similar proportions of "Hindu" populations subject to reforms of Hindu personal law (80 versus 86 percent) and similar proportions of traditionally disadvantaged Scheduled Castes (19 percent in both cases).

The differences between the IHDS and REDS samples are largest in the case of the proportion of mothers receiving an education (65 versus 35 percent, respectively). However, given that the proportions of daughters receiving an education are nearly equal (66 versus 70 percent), it is unlikely that differences in mothers' education levels bias their willingness to educate and support daughters. Overall, comparison of REDS with the IHDS sample suggests that the REDS dataset provides a representative subsample of population of daughters in districts at the tri-state border.

Variable Re-specification

Complementary research on gender-equalizing inheritance reform by Sanchari Roy (2012) suggests that the grandfather's – rather than father's – death is the relevant measure of daughter's eligibility for equal inheritance rights. Measuring legal “treatment” based on grandfathers' death is a more precise measure because it ensures that all land owned by the deceased is indeed ancestral land subject to reform. In practice, measuring “treatment” based on father's death should yield similar results, as 98 percent of land owned in contemporary rural India is ancestral land (Roy 2012). However, to ensure that results are robust to the most precise specification of reform possible, the regressions presented in Table 3 substitute grandfather's death pre- versus post-reform for prior regressions' measure of father's death pre- versus post-reform. As in Tables 1 and 2, there is a negative coefficient on the interaction variable capturing treatment by reform, (grandfather's death post-reform * marriage post-reform, or “Reform applies”). This effect is statistically significant for the best-specified cases (columns 5 and 6). These results suggest that reform's impact is robust to more precise specification of legal treatment.

[Table 3 about here.]

Database & Variable Re-specification

To test the representativeness of these findings for sex selection across India, complementary work with Sonia Bhalotra and Sanchari Roy utilizes data for 0.5 million births and 0.2 million mothers from multiple rounds of the National Family

Health Survey, India. The identification strategy follows prior research by Bhalotra and Cochrane (2010): we exploit the randomness of first births to capture the impact of two time-specific changes – inheritance reform and the advent of ultrasound – on parents’ willingness to abort 2nd-born daughters.¹¹³

We examine the probability that a child is female, given birth post-reform and ultrasound availability – as a proxy for ability to conduct sex-selective abortions. Specifically, we examine reform and ultrasound availability’s impact for the subset of families most likely to abort daughters: those whose first child was a girl.¹¹⁴ Preliminary regressions results find that families with first-born daughters are significantly less likely to have daughters post-reform and post-ultrasound roll-out. Marginal effects are significant at the 99 percent confidence level, and decrease the likelihood that a given child will be female by two to four percent. Overall, the ongoing joint work confirms this paper’s main finding: reform has a significant, negative impact on parents’ willingness to give birth to daughters. Indeed, the results suggest that reform’s impact is accentuated by the availability of ultrasound across India.

Qualitative Sampling Method & Analysis

This section explores the causal mechanisms driving the key hypothesis proposed, namely that parents’ strategic investment of inheritance in sons as future caretakers motivates their resistance to inheritance reform. To understand the relationship between norms about land inheritance entitlements and parents’ response to legal change, this section investigates inheritance norms in contemporary India. It does so by presenting findings from qualitative fieldwork in six districts of Andhra Pradesh (Figure 2).

¹¹³ Bhalotra and Cochrane (2010) identify trends for the sex composition of first-born children as consistent across time and space, both before and after ultrasound’s advent in India. In other words, they find that parents are unwilling to abort their first child regardless of its sex.

¹¹⁴ This variable – the probability that the second-born child is female, conditional on the sex of the first born child – is the ideal measure of sex-selection. I am unable to use it with REDS data, as the number of observations is too few to disaggregate by the sex composition of first and second births.

Districts were selected to represent the range of local capacities to supply and demand legal enforcement – based on location near the state government’s center (Ranga Reddy) vs. periphery (Srikakulam and Visakhapatnam), as well as in resource-rich regions (Krishna) and resource-poor regions (Khammam and Ryalaseema), with various histories of support for vs. contestation of the state (Krishna vs. Khammam). This section focuses on interviews conducted primarily with rural agriculturalists, with secondary support from interviews with local and national political officials, lawyers, academics and activists. Specifically, this section analyzes the nature of contemporary inheritance norms and the household-level political economy that undergirds them in rural south India.

Interviews highlight one causal mechanism tying inheritance reform to aversion for daughters: the overwhelming importance of patrilineal inheritance as the lynchpin that ensures sons’ obligations to care for elder parents. In brief, sons’ inheritance is viewed as the major formal source of parents’ long-term security.¹¹⁵ Son’s importance for elder parents has normative, economic and legal roots, which are explained in detail below. The remainder of this section examines the plausibility of the hypothesis that parents rely on sons – and not daughters – for care in old age and explores the extent to which inheritance reform changes sons’ behavior.

The strong relationship between patrilineal land inheritance and sons’ care for elderly parents is visible in India’s formal legal structure, state welfare institutions, social expectations within Hindu families, and within the structure of the economic transactions between family members (Agarwal 1994, 1998; Caldwell, Reddy, and Caldwell 1982, 1988; Chen and Dreze 1992; Dharmalingam 1994).

Legally, each Hindu child who has a claim on their parent’s property is responsible for maintaining their parents.¹¹⁶ In contrast, the state is largely absent in the provision of care for elders (Rajan and Kumar 2003; Shah 1999, 1179). Instead of reliance on the state, elder parents across India depend primarily on children for housing and financial

¹¹⁵ Additionally, sons’ inheritance is perceived to be the major informal source of their sisters’ security. Sisters do not challenge the patrilineal system of inheritance in order to maintain their brothers’ good will, which is the major informal guarantee of their long-term security.

¹¹⁶ Section 22 of the Hindu Adoption and Maintenance Act, 1956, c.f. Rajan.

needs. According to India's National Health Family Survey of 1992/3, only 6 percent of elder parents in India live in a home where immediate kin are not present (Rajan and Kumar 2003, 80). This roughly conforms with patterns of care for elders across the rural developing world (Fafchamps and Quisumbing 2008).

Social norms dictate that sons care for elder parents, and parents explicitly link the distribution of land inheritance to sons' duty to care for them: "I will give land to my son only because he will take care of his parents" was a common refrain in interviews.¹¹⁷ In combination with strongly-held social norms, economic incentives become powerful facilitators of sons' compliance. Social norms are particularly binding where the presence of ancestral land gives sons the material means and incentives to care for parents. As described in rural Tamil Nadu:

"The usual practice is to divide the land among the sons when it becomes difficult for the old person to cultivate it, on the understanding (sometimes, on condition) that each son is obliged to give some amount of paddy and money to the parents on a monthly, yearly, or harvest basis. Though society expects that aged parents should be fed, clothed, sheltered, and looked after by their sons, the degree to which the economic needs of the elderly are met depends on the sons' economic situation. If there is no land to be divided among sons, the care rendered to aged parents is also limited" (Dharmalingam 1994, 10).

The importance of property as a negotiating tool is not lost on parents.¹¹⁸ The saying that "without property, children do not look after their parents well" is widely documented (Agarwal 1998; Caldwell, Reddy, and Caldwell 1988, 191). Given ancestral land's role as the most critical form of property in rural India, parents' distribution of it is their greatest source of bargaining power in ensuring children's care in their old age (Agarwal 1998). The distribution of these economic incentives is limited to sons due to a combination of patrilineal and patrilocal social norms. The resulting social system justifies the transfer of ancestral land exclusively from fathers to sons. In contrast, widows who survive their husbands but have no sons generally

¹¹⁷ Author's interview of 19 November, 2010, Focus Group Discussion. Rotarypuram Village, Anantapur District, Andhra Pradesh.

¹¹⁸ This point was made frequently by parents, who repeatedly emphasized the necessity of distributing land to ensure sons' care in old age during interviews with the author across Andhra Pradesh in 2010-2011.

lose control of ancestral land and associated property such as their home (Agarwal 1994, 1998; Chen and Dreze 1992; Rao 2008).

In sum, insights from field research are supported by existing ethnographic and economic analysis; descriptions of patrilineal inheritance norms consistently focus on its centrality within the household-level political economic of gender-specific investments in children. The next section explores the extent to which we observe sons' care for elder parents, as dictated by patrilineal norms, in panel survey data.

Assessing Inheritance Reform's Impact on Elder Parents' Care

This section returns to NCAER's 2006/2008 round of REDS to examine whether or not inheritance reform alters levels of respect for inheritance norms. Analysis finds that patrilineal inheritance – as an incentive for sons' care of elder parents – is a key component of parents' security in old age. Approximately 80 percent of elder parents live with their children, yet less than two percent live with married daughters' families (63 of 3,862).

There is suggestive evidence of inheritance reform's negative impact on sons' willingness to care for elder parents: Pre-reform, only sons in families with vs. without daughters are equally likely to care for elder parents. In families without daughters, reform does not alter the frequency with which only sons care for elder parents. However, in families with a son and daughter(s), sons are significantly less likely to care for parents post-reform vs. pre-reform. These findings provide evidence that ensuring *son's* respect for inheritance norms is a powerful motive for parental behavior. In light of this fact, reform's ability to alter son's respect for inheritance norms provides a plausible rationale for parental action to manipulate reform's ability to influence their families, and hence their long-term security.

Do Sons Care for Elder Parents?

In order to test the assumption that sons act as caretakers for elder parents, we can examine the percentage of male household heads in the REDS sample whose elder parents reside with them. This provides a basic test of the plausibility of the assumption that parents expect to spend old age in their sons' care.

Out of the 8,528 REDS households surveyed, 45 percent (3,862) have an elder parent living.¹¹⁹ Within the set of households with living elder parents, in 51 percent (1,982 of 3,862), elder parents reside with their married children. This confirms the plausibility of the assumption that parents rely on children for care – meaning physical support that includes housing – once they reach old age. In fact, this estimate should be taken as a lower bound because it only accounts for elder parents who reside in the household that was surveyed. In other words, this estimate does not account for elder parents of the surveyed household head who live with another child, specifically, a sibling of the surveyed household head with a separate household.

A more precise estimate of the proportion of children who care for elder parents can be found using the subset of households where living elder parents have only one child. In 81 percent of these households (94 of 116), elder parents live with their only child. This suggests that children are indeed the primary source of physical support for elder parents.

Do Daughters Care for Elder Parents Less than Sons?

How plausible is the assumption of parents' belief that sons –*and not daughters*– are imperative for ensuring their care in old age? This assumption is based on mainstream patrilineal norms which dictate that familial responsibility, including care for elders, travels from fathers to sons. In contrast, daughters' responsibilities to their natal family are severed when they marry. After marriage, daughters are exclusively

¹¹⁹ For the purposes of this analysis, parents are classified as "elders" if they are at least 60 years of age. Age is measured based on the reported year of birth. Given that 85 percent of households in NCAER's 2006/8 round of the Rural Economic and Demographic Survey (REDS) were surveyed in 2008, all parents born before 1949 are classified as elders.

responsible for ensuring the welfare of their husband and marital family. This follows the traditional idea of *kanyadan*, where daughters are considered as gifts given away at marriage to their husband and his family, such that nothing can be received from married daughters (Shah 1999, 1181). Whereas investments in sons are repaid in parents' old age, investing in daughters is "planting a seed in another's garden" (Rosenberg 2009).

To test the veracity of the claim that elder parents do not rely on daughters once they marry into other households, we examine the share of cases where elder parents live with their married daughters *in another family's (their husband's) household*.¹²⁰ As expected, this is an extremely rare phenomenon: elder parents live with married daughters who are spouses (rather than household heads) in less than two percent of households (63 of 3,862). Even for the subset of families where married daughters are only children, just over two percent (9 of 398) of elder parents live in the same household.¹²¹ Thus, parents with daughters are much more vulnerable in old age in the absence of sons vs. in the presence of sons. These patterns support the plausibility of the assumption that daughters, once they marry into other households, are almost never a source of support for elder parents.

The assumption underlying the expectation that *only sons* will provide for parents' long-term security is that marriage constrains daughters both physically and normatively from caring for parents. Married daughters might be geographically-constrained by the expectation that they move out of their natal home and into their husband's home, which they become obliged to manage. If husbands live in a village distant from daughters' birth, marriage makes it difficult for daughters to visit and care for parents who continue living in their natal home. In addition, married daughters might be normatively-constrained to follow their new household's rules about who

¹²⁰ For the purpose of this analysis, I code spouses of the household head as "daughters who marry into another household." Given that REDS provides information on the relationship and age of all household residents, these daughters are coded as housing their elder parents if the mother- or father-in-law of the household head resides in the household and was over 60 years of age in 2008.

¹²¹ The percentage of spouses who house their parents is calculated as a portion of the group of families with some elder relative alive, regardless of whether they are a blood relative of the household head or spouse.

will be included and excluded from the household. Traditionally, this excludes the daughters' natal parents.

To test the importance of these geographical and normative constraints on marital daughters, we can compare patterns of elder care between two different subsets of daughters: (1) those who are bound by these constraints – the spouses studied above – and (2) those for whom constraints are not binding either geographically because they live in the same village as their natal family, or normatively because they either remain in their parents' household post-marriage, marry a relative, or they become the heads of their marital household and thus have the power to include their natal parents in the household. The majority of these married women became household heads as widows (73 percent: 672 of 919).¹²²

Let us first examine the group of married daughters without geographic constraints. Daughters have the same marital and natal village in 7 percent of households with living elder parents (259 of 3,862). For *spouses* of the household head from the same village, three percent of elder parents live in the household (3 of 108). This roughly matches the percentage of elder parents living with the larger subset of daughters (2%). Thus, geographic constraints are not the key factor restricting daughters' care for elders.

Let us now consider the group of married daughters with fewer normative constraints. Normative constraints on daughters' care for parents should not apply to daughters who remain with parents after marriage. Overall, children remain in parents' household after marriage in 37 percent of households with living elder parents (1,425 of 3,862). Married daughters are present in five percent of these households (76 of 1,425). Elder parents reside with married daughters in 80 percent of these households (61 of 76). While it is rare for daughters to remain in parents' household after marriage, this reversal of tradition allows daughters to care for elder parents.

Normative constraints should also be loosened if daughters marry a relative. As Agarwal explains (1994), cross-cousin marriage allows for more supportive

¹²² The remaining quarter of married women became household heads after older household members migrated elsewhere. These women's husbands are still alive and well.

relationships between parents and married daughters and is frequent in South India. In nine percent of households, living elder parents' children marry a relative (330 of 3,862). Yet this prior relationship between married daughters and their husband's parents does not alter the likelihood that daughters will care for elder parents. Two percent of daughters who marry into a relative's family care for elder parents (8 of 330), which is the same percentage as daughters who marry into an unrelated family (50 of 2,330).¹²³

Finally, normative constraints should be less binding if married daughters are the heads of their own households and hence able to decide whether or not to invite elder parents into their home.¹²⁴ Married daughters are heads in four percent of households with living elder parents (141 of 3,862). In 27 percent of these households, elder parents live with married daughters (38 of 141). Whether or not the two families were related before marriage does not significantly alter the percentage of elder parents living in daughter-headed households.¹²⁵ These descriptive statistics suggest that the primary constraint on daughters' ability to care for elder parents is normative, based on daughters' marriage out of their natal family and into their husband's family.

Are daughters who avoid both geographic and normative constraints more likely to house elder parents? In the subset of daughter-headed households located in daughters' natal village, 36 percent of elder parents live with their daughters (34 of 95). Thus, the subset of daughters who are least constrained by both geographic and normative constraints are most likely to care for elder parents. This is clearly a much larger percentage of elder parents living with daughters than average, but is still significantly below the percentage of elder parents living with sons. In sum, the overwhelming majority of daughters are unable to care for parents due to the normative constraints of Indian society. Sons' importance as guarantors of elder parents' care is understandable

¹²³ Here daughters are analyzed as spouses. Find analysis of daughters as household heads in the next paragraph.

¹²⁴ To repeat, married daughters mainly become household heads upon the death of their husband.

¹²⁵ Where families were related before marriage, 24 percent of elder parents live in households headed by their daughters (5 of 21). Where families were unrelated, 28 percent of elder parents live in daughter-headed households (33 of 120).

in light of the tiny proportion of households in which daughters are both physically- and normatively-able to care for parents (two percent, or 95 of 3,862).¹²⁶

Do Sons Care Less for Elder Parents after Inheritance Reform?

Does inheritance reform alter children's willingness to care for elder parents? The causal hypothesis proposed is that parents worry about reform's impact on son's willingness to care for them *when they have daughters who can compete with their sons for inheritance*. If so, the real difference in care for elder parents should emerge when comparing reform's impact on son's care for elder parents in families with daughters vs. in families without daughters.

If inheritance reform reduces sons' incentives, the number of sons who care for elder parents should drop significantly post-reform in families *with daughters vs. without daughters*, all else equal.¹²⁷ In order to isolate changes in sons' behavior caused by the presence of daughters, let us focus on families with only one son. The subset of families in reform states with only one son constitutes five percent of the total sample with living elder parents (178 of 3,862 households).

Does reform significantly decrease the frequency of only sons' care for elder parents dependent on daughters' presence? In families with one married son and at least one daughter, 80 percent of sons care for elder parents (71 of 89) if the prior household head passed away pre-reform. 76 percent of sons care for elder parents if the prior head passed away post-reform (35 of 46). This difference is statistically insignificant. In families with only one son and no daughters, 77 percent of sons care for elder parents if the prior head passed away pre-reform (20 of 26), whereas 100 percent of sons care for elder parents when the prior head passed away post-reform (13 of 13). These descriptive statistics lend credence to the hypothesis that reform makes only sons *with sisters* less likely to care for elder parents, relative to only sons *without*

¹²⁶ The proportion of households where daughters evade geographic and normative grows to 4 percent (151 of 3,862) if one includes the 56 married daughters who reside with elder parents.

¹²⁷ Unfortunately, we cannot measure sons' behavior absent any changes in family dynamics that are correlated with reform, such as parents' distribution of non-inheritance incentives to children. Thus, we can only approximate reform's impact on son's behavior in families with vs. without daughters net all reform-induced changes in family dynamics.

sisters. Yet this pattern may be biased by a large number of married sons who are simply living at home with elder parents until they can begin independent households. The small number of households without daughters and a prior head who passed away post-reform makes bias a serious concern.

If we consider the smaller yet most comparable subset of households – those headed by only sons (82) – reform remains strongly correlated with a decreased likelihood of sons' care for elder parents where daughters are present. Regardless of whether families have daughters or not, when the head passed away prior to reform, sons care for the surviving elder parent at similar rates (45-51). However, daughters' presence makes a difference in families whose head passed away post-reform: in families without daughters, 100 percent (6) of only sons house their surviving, elder parent. In families with a son *and* daughters, only 61 percent of only sons (17 of 28) house their elder parent. The small number of observations makes inference from this data suggestive at best. However, this data does indicate that sons in families without daughters are significantly more likely to house parents post- vs. pre-reform, relative to sons in families with daughters.

Difference in difference analysis of reform's impact on sons' care for elder parents runs regressions that use the following equation:

$$\begin{aligned} \text{Sons' Care}_{hst} = & \beta_0 + \beta_1 \text{Reform Applies}_{hst} + \beta_2 \text{Any Daughters}_{hst} \\ & + \beta_3 \text{Reform Applies}_{hst} * \text{Any Daughters}_{hst} + \gamma \text{Controls}_{hst} + \varepsilon_{hst} \end{aligned} \quad (4)$$

where the dependent variable of interest is whether or not sons care for their surviving elder parents, for a given household h , in state s whose current head is born in year t . Analysis uses the subset of households residing in the four states who pioneered reform with surviving elder parents (usually, the elder mother), only one son, and a recorded date of death for the prior head (usually, the elder father). Equation 4 includes three household-level indicator variables. *Reform Applies*_{hst} is set to one if a given household has a prior head who passes away after reform and zero otherwise. This is a simplistic measure of reform, which is used because it captures the only dimension of legal eligibility relevant for families without daughters.

$Any\ Daughters_{hst}$ is an indicator of whether or not the family includes any daughters. The interaction of the prior two variables, $Reform\ Applies_{hst} * Any\ Daughters_{hst}$ is set to one for households whose prior head passed away after reform with at least one daughter, and is zero otherwise. β_3 is the coefficient of interest, which captures the effect of daughters' presence on the frequency with which sons care for elder parents post- vs. pre-inheritance reform.

Table 4 displays the results of difference in difference regressions. They suggest that parents' concerns about reform's ability to dissuade sons from supporting them in their old age *when daughters are present to claim inheritance rights* are well-founded. The interaction of exposure to reform and daughters' presence, $Reform\ Applies_{hst} * Any\ Daughters_{hst}$, is correlated with a significant drop in the frequency with which only sons care for elder parents for the full sample (Column 2), and is robust to controls for family characteristics (parental land and the number of siblings, Column 3) as well as to inclusion of state fixed effects to account for regional trends in sons' willingness to care for elder parents (Column 5). The one exception is Column 4, where time fixed effects are included. In this case, the interaction of exposure to reform and daughters' presence is still negatively correlated with sons' care, but becomes statistically insignificant. This result may simply be a reflection of the small sample size (n=82). Indeed, analysis of the larger sample of similar families from all states finds that the interaction of exposure to reform and daughters' presence is a negative, statistically-significant predictor of sons' care for all specifications (Table 5).

[Tables 4 and 5 about here.]

Parents' concerns about a reform-induced drop in sons' care could be allayed if reform also convinces daughters to care for elder parents. All else equal, reform should also improve daughters' incentives to care for elder parents if they expect to inherit land. For women who marry into another household where they are not the head, their care of elder parents does not increase following reform. However, only 2 percent of spouses house elder parents in households where the prior head died pre-reform (2 of 129) versus none in households where the prior head died post-reform (0 of 63).

Regarding the tiny group of women who evade normative constraints – either as household heads or married daughters in their parents’ household – they are indeed more likely to care for elder parents.¹²⁸

In sum, inheritance reform has the potential to increase daughters’ care for elder parents where daughters evade normative constraints. However, reform’s potential is practically irrelevant in the REDS population under study, where only five percent of married women (12 of 262) can act independently of normative constraints. Additionally, reform does not significantly change these women’s material incentives to care for parents: no one had inherited land as of the survey’s completion.

Overall, this section’s findings indicate that parents primarily rely on children for support in old age. Parents rely nearly-exclusively on sons; only two percent of elder parents rely on daughters. Patterns of sons’ care support the rationality of concerns about reform’s ability to dissuade sons from caring for elders when daughters may claim equal shares of ancestral property. In families where the prior head passes away after vs. before reform, sons with sisters are less likely to care for elder parents relative to sons without sisters. Such patterns suggest that parents may see daughters as threats to sons’ future capacity and commitment to care for elder parents. This provides one explanation as to why gender-equalizing land inheritance reform women may generate perverse incentives that lower daughters’ value, and subsequently lower reported sex ratios of daughters-to-sons born.

Assessing Inheritance Reform’s Impact on Daughters’ Care

The paper’s final analytic section investigates the nature of gender-equalizing inheritance reform’s impact on child sex ratios. It examines whether inheritance reform alters the sex ratio either by changing sex-specific parental investment in children – vis-à-vis child polio vaccination rates – and/or by influencing sex-specific

¹²⁸ Out of the 12 married women in early-reform states who head their own household or live in their parents’ household, 4 of 8 care for elders if the prior head passed away pre-reform, vs. 3 of 4 if the head passed away post-reform.

child survival rates. Difference in difference regression analysis supports the second scenario: reform is significantly associated with a decline in daughters' survival rates.

Sex & Survival Rates

What explains the relationship between gender-equalizing inheritance reform and the reduced ratio of daughters-to-sons who survive childhood? The lower ratio of daughters-to-sons may indicate one of three scenarios: an increase of female infanticide via sex-selective abortion, an increase in female infanticide immediately following childbirth, or a decrease in the care provided to girls such that fewer daughters survive infancy. Data on the illegal practice of sex-selective abortion is difficult to access. As a result, we restrict analysis to examination of the second and third cases' plausibility. We examine variation in two variables included in NCAER's 2006/8 round of REDS: sex-specific rates of child survival and family-specific rates of child polio vaccination. Difference in difference regression analysis lends relatively more support to the second scenario: an increase in female infanticide after childbirth. We conclude with a brief discussion of the first vs. second scenario's plausibility with reference to complimentary survey analysis conducted by Jha et al. (2011) and Rosenblum (2013).

This section's analysis considers three hypotheses. First, if inheritance reform diminishes the ratio of daughters-to-sons via female infanticide post-childbirth, women should report lower survival rates amongst daughters born post vs. pre-reform, relative to sons born post vs. pre-reform. Second, if inheritance reform alters the ratio of daughters-to-sons by reducing parents' incentives to care for young girls, this should be observable in the frequency with which parents vaccinate daughters against polio post- vs. pre-reform, relative to sons. Third, in the absence of reliable sub-national data on abortion rates, we examine the likelihood of sex-selective abortion by ruling out other possibilities: if abortion *pre-childbirth* diminishes the ratio of daughters-to-sons, reform should not be correlated with sex-specific variation around reform in either child polio vaccination rates or child survival rates. We conclude by

assessing the plausibility of each hypothesis in explaining inheritance reform's impact on child sex ratios.

Inheritance Reform & Female Infanticide Post-Child Birth

The percentage of children who survive childbirth can be gauged based on the difference between mothers' reported number of children to whom they gave birth versus the reported number of living children. This is admittedly a crude measure of child survival rates, given that the number of living children is calculated by REDS in 2006/8 rather than in the first year of a child's birth. Clearly, this measure captures a wider breadth of sources of child mortality than simply infant mortality. However, in India, child mortality (death before age five) is primarily a measure of infant mortality (death before age one): nationally, nearly 75 percent of child deaths occur in infancy (Pandey et al. 1998, 27-32).

To provide a baseline for evaluating reform's impact on child survival: mothers report an average child survival rate of 96 percent for children born in the period spanning one decade pre-reform and one decade post-reform (1975/6-2004/5) across the four early-reforming states (Andhra Pradesh, Karnataka, Maharashtra and Tamil Nadu). This REDS figure is slightly higher than the National Health and Family Survey's (NFHS's) estimates (Pandey et al. 1998).¹²⁹ REDS' estimates of child survival rates appear to be particularly inflated for daughters from this subset of families, whose survival rates nearly equal sons' rates (95.6 versus 96.3 percent, respectively). In contrast, the NHFS estimates female survival rates to be 3 percent lower than males' in infancy, and 40 percent lower than males' in childhood overall (Pandey et al. 1998, 37). Thus, REDS is likely to be a particularly crude measure of reform's impact on daughters' childhood survival rates relative to sons'. As a result, we should expect estimates of reform's impact on child survival rates to be lower bounds at best.

¹²⁹ NFHS estimates infant's average survival rate is 93 percent across the four states in 1986-1998 (Pandey et al. 1998, 30). Additionally, NHFS estimates of average survival rates for children under five years in early reformers during 1986-1998 are significantly lower: 90.4 percent. It is likely that mothers are under-reporting children's mortality in REDS, leading to inflated rates of child survival.

Is inheritance reform associated with increasing female infanticide post-childbirth? If so, mothers should report declining survival rates for daughters post- vs. pre-reform, relative to sons. Analysis is based on the subset of households where mothers report giving birth to both sons and daughters, and mothers for whom the father's date of death is listed. Two measures of reform are analyzed, both calculated at the household level.¹³⁰ The first measure codes families as "treated" by reform if the most recent child is born after reform and "untreated" otherwise. In this case, the independent variable of interest – whether or not the families' most recent child was born after reform – measures reform's marginal impact on parental behavior.

Second, we measure reform following the bulk of prior regression analysis, according to mothers' status as 'treated' or 'untreated' based on legal eligibility (i.e. if marriage and fathers' death occur post-reform). Descriptive analysis using the first measure of reform finds an insignificant relationship between reform and sex-specific child survival rates. However, difference in difference analysis based on the second measure of reform – mothers' legal eligibility – finds a significant, positive relationship between inheritance reform and female infanticide post-childbirth.

Descriptive analysis of reform based on the date of families' latest child's birth reveals little variation in levels of female infanticide post-childbirth pre- vs. post-reform. In families with all children born pre-reform, daughters have survival rates that are 2.4 percent lower than sons'. In contrast, daughters' survival rates are 1.9 percent lower than sons' in families with children born post-reform. The gap between daughters' vs. sons' survival rates shrinks rather than grows post reform, with a statistically insignificant rate of change.¹³¹

The analysis of inheritance reform's impact based on mother's legal eligibility relies on difference in difference regressions which use the following equation:

$$\left(\frac{\text{surviving daughters}}{\text{Total daughters born}} - \frac{\text{surviving sons}}{\text{Total sons born}} \right)_{mst} = \beta_0 + \beta_1 \text{Death}_{mst} + \beta_2 \text{Marriage}_{mst} +$$

¹³⁰ Children's treatment status is coded using families as the unit of analysis because REDS reports both dependent variables of interest – child vaccination and child survival rates – at the household level only.

¹³¹ The difference in difference coefficient -the difference between sons' and daughters' survival rates based on birth post- vs. pre-reform- is 0.0054 with a standard error of 0.0119 and a t-statistic of 0.455.

$$\beta_3 \text{Death}_{mst} * \text{Marriage}_{mst} + \sum_s \text{State Effects}_s + \sum_t \text{Time Effects}_t + \gamma \text{Controls}_{mst} + \varepsilon_m \quad (5)$$

where the dependent variable is the relative survival rate of daughters relative to sons for a given mother m , who is born in year t and living in state s . Equation 8 includes three indicator variables. Death_{mst} is set to one if a given mother in state s born in year t has a father who passes away post-reform, and is zero otherwise. Marriage_{mst} is set to one if a given mother in state s born in year t marries post-reform, and is zero otherwise. The interaction of the two indicators, $\text{Death}_{mst} * \text{Marriage}_{mst}$ is set to one when a given mother in state s born in year t has a father who passes away after reform and marries post-reform, and zero otherwise. A mother meets the prerequisites for legal eligibility if $\text{Death}_{mst} * \text{Marriage}_{mst} = 1$. As such, β_3 is the coefficient of interest, which measures the effect of eligibility for gender-equal inheritance rights on the survival rate of a given mother's daughters relative to her sons. Control variables are based on the characteristics which have been shown to influence sex-specific child survival rates: mothers' education (years of schooling) and wealth, using the proxy of landholding status (Jha et al. 2011).

The results, presented in Table 6, show that mothers' treatment by reform has a consistent, negative impact on daughters' relative survival rate. Reform's impact appears insignificant without accounting for time trends (Columns 1-3). However, once time trends based on fixed effects for mothers' year of birth are included, reform has a statistically significant, negative impact on daughters' relative survival rate. This follows prior work which estimates a significant, increasing time trend for female infanticide over the past three decades (Bhalotra and Cochrane 2010; Pandey et al. 1998). The significance of reform's negative impact increases once state-specific trends are included, again reflecting the existing consensus that female infanticide varies dramatically across states (Ibid). The direction of these results holds for analysis of the full sample of reformer and non-reformer states (Table 7). However the significance of exposure to reform disappears in Table 7. As mentioned in Table 2's discussion, these findings suggest that reform's impact on daughters' relative survival rates is negative, but can only be identified within the sample of states where reform's timing is exogenous to states' propensity to adopt gender-equalizing legal reforms.

[Tables 6 and 7 about here.]

Despite the inflated rates of daughters' survival rates reported by mothers in REDS, it appears that daughters' chances of survival post-childbirth diminish in comparison to sons', for children born to mothers treated by inheritance reform relative to children of untreated mothers.

Sex-Specific Parental Investment: Child Polio Vaccination

If reform induces parents to alter investments in daughters' health, this should be visible via lower rates of polio vaccination for daughters post- vs. pre-reform, relative to sons. We use polio vaccination to measure of Hindu parents' sex-specific investment in children because it should be relatively-independent of state-specific policies and resources: national polio campaigns predate inheritance reform and have largely been catalyzed and funded by international organizations acting under the World Health Organization's guidance.¹³² NCAER's REDS 2006/8 round asks mothers whether or not their children have been vaccinated against polio. This allows for household-level, but not child-level, measures of polio vaccination. As in the prior section, we assess reform's impact using two methods: first, whether or not all children are born before reform and second, mothers' legal eligibility for inheritance rights.

As a benchmark for comparisons of parental investment: amongst children born after 2000, 93 percent of mothers report having vaccinated their children against polio (2,791 of 3,000). For children born within ten years of state-level inheritance reforms – that is between 1975/6 and 2004/5 – 86 percent of mothers report their children as immunized versus polio (1,313 of 1,529). Since REDS does not ask about child-

¹³² In India, systematic child immunization against polio started as of the Expanded Program of Immunization (EPI) of 1978, following the World Health Organization's 1974 EPI campaign. As of 1985, the Universal Immunization Program increased immunization's scope in line with WHO guidelines. In 1995 the Pulse Polio Immunization Program raised immunization targets, with the aim of 100 percent child immunization as per the World Health Organization's 1988 Polio Eradication Initiative. In addition to the WHO, other partners include the Rotary Club, UNICEF, and the Bill and Melinda Gates Foundation. Source: Walsh, "How India Has Had Remarkable Success in Polio Fight," *BBC*, 2012. For more details, see the Global Polio Eradication Initiative (<http://www.polioeradication.org>) and the National Polio Surveillance Project (<http://www.npsindia.org>).

specific immunization, we examine differences in immunization rates between families with daughters only vs. families with sons only. If reform reduces parents' incentives to invest in daughters, we should see two patterns: first, more sons than daughters born post-reform should be immunized. Second, sons' immunization rates should increase at a faster rate than daughters' post-reform.¹³³

According to descriptive analysis of variation in sex-specific polio vaccination rates based on whether or not all children are before reform, there is no significant impact of reform. For families whose latest child is born within ten years of reform, those with daughters only immunize 83 percent of daughters *born pre-reform* (53 of 64), versus 90 percent of daughters *born post-reform* (103 of 114). In contrast, families with sons only immunize just 74 percent of sons *born pre-reform* (116 of 157) versus 87 percent of sons *born post-reform* (200 of 230). It is notable that families are generally more likely to immunize daughters than sons, both before and after inheritance reform. In fact, sons' vaccination levels in the early 1980s, prior to reform, are nearly 20 percent lower than daughters'. Vaccination rates for sons and daughters follow similar trends both before and after reform, indicating an insignificant impact of reform on parent's sex-specific investment in children.

We next use difference in differences regression to identify reform's impact on sex-specific rates of child vaccination independent of geographic and time trends in sex-specific rates of vaccination. Parallel trends in sons' and daughters' pre-reform immunization rates confirm that difference in difference regression is the appropriate analytic tool. If reform changes incentives for parental investment in daughters, we should observe different rates of change for vaccination rates post- vs. pre-reform in families with daughters relative to families with only sons. In order to compare families that are as alike as possible, we consider only those families with at most one son and one daughter. If reform diminishes parental care for daughters, families with

¹³³ Both hypotheses about parents' differential investments in daughters vs. sons post-reform assume that reform encourages parents to concentrate investments in sons. However, if parents have daughters only, and do not plan on having more children post-reform, reform is unlikely to alter levels of parental investment in daughters.

only one son should be *significantly more likely* to vaccinate children post-reform vs. pre-reform than families with one daughter.

The difference in difference regressions used to analyze sex-specific polio vaccination rates take the following form:

$$\text{polio vaccination}_{mst} = \beta_0 + \beta_1 \text{Daughter}_{mst} + \beta_2 \text{Treatment}_{mst} + \beta_3 \text{Daughter}_{mst} * \text{Treatment}_{mst} + \sum_s \text{State Effects}_s + \sum_t \text{Time Effects}_t + \gamma \text{Controls}_{mst} + \varepsilon_{mst} \quad (6)$$

where the dependent variable is an indicator variable for whether or not mother m 's children are vaccinated against polio, for a given mother m , born in year t , living in state s . Equation 9 includes three additional indicator variables: Daughter_{mst} is set to one if a family has a daughter, and zero otherwise. Treatment_{mst} is set to one if a given mother in state s born in year t has a father who passes away after reform and marries post-reform, making her eligible for equal inheritance rights and hence treated by reform, and zero otherwise. $\text{Daughter}_{mst} * \text{Treatment}_{mst}$ is coded as one if a mother has daughters and is treated by reform. β_3 is the coefficient of interest, which measures the causal effect of eligibility for gender-equal inheritance rights for families with a daughter (vs. with one son) on the family's decision to vaccinate children against polio, assuming that these families' polio vaccination rates would follow arguably similar trends absent families' exposure to reform.

Regression results find that reform has a statistically-insignificant impact on vaccination rates of families with a daughter vs. with only one son.¹³⁴ This provides no evidence of reform's impact on sex-specific parental investment. Daughters' baseline, pre-reform rates of vaccination are slightly higher than sons', by 5.8 percent. Yet reform has an insignificant impact for families with daughters ($\text{Daughter}_{mst} * \text{Treatment}_{mst}$) across all specifications. The insignificance of reform for families with daughters holds for the full sample without any controls, as well as after including controls for mothers' characteristics (education and landholding status) and fixed effects for mothers' state of residence to capture spatial or institutional trends in sex-specific vaccination within each state, fixed effects for mothers' year of birth, and

¹³⁴ Regression results are available upon request.

for the best-specified equation which accounts for mothers' characteristics, spatial and time trends. Thus, difference in differences OLS regression analysis does not support the hypothesis that reform significantly alters parents' incentives to care for young daughters relative to young sons, at least in terms of polio vaccination practices.

In sum, this section's analysis finds evidence of a significant but small impact of reform on daughters' relative survival rates, and no evidence in support of inheritance reform's impact on sex-specific child polio vaccination rates. Taken together, these findings suggest that the significant impact of reform on the child sex ratio may be due, in part, to an increased willingness by parents to illegally abort daughters.¹³⁵ Complementary research by Balhotra and Cochrane (2010) and Jha et al. (2011) utilize large, nationally-representative datasets to analyze sex-specific differences in child survival rates based on birth order. Both studies find a significant, growing trend of sex-selective abortion across India. According to Jha and his coauthors, sex-selective abortions have increased from between 0-2 million in the 1980s, to 1.2-4.1 million in the 1990s, and now to 3.1-6 million in the 2000s. However, more precise data on infant mortality rates and use of technology for sex-selective abortions is required to determine the extent to which inheritance reform is linked to female infanticide *before* versus *after* childbirth.

Inheritance Reform & Daughters' Dowry

Reform may have a second unintended consequence if it provides an impetus for payment of higher dowries by parents. Daughters' parents may try to substitute dowry for land inheritance to avoid breaking their social contract with sons. If this is indeed the case, reform should be correlated with a significant, positive increase in the size of monetary dowries reported by families in the Rural Economic and Demographic Survey. Given the illegality of dowry payment, we can assume that these figures represent a lower bound on actual dowry amounts. It is notable that despite dowry's

¹³⁵ Despite laws restricting the use of sex selection technologies such as ultrasound since their mass availability in the mid-1990s, such technology is increasingly popular as a means of selectively aborting daughters (Bhalotra and Cochrane 2010; Jha et al. 2011; Rosenblum 2012).

illegality, public requests for dowry – along with evidence of their payment – are rampant (Anderson 2003; Bloch and Rao 2002). Thus, dowry's illegality is unlikely to prevent families from discussing it with surveyors.

[Table 8 about here.]

Regression results presented in Table 8 show that reform has a positive impact on the size of daughters' dowries within landed, as opposed to landless families. These results are significant for the best-specified cases (columns 6-7). Note that these results measure reform's impact conditional on the date of grandfather's death to provide the most precise measure of reform's impact possible. By increasing the cost of dowry demanded for daughters, reform has negative, unintended consequences because it increases parents' direct, monetary cost of raising daughters. Additionally, research documents a strong association between the rising cost of dowry and the abuse of daughters, as parents-in-law demand higher additional dowries from daughters' natal families post-marriage (Bloch and Rao 2002). Overall, this analysis presents a second, concerning dimension of inheritance reform's unintended consequences on daughters' value and welfare in contemporary Indian society.

Conclusions

This paper investigates whether gender-equalizing reform of land inheritance reform, increases or decreases daughters' value, measured by the child sex ratio (daughters : sons) reported by women eligible vs. ineligible for reform. This paper proposes a simple, decision-theoretic model for understanding reform's impact, whereby reform makes daughters relatively more expensive than sons in light of traditional marriage norms. Mainstream norms dictate that any investments in daughters "leak out" of the natal family upon daughters' marriage into husbands' (usually) geographically- and socially-distinct family. In contrast, reform does not change the cost of raising sons. As a result, reform increases daughters' relative cost. Hence, we should expect the ratio of daughters to sons to fall post-reform.

This paper used difference in difference analysis of nationally-representative survey data to test these hypotheses. Empirical analysis found evidence of resistance to legal reform within the household, as predicted by the decision-theoretic model. In fact, reform has a strong negative impact on women's child sex ratio. The causal mechanism behind these results is confirmed by secondary qualitative and quantitative analysis: by mandating equal land inheritance shares for daughters reform forces parents to break their social contract with sons: the security of long-term care by sons in exchange for the entirety of parents' inheritance. Parents' efforts to avoid breaking their 'social contract' with sons also result in a second unintended consequence of reform: increased dowries for daughters' marriages in an effort to substitute monetary dowry for inheritance rights. Both phenomena have the effect of increasing the cost of raising daughters – relative to sons. These findings highlight the dangers of attempting gender-equalizing reform in the face of India's contradictory social norms, absent engagement with the household-level political economy of gender-specific investments that undergirds norms.

Overall, this paper points to the value of additional analysis on several fronts. First, as mentioned above, analysis of national reform's impact will be crucial to determine the generalizability of this paper's evidence of reform's perverse impact in the South Indian states that pioneered reform. Second, the political process by which local political officials began using "vote bank politics" to systematically target respond to women's demands in rural South India requires much greater attention (Srinivas 1955). A forthcoming historical paper will address this topic. Third, qualitative investigation into the process by which coalitions mobilize to support or resist reform within and across villages is required to explain significant variation in village-level responses to reform (Nelson 2011).

Accounting for Accountability: Local Governance & Gender-equality in Rural India

Abstract

Accountability is widely acknowledged as a key explanatory variable predicting the quality of governance. The literature to date has focused mainly on accountability as it relates to the scope and quality of public goods distribution. This paper expands our understanding of accountability by building upon the dissertation's prior papers which show that perceptions of accountability matter, in particular for determining where gender-equalizing reform's impact is positive. Here I explore the sources of variation in accountability using innovative survey measures of accountability as citizens' perceived ability to demand realization of their legal rights from local officials and regression analysis with hierarchical models. Three factors determine variation in accountability. First, individual characteristics matter: officials are less accountable to women than men, and are more accountable to individuals with higher education levels, older ages, and those who do not migrate for work. The paper also reveals to critical sources of variation in accountability. Exogenously-determined reservations for female-only elected *Pradhans* (Village Heads) improve men's and women's perceptions of local officials' accountability, both in terms of general priorities and women's specific priorities. Additionally, elections matter. Perceptions of local officials' accountability are significantly correlated with the competitiveness of prior (lagged) local elections. Overall, this paper's findings suggest the importance of political institutions – reservations and electoral competition – in determining variation in the quality of governance.

Introduction

What do we know about local officials' accountability for legal enforcement, particularly in hard cases where law contradicts deeply-entrenched norms? Existing literature emphasizes a one-dimensional notion of accountability based on local officials' public goods distribution.¹³⁶ Such measures of accountability are widely accepted as a proxy for the quality of governance.¹³⁷ This dominant conception of accountability ignores two key functions of the state: enforcement and empowerment. In particular, women's empowerment is widely-acknowledged as a crucial factor in political and economic development.¹³⁸ Research indicates that local officials' perceived level of accountability to women's priorities is a key predictor of legal reform's capacity to improve gender equality in a crucial domain for development: the distribution of land inheritance.¹³⁹

This paper seeks to uncover the roots of variation in state capacity to bring about gender equality via local accountability. "Accountability" is operationalized as citizens' perceived ability to demand realization of their legal rights from local officials, both in gender-neutral and gender-specific contexts. The paper identifies significant individual, village, and regional sources of variation in perceptions of accountability. The key finding is that dynamic local institutions and colonial land tenure institutions' legacies determine gender-based differences in perceptions of local officials' accountability.

Local government can be a very different animal depending on who holds its reins. Consider one of Andhra Pradesh's "backward" districts tilted toward secession,

¹³⁶ Alesina, Baqir, and Easterly 1999; Banerjee and Somanthan 2007; Bates 1981; Diaz-Cayeros, Estévez, and Magaloni Forthcoming; Posner 2005; Tsai 2007.

¹³⁷ Kohli 2001; additionally, a growing body of work documents the role of public information as a source of higher accountability and improved public goods provision. On this, see: Besley and Burgess 2002; Besley and Prat 2002; Ferraz and Finan 2008; Keefer and Khemani 2011, 2012; and an excellent summary of the literature by Diaz-Cayeros, Estévez, and Magaloni Forthcoming.

¹³⁸ On the importance of women's empowerment for political development, see: Aidt and Dallal 2008; Buch 2000; Chattopadhyay and Duflo 2004; Dollar, Fisman, and Gatti 2001; Duflo 2003, 2012; Duflo and Topalova 2004; Lindberg et al. 2011; Miller 2008; UN 2005; World Bank 2011. On economic development, see: Braun and Kvasnicka 2009; Duflo 2003; Duflo and Udry 2004; Thomas 1990, 1993.

¹³⁹ See Brulé 2013.

Khammam. In two villages where “reservations” have mandated the election of female village council heads (*Pradhans* or *Sarpanches*), the women and their constituents interviewed highlight the local government’s positive role in supporting their rights.¹⁴⁰ They lent a particular importance to government schemes for redistributing land rights to socially-disadvantaged groups – both according to caste and gender. The female *Pradhans*, along with women in the villages they represent, frequently argued that “land [titles] made a lot of difference”¹⁴¹ and identified land redistribution as the most meaningful tool for ensuring daughters’ lives will be better than their mothers’.¹⁴² The land redistribution programs’ impact is significant: in both villages with female *Sarpanches*, the majority of women hold land in their names, mainly due to recent government redistribution programs.¹⁴³ This contrasts greatly with the tiny minority of women holding land in nearby villages, both in Khammam and its rich neighbor, Krishna district.¹⁴⁴

Digging one level deeper into local government bureaucracy explains how female *Pradhans* promote productive shifts around land rights in these villages: successful coalitions with land revenue administrators. One village-level land revenue bureaucrat (*Tehsildar*) explained his role as the *Pradhan*’s engaged ally in promoting women’s land rights: “unless and until we involve ourselves in [women’s] families, their languages, and their practices, awareness [of gender equal land rights] will not happen”.¹⁴⁵ At that time, he was preparing to redistribute another 300 acres of state land amongst 200 eligible women. All land will be given in women’s names, he explains: “so they know they [personally] have title”.¹⁴⁶ *Tehsildars* face three sets of incentives to join coalitions with female *Pradhans* to improve women’s land rights: first, changes in land rights increase the potential number of transactions landholders

¹⁴⁰ Recent work by Gabrielle Kruks-Wisner (Unpublished) in Rajasthan finds that the village council head is the dominant source of assistance for individuals making claims on the state in 105 villages.

¹⁴¹ Author’s interview of 30 March, 2010 in Mudigonda Mandal, Khammam District, Andhra Pradesh.

¹⁴² Author’s interview of 5 April, 2010 in Madhira Mandal, Khammam District, Andhra Pradesh.

¹⁴³ Relevant Mandals include: Madhira and Mudigonda.

¹⁴⁴ For example, villages in Nelakondapally mandal, Khammam and Reddygudem mandal, Krishna.

¹⁴⁵ Author’s interview of 30 March, 2010, Mudigonda Mandal, Khammam District, Andhra Pradesh: Tehsildar and Deputy Tehsildar.

¹⁴⁶ Ibid.

complete with *Pradhans*, which are a lucrative source of non-official income; second, extensive implementation of state projects may help bring *Pradhans* accolades from their superiors, which are a significant resource for ensuring long-term career success; and third, by helping *Pradhans* who are passionate about improving women's land rights, *Tehsildars* gain both the psychic benefit of appreciation for their work and the pragmatic benefit of accumulating political influence.

This strategy stands in stark contrast with practices in a neighboring mandal outside the female *Pradhan's* constituency, where community leaders attempting to resolve familial disputes over women's land rights exclusively work around the local land revenue bureaucracy. They argue: "Who will ... talk to the *Tehsildar*? What will he do for you?"¹⁴⁷ Such assessments of administrators' disengagement were confirmed by *tehsildars'* own explanations that "all daughters are getting equal shares of land so contestation of [women's land rights] isn't necessary".¹⁴⁸ In sum, these cases illustrate how the presence of female *Pradhans* can facilitate coalitions with the administrative officials aimed at promoting and enforcing government projects to improve social equality, both for women and for other groups facing discrimination such as lower castes.

Hypotheses

This paper seeks to explain variation in local officials' accountability to individuals in a democracy with one of the highest levels of variation in gender equity: India. The relationship between democracy and accountability is extensively documented, as is the relationship between democracy and gender equity.¹⁴⁹ Although India's ancient history of democracy in the form of *panchayats* or local collectives is widely-

¹⁴⁷ Author's interview of 26 March, 2010, Khammam District: Village II, Respondent I.

¹⁴⁸ Author's interview of 25 March, 2010, Khammam District Headquarters.

¹⁴⁹ On the relationship between democracy and accountability, see: Baum and Lake 2003; Besley and Kudamatsu 2006; Chhibber and Nooruddin 2004; Foster and Rosenzweig 2004; Olken 2010; Stasavage, 2005. On democracy and gender equity, see: Alexander and Welzel Unpublished; Beer 2009; Inglehart & Norris 2003; Inglehart & Welzel 2005; McDonagh 2002.

acknowledged,¹⁵⁰ India also has some of the most extreme gender disparities in the world. The UNDP's Gender Inequality Index, as of its 2011 Human Development Report ranks India as 129 out of 146 countries, behind all other South Asian states except Afghanistan. This categorization masks incredible variation in gender equity and democratic institutions across India, which is often explained in terms of 'exceptional' versus 'ailing' states rather than within a unified analytic framework, as is attempted in this paper.¹⁵¹

This paper predicts three sources of variation in accountability: first, at the individual-level, the determinants of a person's social and economic status are likely to alter perceptions of one's ability to hold local officials accountable. Specifically, individuals who are: female, of a young age, possessing little-to-no land, members of a Scheduled Caste, or Muslim are likely to perceive local officials as less accountable than others. These hypotheses follow a well-developed literature on the nature of individual-level political disadvantages and power in rural India (Agarwal 2001; Ban, Jha, and Rao 2012; Ban and Rao 2008; Bardhan, Mookherjee, and Torrado 2005; Besley and Burgess 2002; Besley et al. 2004; Mansuri and Rao 2013; Rai et al. 2001). In contrast, education is a notable factor which may empower individuals and improve their socio-economic status, with subsequent benefits for their perceptions of political agency (Ban and Rao 2008).

Additionally, individual "mobility", operationalized as migration for work, could either augment or constrain women's perceived ability to hold officials accountable (Chhibber 2002; Yang 2011). We can expect migration for work to indicate freedom to move outside the household as well as an ability to act independently, thanks to the income earned outside of the household, for those who migrate versus those who do not, all else equal (Chhibber 2002). If so, a given woman's migration for work can act as a proxy for her mobility. A range of studies indicate that more mobile women are more able to bargain for autonomy to make their own decisions within the household and more likely to be politically engaged outside the household (Anderson and

¹⁵⁰ Roy 2012.

¹⁵¹ Dreze and Sen 2002.

Eswaran 2009; Chhibber 2002; Deshpande 2009; Rai 2011). This literature predicts that local officials will be more accountable to more mobile women who migrate than others. Yet predictions differ if women use mobility for work to exercise one specific form of empowerment: exit (Hirschman 1970). In this scenario, women's migration for work may actually indicate their disengagement from a given locality's concerns. Thus, migration should reduce women's perceived interest in holding local officials accountable. These women are more likely to evaluate officials as hard to hold accountable, given their disinterest in devoting resources to engage local officials.

Second, at the village level, exogenously-imposed "reservations" for female-only candidates in elections for the post of village council head (*Pradhan*) may alter perceptions of local officials' accountability.¹⁵² "Reservations" have been shown to increase local governments' provision of women's preferred public goods (Chattopadhyay and Duflo 2004) and facilitate gender-equalizing land inheritance reform (Brulé 2013), with persistent effects after reservations' withdrawal (Bhavnani 2009). Perceptions of accountability may improve following experience with "reservations" if the elected female officials' quality of service is higher. In contrast, biases against women's political effectiveness may skew individual assessments, and thereby diminish perceptions of accountability (Ban and Rao 2008; Chattopadhyay and Duflo 2004; Duflo and Topalova 2004).

The paper posits that reservations improve local officials' accountability to individual demands for realization of legal rights for two reasons: one, reservations are identified as a cause of decreased corruption and increased accessibility to local government officials (Duflo and Topalova 2004; Beaman et al. 2008; Munshi and Rosenzweig 2008); two, because reservations propel a vulnerable class of citizens into public office, it is extremely likely that these citizens will need to create additional monitoring and accountability mechanisms to perform their functions safely and effectively. For example, female *Pradhans* interviewed during field research generally held meetings in public, open squares or terraces as a method of ensuring their personal safety and

¹⁵² I refer to the 72nd and 73rd constitutional amendments, passed in 1992, which directed India's state governments to conduct elections at local levels, devolved expenditure and oversight powers to these elected bodies, and mandated the reservation of one-third of seats in these bodies for women.

reputation were unable to be exploited either by political operators or the greater village community. The additional transparency and public accessibility of political officials should broaden and deepen the scope of individuals' access to local political officials, with benefits in citizens' perceptions of officials' accountability.

Third, greater competitiveness of village-level elections may improve perceptions of accountability, as political competition tends to spur elected officials' incentives for accountability. Although political parties are banned from village-level elections, this does not preclude significant electoral competition for political positions. Analysis relies on a standard measure of electoral competition to capture the competitiveness of *Pradhan* elections: the margin of victory between the winning candidate and the runner-up. To avoid problems of endogeneity, the paper uses a lagged measure of electoral competition based on the election one period before the most recent election (five years previous). Greater electoral competition (e.g. smaller margins of victory) should be a significant, positive predictor of local officials' perceived accountability if competition creates incentives for local officials to seek out and respond to constituents' priorities with regard to realization of legal rights.

The paper proceeds by briefly outlining the data and methodology utilized, presents results, and concludes with a brief interpretation of the findings with an eye towards their significance for theory and practice.

Data and Empirical Methodology

This paper relies on data from the National Council of Applied Economics (NCAER)'s Rural Economic and Demographic Survey (REDS). It analyzes the most recent, 2006/8 round of the nationally-representative panel survey, which covers 8,659 households from 240 rural villages in 17 Indian States (Figure 1). It relies in particular on survey questions related to political institutions, participation, and local political competition to identify the determinants of local officials' accountability across 17 Indian states.

The dependent variable of interest is one of two measures capturing individual perceptions of local officials' accountability. The first "general" measure of perceived accountability is based on answers to the following REDS question: "How easy is it for you to hold local officials accountable for the functions they are supposed to be performing?" Responses are based on a discrete scale that ranges from 1 ("impossible") to 5 ("no problem at all"). All adult household residents are asked this question, yielding a total of 25,550 responses across 17 states. Figure 1 presents the variation in village-level averages of local officials' "general" accountability across the 17 states included in REDS 2006/8 round.

The second dependent variable relates specifically to the ease with which individuals can hold local officials accountable for women's priorities. This question is one of a series of hypothetical scenarios meant to elicit individuals' responses about the most likely result in their village. In this particular scenario: "Meenakshi, the four-year-old daughter of Rajesh fell ill after eating the food provided by the noon meal program. When Lakshmi, the wife of Rajesh went to complain to the school, she was rebuked and asked to talk to the Pradhan (Panchayat President). She has since asked Rajesh to talk to the Pradhan." The surveyor is then prompted to ask the respondent: "How easy is it for Lakshmi to hold the local officials accountable for performing their functions?" As in the first measure of accountability, evaluations range between 1 ("impossible") and 5 ("not a problem at all"). All adult household residents are asked this question. In this case there are a total of 25,607 responses across all 17 states.

Figure 2 maps the variation in perceptions of local officials' accountability to women's priorities across the 17 states for which REDS provides data. The histogram in Figure 3 indicates that responses follow an approximately normal distribution, as is also roughly true for the responses to the prior, "general" measure of accountability.

Independent variables of interest include individual socio-economic characteristics which are key determinants of individual status in rural India: the highest level of education attained (ranging from zero, indicating no education, to six, signifying a

post graduate degree), and indicator variables for sex, parents' landholding status,¹⁵³ membership in a Scheduled Caste and Muslim identity. Village-level variables include traditional factors hypothesized to influence the ease with which members of a given community can hold government officials accountable: logged village population according to India's 2001 census, village wealth,¹⁵⁴ mobility, which is based on the distance between the village and the nearest paved road in terms of minutes of travel time, and the influence of district and state-level politics, based on the distance between the village and the district Head Quarter in minutes of travel time.

Findings

Analysis focuses on the results of ordered probit regressions combined with hierarchical models. Ordered probit regressions are used because the key dependent variable is ordinal with more than two potential values, complemented by basic geospatial analysis. Most generally, Tables 1 through 4 indicate similar sources of variation in individual- and village-level predictors of local officials' perceived accountability in gender-neutral and gender-specific contexts.

At the individual level, Tables 1 and 2 indicate several similar sources of variation in local officials' perceived accountability to individuals across gender-neutral and gender-specific contexts. Local officials are perceived as significantly more accountable to men versus women, to individuals with more versus less education, to older versus younger citizens, and to landholding versus landless individuals. Strikingly, one indicator of mobility: migration for work¹⁵⁵ is a consistently significant, negative predictor of variation in local officials' accountability with respect to

¹⁵³ Parents' landholding status can be thought of as a one-generation lag in a given individual's landholding status. This is used to avoid the bias that state land redistribution schemes may cause upon individual perceptions of local officials, at least for direct beneficiaries of such schemes.

¹⁵⁴ Absent reliable measures of village income, I measure village wealth as the ratio of gross-to-irrigated land in a given village. Given that all villages in the sample are rural with agriculture-based economies, I assume that wealthier villages are able to use a combination of agricultural technology and irrigation to double-crop land, resulting in higher ratios than poorer villages which have more limited access to technology and irrigation.

¹⁵⁵ This variable takes a value of 1 if an individual migrates for work in the year of the survey, and 2 if they do not. Thus, a positive sign is indicative of a negative relationship between migration and accountability.

women's priorities but not for local officials' general accountability. The remainder of this section explores the magnitude of the relationship between accountability and three significant independent variables: gender, education, and mobility using the proxy of migration for work.

Figure 7 presents simulations showing the impact of varying sex and educational attainment on the probability that local officials are perceived as highly-unaccountable (a score of 2, indicating it is "quite difficult" to hold local officials accountable). These simulations use the gender-neutral measure of local officials "general" accountability, holding all other variables at their means. The first set of simulations indicate that across all education levels, women perceive local officials as more than twice as likely to be highly unaccountable to them versus to men. The second set of simulations in Figure 7 illustrate a significant, but slightly smaller gap between women's and men's perceptions of highly-accountable officials (cases where officials receive a score of 4, indicating it is "very easy" to hold them accountable) which is consistent across education levels.

In contrast to Figure 7, Figure 8's simulations show that education can diminish the gender gap in the perceived difficulty of holding local officials accountable *for women's priorities*. Specifically, there is only a ten percent difference between the probability that women and men consider it "very easy" to hold officials accountable for women's priorities where they both have high levels of education (some experience of college).

Figure 9's simulations provide a visual representation of the marginal impact of migration for work on women's perceptions of local officials' accountability to their priorities. We might expect migration for work to indicate freedom to move outside the household as well as an ability to act independently, thanks to the income earned outside of the household, for those who migrate versus those who do not, all else equal. If so, a given woman's migration for work can act as a proxy for her mobility. A range of studies indicate that more mobile women are more able to bargain for autonomy to make their own decisions within the household and more likely to be politically engaged outside the household (Anderson and Eswaran 2009; Chhibber 2002;

Deshpande 2009; Rai 2011). If women's migration is an appropriate proxy for their mobility, such studies predict that local officials will be more accountable to women who migrate versus those who do not. An alternate body of research suggests that increasing women's work outside the home may severely constrain their ability to accomplish both domestic and public duties (Folbre 2009; Rao 2005; Yang 2011). If this work is accurate for women in contemporary rural India, women's migration for work may actually reduce their perceived ability to hold local officials accountable.

This paper's empirical analysis suggests a negative relationship between women's labor-based mobility and their public empowerment. Figure 9 shows that local officials are fifty percent more likely to be perceived as highly accountable (a value of 4) by women who *do not migrate*, as compared to women who *do migrate*. Additionally, local officials are fifty percent more likely to be perceived as poorly accountable (a value of 2) by women who *do migrate*, versus women who *do not migrate*. These results provide suggestive evidence that women use migration for work as a means to empower themselves by exiting the village, and thus disengaging from local politics and the process of holding officials accountable.

In terms of the hypothesized village-level sources of variation in accountability, Tables 3 and 4 present strong confirmation of this paper's hypotheses. First, the exogenously-determined implementation of reservations for female *Pradhans* is consistently a statistically-significant predictor of improved perceptions of local officials' general accountability (Table 3). Although reservations do not predict significantly greater accountability to women, they are a statistically significant predictor of local officials' improved accountability with respect to *women's priorities* (Table 4). In conjunction, these findings suggest that reservations improve local officials' responsiveness in multiple domains: to men's as well as women's priorities. Figure 10's simulation of reservation's impact on the probability of local officials' levels of general accountability, again holding all other variables at their means, indicates that officials in villages with an experience of reservations for female *Pradhans* are more likely to have high accountability scores (4) and less likely to have moderately-low accountability scores (2) than villages without reservations.

Additionally, the regression results in Tables 3 and 4 show that village-level competition for the elected post of *Pradhan* is a consistent, statistically-significant predictor of local officials' accountability. All together, these results suggest that perceptions of local officials' accountability may vary significantly as a result of dynamic local political competition, as well as due to static factors including local political institutions (reservations) and individuals' social status in relatively rigid hierarchies based on gender, education and land owning.

In sum, this paper's analysis of local officials' accountability patterns suggests the importance of two types of dynamic local institutions for explaining local officials' highly-varied levels of accountability, in particular with respect to women's priorities: exogenously-determined "reservations" for female elected heads of local councils and local elections.

Interpretation

These findings speak to three sets of evidence which are expanding rapidly: research on micro-variation in the quality of democratic institutions, gender equality, and historical institutions. I address these sets of evidence sequentially and conclude with a synthesis of prior research and this paper's findings, with particular regard for establishing an agenda for future research.

Micro-level Variation in Democratic Institutions

A growing body of work seeks to pinpoint micro-level variation in the quality of democracy as measured in terms of the relationship between citizens and their elected representatives. This research stands in contrast to the broad surveys of electoral politics conducted in the two decades following India's Independence, which sought to determine whether elections engendered mass participation or elitism (Narain 1978). These early studies frequently depicted the majority of voters, centered in rural India as "inarticulate, parochial, and passive" (Narain 1978, 121, c.f. Singer 2007, 17).

Today, a growing body of micro-level studies captures variation in state-citizen engagement as based on the nature of community-level access to information, ethnic coalitions, and reliance on political parties for public goods, where political intervention may be either coercive, corrupt, or cooperative (Banerjee and Somanathan 2007; Bussell 2012; Dunning and Nilekani 2013; Habyarimana et al. 2007; Stokes 2005). This paper's findings suggest reason to further disaggregate research to capture the impact of individual, rather than community-level variation in social, economic, and political identities and opportunities. In addition, it is striking that the largest source of individual-level variation in perceptions of accountability is based upon gender, which is a rarely studied determinant of the quality of governance (Deshpande 2009).

Gender Equality

Interest in women's engagement with the state has increased dramatically, both by researchers and policy-makers, following the 72nd and 73rd Constitutional Amendments' mandate for women's representation within Panchayati Raj institutions. A small but growing body of work attempts to explain the gap between women's and men's political participation (Deshpande 2009). Explanations center on women's limited mobility due to social norms, which confine women to the household as well as restricted access to property, independent income, and opportunities to develop social and political networks outside the family (Agarwal 1994; Anderson and Eswaran 2009; Banerjee 2008; Chhibber 2002; Folbre 2009; Rai 2011; Singer 2007). In addition, limited space for female candidates provided by political parties provides little encouragement for women's political aspirations (Basu 1992; Ray 1999).

In order to understand the dynamic nature of women's engagement with the Indian state, it is necessary to consider the historical process of social institution's development and change in India. This paper's next section discusses the potential for future research on the role that historical land tenure institutions might play in determining current local officials' perceived accountability with respect to women's priorities. The hypothesized causal mechanism is historical land tenure regimes'

ability to foster either equality or inequality in land ownership, which subsequently determined the degree of equality in social institutions.

On this topic, it is notable that land tenure regimes – mainly developed in the first half of the 19th century – proceeded women’s political enfranchisement by nearly a century. The Montague–Chelmsford Reforms of 1919 established provincial legislatures under British colonial rule which allowed women’s suffrage, with terms negotiated by each province. In general, women’s power to vote depended on their husbands’ tax status and their own education (Basu 2008; Singer 2007, 42). Similarly, the Government of India Act of 1935 allowed women’s participation in Provincial Legislative Assemblies based on either their husbands’ payment of income tax or their own literacy (Singer 2007, 42). Although universal suffrage was declared as of Independence, a tendency to consider women’s votes as representing their husband’s preferences continues to date (Singer 2007, 207). Such assumptions have provided a tacit rationale for limited research on the nature of gender differences in the state-citizen relationship, with very few exceptions (Iyer et al. 2012).

In this context, the findings on gender are significant for three reasons: first, it is important to note the magnitude of contemporary gaps between local officials’ perceived accountability by women versus men, which suggest a critical disincentive for women’s political engagement with the state independent of their abilities and influence, both in private and public domains. Second, as discussed in the next section, historically-rooted land tenure institutions might be one source of variation in historical trajectories of (in)egalitarian social institutions which could help identify regional trends in local officials’ accountability with respect to women’s priorities.

Third, the relationship between the generally-understood levers for women’s empowerment and local officials’ accountability are more complex than traditional wisdom suggests. High levels of education can allow women to span the perceived gender gap in local officials’ accountability. In contrast mobility – in the form of migration for work – may actually constrain women from holding local officials accountable by limiting their time for engagement in the public sphere. These

constraints to women's political engagement are particularly severe in the context of traditional institutions that prescribe significant domestic duties for women.

Historical Land Tenure Institutions

Historical land tenure institutions may help explain a striking regional pattern of variation in accountability is clear from Figures 2 and 6: East-West differences in perceptions of local officials' accountability, with positive outliers at the two poles of the sub-continent where data is available: the Punjab and Kerala. Red and orange dots indicate below-average accountability; yellow dots indicate "average" assessments (3-3.5), whereas light and dark green dots indicate above-average accountability. Within South India, it is notable that while Kerala is unquestionably a positive outlier in terms of local officials' accountability, the rest of the region is far more varied than the traditional north-south division used to explain varied quality of governance and gender equality (Dreze and Sen 2002; Dyson and Moore 1983).

The long-term influence of colonial land tenure regimes may help identify this variation in accountability patterns. During the first half of the 19th century, British colonial administrators experimented with several methods of collecting the land tax which constituted the major source of their revenue (Baden-Powell 1882). Colonial land tenure patterns are found to predict variation in contemporary Indian states' agricultural investments (Banerjee and Iyer 2005). Banerjee and Iyer find that historical land tenure systems' influence stems from their initial role determining levels of land and wealth inequality. Although land reforms implemented post-Independence altered the most egregious forms of land inequality, Banerjee and Iyer argue that historic land inequalities explain variation in independent states' propensities to adopt new technology. A complementary literature on government responsiveness in rural India suggests that land and wealth inequality constrain vulnerable groups' influence within local government (Ban and Rao 2008; Bardhan, Mookherjee, and Torrado 2005; Besley et al. 2004).

One potential hypothesis follows: colonial land tenure patterns should predict variation in contemporary perceptions of local officials' accountability *with respect to*

women's priorities because of their enduring importance for social equality. Specifically, where tenure arrangements promoted land equality (vs. inequality), social institutions should be more equal. Equality-oriented institutions should promote higher levels of local government's accountability to the priorities of groups who are traditionally disadvantaged, including women.

We can operationalize this hypothesis by moving beyond the comparison of landlord- and non-landlord based tenure structures which is the key source of institutional variation according to Banerjee and Iyer (2005). In addition, it is worth considering equality-enhancing corporate-style land tenure arrangements' influence. These arrangements emphasized payment of tax according to locally-assessed individual capacities and were utilized both by British administration and by select territories not ruled by the British, known as Princely States (Figure 4).¹⁵⁶ Regional patterns of accountability *with respect to women's priorities* should vary based on the extent to which colonial land tenure arrangements fostered equality (corporate-based tenure), were equality-neutral (individual-based tenure) or fostered inequality (landlord-based tenure).

In contrast to prior work (Banerjee and Iyer 2005), this paper's classification also includes land tenure arrangements in Princely States. This requires two additional categories of tenure: royal grants of tax-exempt land to individuals, who in practice collected tax from the multiple villages located within their royal grants; and state-managed individual taxation of tenants on state-owned lands, known as *circar* or *pandaravaka* (Thomas 2010). This final arrangement appears closest to the British government's village-based cultivation system, which emphasized payment of tax

¹⁵⁶ Figure 4 summarizes land tenure regimes at the state-level. Classification is based on Banerjee and Iyer (2005), supplemented by information in Baden-Powell 1882; Kumar 2005; Raikes 1855; Swamy 2011; Talbot 2007; Thomas 2010. The proposed classification includes Princely States. This requires two additional categories of tenure: royal grants of tax-exempt land to individuals, who in practice collected tax from the multiple villages located within their royal grants; and state-managed individual taxation of tenants on state-owned lands, known as *circar* or *pandaravaka* (Thomas 2010). This final arrangement appears closest to the British government's village-based cultivation system, which emphasized payment of tax according to locally-assessed individual capacities (Baden-Powell 1882; Kumar 2005; Raikes 1855; Swamy 2011; Talbot 2007; Thomas 2010).

according to locally-assessed individual capacities (Baden-Powell 1882; Kumar 2005; Raikes 1855; Swamy 2011; Talbot 2007; Thomas 2010).

A basic examination of the hypothesis that regional patterns of accountability *with respect to women's priorities* follow colonial land tenure arrangements is possible by comparing the maps in Figures 2 and 3. Independent states which fostered equality-neutral individual-based tenure systems, such as those formerly in the Madras and Bombay presidency, should have higher levels of accountability with respect to women's priorities than states with inequality-enhancing landlord-based tenure systems, such as those formerly in the Bengal presidency. Finally, accountability should be highest where equality-fostering corporate-based tenure systems existed: in the Punjab and Kerala's Princely States (especially Travancore). Indeed, this is the pattern that emerges upon visual examination of Figures 2 and 3, as well as in Figure 6's mapping of the geo-spatial trends in Figure 2. While further analysis of the geo-spatial trends is beyond this paper's scope, the results suggest an important avenue for future research

In conclusion, this paper's results suggest the importance of identity and institutions – contemporary “reservations” and electoral politics, as well as the potential for historical land tenure regimes' explanatory power – in determining variation in the quality of governance, in particular with respect to local officials' accountability for gender equality's enforcement. Further research will probe the relationship between regional patterns of electoral competitiveness and historical land tenure regimes and will test the robustness of historical institutions' impact on contemporary perceptions of local officials' accountability.

Appendices: Paper 1

Table 1: Reform's Impact on Equality of Daughters' Land
Inheritance Share, *All States*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Father Dies	0.0004	0.0019	0.0038	0.0088	0.0067	0.0095	0.0053
Post-reform	(0.0068)	(0.0070)	(0.0099)	(0.0086)	(0.0099)	(0.0090)	(0.0108)
Marriage		-0.0218*	-0.0463	-0.0390*	-0.0533**	-0.0390*	-0.0537*
Post-reform		(0.0110)	(0.0317)	(0.0173)	(0.0187)	(0.0204)	(0.0223)
Reform		0.00299	0.0283	0.0366	0.0650*	0.0365	0.0648*
Applies		(0.0169)	(0.0402)	(0.0302)	(0.0311)	(0.0313)	(0.0325)
Constant	-0.133***	-0.132***	-0.131***	-0.190***	-0.187***	-0.244***	-0.232***
	(0.0032)	(0.0032)	(0.0038)	(0.0081)	(0.0133)	(0.0112)	(0.0169)
<i>N</i>	9075	9064	2560	2560	2560	2559	2559
<i>Reform</i> ±5yr			Yes	Yes	Yes	Yes	Yes
<i>Controls</i>				Yes	Yes	Yes	Yes
<i>State FE</i>					Yes		Yes
<i>Birth Yr FE</i>						Yes	Yes
adj. R^2	-0.000	0.001	-0.000	0.074	0.092	0.082	0.099

OLS Regressions. Robust standard errors in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, **** $p < 0.001$. Standard errors are clustered at the village level. The sample includes Hindu landholding families where adult's fathers passed away from all 17 states in REDS. "Reform applies" refers to the interaction of "Father Death Post-Reform" & "Marriage Post-Reform" indicator variables. "Reform ±5yrs" refers to the subsample of families whose fathers pass away within five years before/after reform. "Time fixed effects" refer to fixed effects for the year of father's birth. Controls include: membership in a Scheduled Caste (Y/N), dowry (Rs.), years of schooling, and the number of daughters in the natal family.

Table 2: Reform's Impact on Equality of Daughters' Land Inheritance Share, *for Comparison Groups at the Border of Andhra Pradesh, Karnataka & Tamil Nadu*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
FatherDeath PostReform	0.017 (0.012)	0.014 (0.012)	0.009 (0.022)	0.033 (0.026)	0.021 (0.031)	0.039 (0.024)	0.032 ⁺ (0.017)
Marriage PostReform		-0.025 [*] (0.011)	-0.038 (0.037)	0.001 (0.043)	0.036 (0.030)	-0.040 (0.069)	-0.014 (0.063)
Reform Applies		0.018 (0.021)	0.105 ^{**} (0.033)	0.059 (0.037)	0.015 (0.028)	0.140 ⁺ (0.080)	0.103 (0.092)
Constant	0.021 ⁺ (0.011)	0.025 [*] (0.011)	0.038 (0.037)	0.047 (0.039)	0.007 (0.019)	-0.048 (0.057)	-0.059 (0.035)
<i>N</i>	618	605	100	100	100	100	100
<i>Reform±5yrs</i>			Yes	Yes	Yes	Yes	Yes
<i>Controls</i>				Yes	Yes	Yes	Yes
<i>State Fixed Effects</i>					Yes		Yes
<i>Time Fixed Effects</i>						Yes	Yes
adj. R^2	0.009	0.017	0.023	0.071	0.108	0.159	0.155

OLS regressions. Robust standard errors are clustered at the village level in parentheses: ⁺ $p < 0.10$, ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$. The sample includes Hindu landholding families from the tri-state border. "Reform applies" refers to the interaction of "Father Death Post-Reform" & "Marriage Post-Reform" indicator variables. "Reform ±5yrs" refers to the subsample of families whose fathers pass away within five years before/after reform. "Time fixed effects" refer to fixed effects for the year of the daughter's birth. Controls include: membership in a Scheduled Caste (Y/N), dowry (Rs.), years of schooling, and the number of daughters in the natal family.

Table 3. Reform's Impact on Equality of Daughters' Household Land Inheritance Share, Conditional on *Reservations for Women*
Local Officials

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Reform	0.003	-0.107	-0.258	-0.274	-0.659***	-0.643*	-
Applies	(0.090)	(0.074)	(0.213)	(0.219)	(0.090)	(0.244)	0.902*** (0.173)
Reservations	-0.157	-0.173	-0.211	-0.192	-0.579***	-0.431*	-
for Women	(0.172)	(0.170)	(0.227)	(0.225)	(0.124)	(0.223)	0.646*** (0.117)
Reform* Reservations		0.195 (0.155)	0.868* (0.307)	0.932** (0.303)	1.297*** (0.221)	1.259*** (0.269)	1.492*** (0.202)
Constant	-0.177 (0.156)	-0.169 (0.157)	-0.144 (0.213)	-0.128 (0.219)	-0.436*** (0.0846)	0.715* (0.255)	0.395* (0.169)
<i>N</i>	454	454	111	111	111	111	111
<i>Reform</i> ±5yrs			Yes	Yes	Yes	Yes	Yes
<i>Controls</i>				Yes	Yes	Yes	Yes
<i>State FE</i>					Yes		Yes
<i>Birth Year FE</i>						Yes	Yes
adj. <i>R</i> ²	0.038	0.041	0.120	0.132	0.366	0.618	0.725

Robust standard errors clustered at the village level in parentheses: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. The sample is restricted to Hindu landholding families living in REDS districts at the tri-state border. "Reform applies" refers to the interaction of "Father Death Post-Reform" & "Marriage Post-Reform" indicator variables. "Reservations for Women" refers to whether the elected seat of village head (*Pradhan*) has been reserved for women in any of the three most recent elections (since reserved seats were mandatory in a randomly-selected 30% of every cycle of village elections). "Reform*Reservations" is the interaction of the "Reform Applies" and "Reservations for Women" variables. "Reform ±5yrs" refers to the subsample of families whose fathers pass away within five years before/after reform. Controls are: membership in a Scheduled Caste (Y/N) and whether or not parents own less than 2 acres of land (Y/N). All members of STs excluded.

Table 4. Reform's Impact on Equality of Daughters' Household Land Inheritance Share, Conditional on *Local Official's Accountability to Women*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Reform Applies	0.067 (0.088)	0.573 (0.445)	0.018 (0.661)	-0.060 (0.675)	-0.108 (0.674)	-0.681* (0.282)	-0.685* (0.292)
Accountable to Women	-0.096* (0.043)	-0.082* (0.048)	-0.060 (0.063)	-0.062 (0.062)	-0.0595 (0.056)	-0.150** (0.048)	- 0.154** (0.044)
Reform* Accountable		-0.144 (0.110)	0.120 (0.178)	0.165 (0.179)	0.165 (0.171)	0.389*** (0.095)	0.381** (0.099)
Constant	0.078 (0.223)	0.034 (0.243)	-0.076 (0.286)	-0.044 (0.291)	-0.225 (0.212)	0.837* (0.393)	0.865* (0.334)
<i>N</i>	584	584	111	111	111	111	111
<i>Reform</i> ±5yrs			Yes	Yes	Yes	Yes	Yes
<i>Controls</i>				Yes	Yes	Yes	Yes
<i>State FE</i>					Yes		Yes
<i>Birth Year FE</i>						Yes	Yes
adj. <i>R</i> ²	0.063	0.073	0.050	0.066	0.097	0.598	0.619

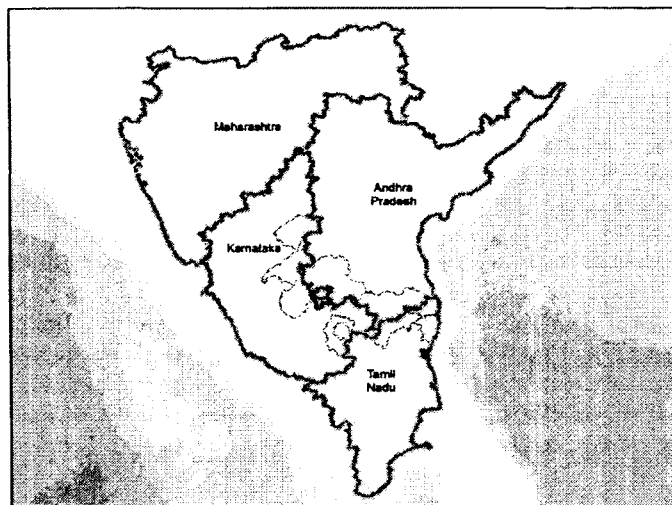
Robust standard errors clustered at the village level in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, **** $p < 0.001$. The sample is restricted to Hindu landholding families living in REDS districts at the tri-state border. "Reform applies" refers to the interaction of "Father Death Post-Reform" & "Marriage Post-Reform" indicator variables. "Reform*Accountable" is the interaction of the "reform applies" and "accountable to women" variables. "Reform ±5yrs" refers to the subsample of families whose fathers pass away within five years before/after reform. Controls are: membership in a Scheduled Caste (Y/N) and whether or not parents own less than 2 acres of land (Y/N). All members of STs excluded.

Table 5. Reform's Impact on the Equality of Daughters' Inheritance Share, Conditional on *Local Official's Accountability to the (Male) Household Head*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Reform Applies	0.0183 (0.083)	0.393 (0.374)	0.841*** (0.193)	0.855*** (0.170)	0.856*** (0.165)	0.208 (0.859)	0.204 (0.885)
Accountability to Men (Head)	-0.136** (0.049)	-0.127* (0.050)	-0.189** (0.057)	-0.185** (0.056)	-0.176** (0.053)	-0.225** (0.058)	-0.219*** (0.051)
Reform* Accountable		-0.130 (0.096)	-0.203** (0.070)	-0.202* (0.075)	-0.210* (0.076)	0.049 (0.345)	0.051 (0.354)
Constant	0.236 (0.239)	0.186 (0.242)	0.377 (0.234)	0.372 (0.233)	0.242 (0.218)	0.711** (0.242)	0.713** (0.245)
<i>N</i>	583	452	111	111	111	111	111
<i>Reform ± 5yrs</i>			Yes	Yes	Yes	Yes	Yes
<i>Controls</i>				Yes	Yes	Yes	Yes
<i>State FE</i>					Yes		Yes
<i>Birth Year FE</i>						Yes	Yes
adj. R^2	0.161	0.152	0.331	0.325	0.330	0.704	0.698

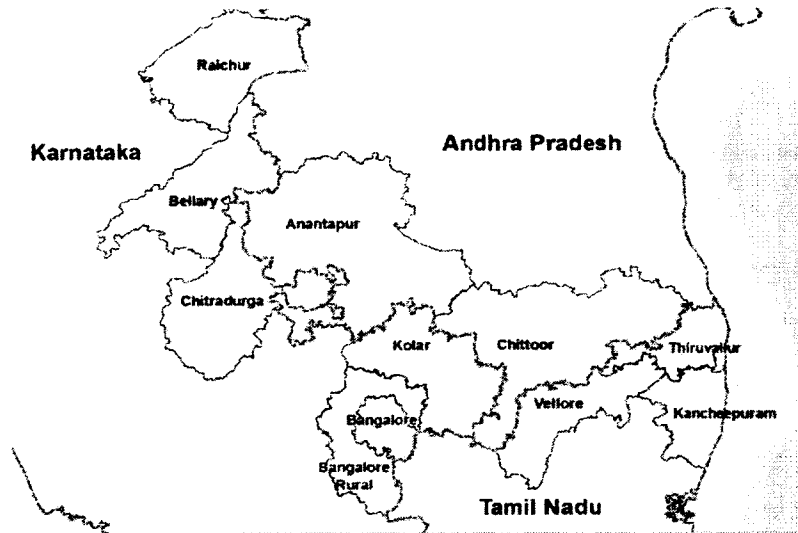
Robust standard errors clustered at the village level in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, **** $p < 0.001$. The sample is restricted to Hindu landholding families living in REDS districts at the tri-state border. "Reform applies" refers to the interaction of "Father Death Post-Reform" & "Marriage Post-Reform" indicator variables. "Reform*Local officials accountable" is the interaction of "reform applies" & "local officials accountable" variables. "Reform ± 5yrs" refers to the subsample of families whose fathers pass away within five years before/after reform. Controls are: membership in a Scheduled Caste (Y/N) and whether or not parents own less than 2 acres of land (Y/N). All members of STs excluded

Figure 1: Regional Map of Border Districts at Tri-state
Intersection



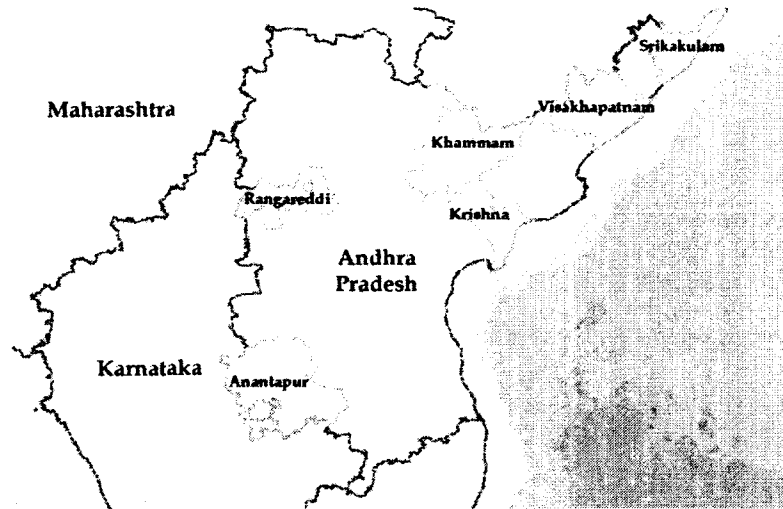
Data sample drawn from districts at the intersection of three south Indian state borders: Andhra Pradesh, Karnataka, and Tamil Nadu according to the population sample in NCAER's REDS 2006/8 round.

Figure 2. District Map of Border Districts at Tri-state Intersection



Detailed geospatial representation of districts from which the tri-state border sample of data taken from NCAER's REDS 2006/8 round was drawn.

Figure 3: Qualitative Interview Districts, Andhra Pradesh State



Map of Andhra Pradesh, India, using Census of India, 2001 political boundaries.

Figure 4. Descriptive Statistics: Women at the Tri-state Border,
REDS 2006/8

Variable	Non-Treated		Treated		Difference	
	<u>mean</u>	<u>N</u>	<u>mean</u>	<u>N</u>	<u>mean</u>	<u>s.e.</u>
Mother's Education (Yrs)	0.31	880	0.49	73	-0.19	0.168
Father's Education (Yrs)	0.82	880	0.82	73	-0.00	0.268
Number Siblings	5.80	881	5.44	73	0.36	0.268
Parents Own Land (%)	0.63	881	0.35	73	0.28	0.059***
Parents' Land (acres)	6.82	859	2.85	71	3.97	3.521
Marriage Year	1975	865	1994	73	-19.27	8.006***
Father Alive (%)	0.19	881	0.03	73	0.16	0.046***
"Hindu" (Legal Subject)	1.00	881	1.00	73	-0.00	0.006
Scheduled Caste	0.14	881	0.27	73	-0.14	0.043*
Scheduled Tribe	0.19	881	0.10	73	0.09	0.047*
Own Education (Yrs)	2.37	881	4.95	73	-2.57	0.436***
Dowry (Rs.)	1598	881	3451	73	-1853	901.66**
Number Children	2.92	881	2.10	73	0.82	0.216**
Sex Ratio (daughter : son)	1.11	881	1.08	73	0.02	0.129
Own Land (%)	0.02	881	0.00	73	0.02	0.017
Own Family's Land (acres)	2.59	881	1.31	73	1.28	1.178

Significance of difference in means: + p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.

Figure 5. Reform's Marginal Impact, Conditional on Local Official's Level of Accountability to Women

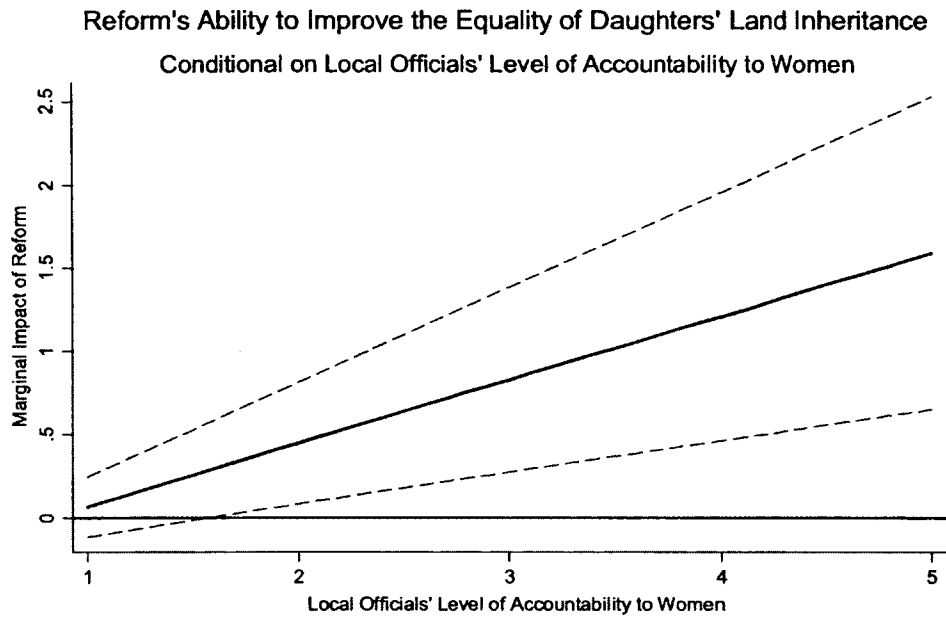
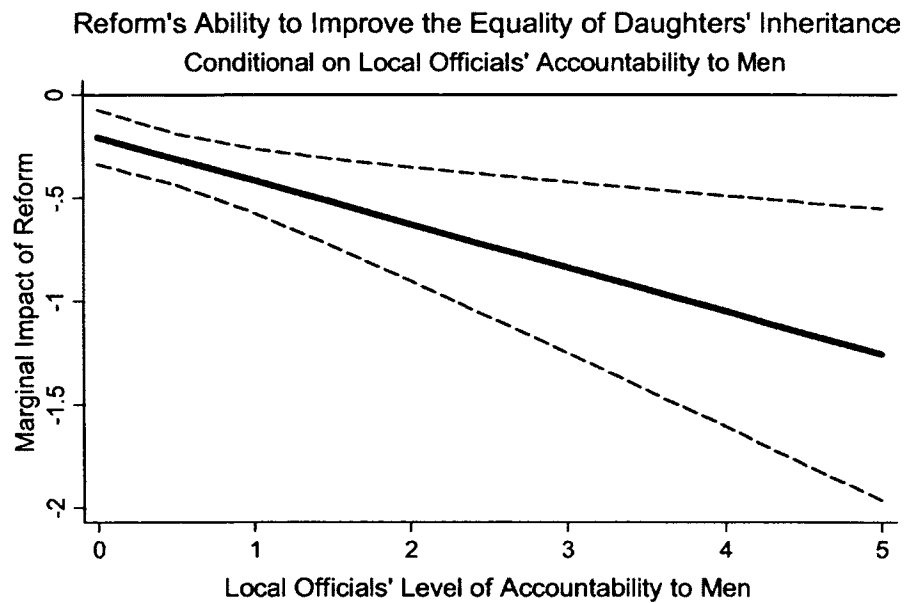


Figure 6. Descriptive Statistics: Females at the Tri-state Border,
IHDS 2005 and REDS 2006/8

Variable	IHDS 2005				REDS 2006/08			
	N	Mean	SD	Median	N	Mean	SD	Median
Mother Educated	7792	0.647	0.587	1	625	0.346	0.476	0
Father Educated	7772	0.654	0.586	1	394	0.508	0.501	1
Daughter Educated	7746	0.659	0.588	1	509	0.699	0.459	1
Son Educated	7801	0.663	0.583	1	750	0.817	0.387	1
Siblings (No.)	7688	2.368	1.426	2	490	2.992	2.019	3
"Hindu" (Buddhist, Hindu, Jain, Sikh)	7688	0.800	0.400	1	509	0.857	0.351	1
Scheduled Caste	7688	0.190	0.392	0	509	0.193	0.395	0

Comparison: India Human Development Survey 2005 & NCAER's Rural Economic and Demographic Survey 2006/08

Figure 7. Reform's Marginal Impact, Conditional on Local Official's Level of Accountability to Men



Note: Marginal effects are valid for the numeric range of individual perceptions of local's accountability, i.e. between 1 and 5.

Appendices: Paper 2

Table 1. Reform's Impact on the Sex Ratio (Daughters: Sons),
Tri-state Border Comparison Group

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Father Death Post-Reform	0.294 ⁺ (0.163)	0.304 (0.184)	0.544 (0.393)	0.524 (0.399)	0.398 (0.367)	0.484 (0.462)	0.341 (0.418)
Marriage Post-Reform		-0.153 (0.169)	0.508 (0.342)	0.277 (0.337)	0.730 (0.497)	0.795 (0.620)	1.884 ^{**} (0.623)
Reform Applies		-0.321 (0.245)	-1.287⁺ (0.499)	-1.047⁺ (0.501)	-1.617⁺ (0.658)	-1.027 (1.398)	-3.340⁺ (1.664)
Constant	1.017 ^{***} (0.0615)	1.049 ^{***} (0.0620)	1.135 ^{***} (0.230)	1.119 ^{***} (0.245)	0.647 ⁺ (0.351)	0.873 (0.642)	1.064 ⁺ (0.589)
<i>N</i>	618	605	100	100	100	100	100
<i>Reform</i> ±5yrs			Yes	Yes	Yes	Yes	Yes
<i>Controls</i>				Yes	Yes	Yes	Yes
<i>State FE</i>					Yes	Yes	Yes
<i>BirthYearFE</i>							
adj. <i>R</i> ²	0.014	0.016	0.003	-0.009	0.004	-0.220	-0.179

Robust standard errors clustered at the village level in parentheses: ⁺ $p < 0.10$, ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$. "Reform applies" refers to the interaction of "Father Death Post-Reform" & "Marriage Post-Reform" indicator variables.

Table 2: Reform's impact on the Sex Ratio (Daughters:Sons),
All states

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
FatherDeath	0.0757	0.0894	0.112	0.127	0.208 ⁺	0.122	0.205 ⁺
Post-Reform	(0.0601)	(0.0652)	(0.0857)	(0.0838)	(0.112)	(0.0824)	(0.107)
Marriage		-0.0720	-0.105	-0.0583	-0.0320	-0.0350	-0.0125
Post-Reform		(0.0741)	(0.180)	(0.184)	(0.209)	(0.229)	(0.252)
Reform		-0.0749	-0.0449	-0.0539	-0.0490	-0.0958	-0.0687
Applies		(0.140)	(0.277)	(0.283)	(0.290)	(0.324)	(0.336)
Constant	1.124 ^{***}	1.126 ^{***}	1.105 ^{***}	0.976 ^{***}	1.270 ^{***}	0.862 ^{***}	1.168 ^{***}
	(0.0175)	(0.0179)	(0.0288)	(0.0544)	(0.156)	(0.0778)	(0.169)
<i>N</i>	9075	9064	2560	2560	2560	2559	2559
<i>Reform±5yrs</i>			Yes	Yes	Yes	Yes	Yes
<i>Controls</i>				Yes	Yes	Yes	Yes
<i>State FE</i>					Yes		Yes
<i>BirthYearFE</i>						Yes	Yes
adj. <i>R</i> ²	0.000	0.000	0.001	0.005	0.010	-0.001	0.003

OLS Regressions. Robust standard errors in parentheses: ⁺ $p < 0.10$, ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$. Standard errors are clustered at the village level. The sample includes Hindu landholding families where adult's fathers passed away from all 17 states in REDS. "Reform applies" refers to the interaction of "Father Death Post-Reform" & "Marriage Post-Reform" indicator variables. "Reform ±5yrs" refers to the subsample of families whose fathers pass away within five years before/after reform. "Time fixed effects" refer to fixed effects for the year of father's birth. Controls include: membership in a Scheduled Caste (Y/N), dowry (Rs.), years of schooling, and the number of daughters in the natal family.

Table 3. Reform's Impact on the Sex Ratio, Treatment based on Grandfather's Death, Tri-state Border Comparison Group

	(1)	(2)	(3)	(4)	(5)	(6)
Grandfather Death PR	-0.0459 (0.0508)	0.373 (0.383)	0.371 (0.382)	0.383 (0.394)	0.476 ⁺ (0.268)	0.479 ⁺ (0.268)
Marriage PostReform		-0.138 (0.0797)	-0.113 (0.0885)	-0.114 (0.0877)	-0.172 (0.125)	-0.170 (0.116)
Reform Applies		-0.381 (0.374)	-0.389 (0.369)	-0.398 (0.381)	-0.464⁺ (0.224)	-0.473⁺ (0.228)
Constant	1.055 ^{***} (0.0471)	1.127 ^{***} (0.0711)	1.016 ^{***} (0.110)	1.070 ^{***} (0.177)	1.044 ^{***} (0.135)	1.045 ^{***} (0.127)
<i>N</i>	222	216	216	216	216	216
<i>Controls</i>		Yes	Yes	Yes	Yes	Yes
<i>State FE</i>				Yes		Yes
<i>Time FE</i>					Yes	Yes
adj. <i>R</i> ²	-0.003	0.000	0.004	-0.004	0.057	0.048

OLS Regressions. Robust standard errors in parentheses: ⁺ $p < 0.10$, ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$. Standard errors are clustered at the village level. The sample includes Hindu landholding families, based on grandfathers' landholding status, where grandfathers passed away from borders of 3 reformer states in REDS: Andhra Pradesh, Tamil Nadu & Karnataka (Chittoor, Anantpur, Raichur, Bellary, Bangalore & Bangalore Rural, Chitradurga, Kolar, Chennai, Vellur, Kancheepuram). "Reform applies" refers to the interaction of "Grandfather Death Post-Reform" & "Marriage Post-Reform" indicator variables. "Time fixed effects" refer to fixed effects for the year of father's birth. Control: Number of sisters in woman's natal family.

Table 4. Reform's Indirect Impact, Sons' Care for Elder Parents,
Tri-State Border Comparison Group

	(1)	(2)	(3)	(4)	(5)
Reform Applies	0.176 (0.111)	0.545** (0.158)	0.546** (0.158)	0.554* (0.257)	0.596*** (0.154)
Any Daughters		0.0590 (0.164)	-0.108 (0.186)	0.000542 (0.279)	0.0382 (0.169)
Reform applies *Daughters		-0.452* (0.190)	-0.456* (0.188)	-0.444 (0.277)	-0.523** (0.173)
Constant	0.500*** (0.0807)	0.455** (0.158)	0.383* (0.170)	0.907*** (0.0824)	0.0433 (0.137)
<i>N</i>	82	82	82	82	82
<i># Siblings</i>			Yes	Yes	Yes
<i>Parent</i>			Yes	Yes	Yes
<i>Land</i>				Yes	
<i>Time FE</i>					Yes
<i>State FE</i>					
adj. R^2	0.019	0.035	0.058	-0.115	0.263

Robust standard errors clustered at the village level in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, **** $p < 0.001$. The sample is restricted to male household heads in the four states with early amendments to the Hindu Succession Act who are only sons with at least one surviving parent above age 60 at the time of the REDS 2006/2008 survey round. "Reform applies" is a dummy variable that refers to the prior household head's death post-reform vs. pre-reform. "Any daughters" is a dummy variable indicating whether or not the male household head has sisters. "Time" fixed effects refer to year of birth fixed effects, which control for time trends in sons' care of elder parents. "State" fixed effects indicate fixed effects for an individual's state of residence, which account for the influence of geographic trends based on states' formal institutions (which dictate the timing of reform and the nature of its implementation) and informal institutions (dependent on state-specific spatial concentrations of linguistic communities) on sons' care for elder parents.

Table 5. Reform's Indirect Impact, Sons' Care for Elder Parents,
All States

	(1)	(2)	(3)	(4)	(5)
Reform	-0.0239	0.377***	0.379***	0.358***	0.589***
Applies	(0.0864)	(0.0573)	(0.0575)	(0.0827)	(0.120)
Any Daughters		0.106 (0.0638)	0.0512 (0.0900)	0.105 (0.0939)	0.126 (0.0889)
Reform* Daughters		-0.498*** (0.114)	-0.512*** (0.114)	-0.523*** (0.138)	-0.523*** (0.129)
Constant	0.700*** (0.0315)	0.623*** (0.0573)	0.593*** (0.0608)	0.997*** (0.126)	0.0748 (0.117)
<i>N</i>	291	291	291	291	291
adj. <i>R</i> ²	-0.003	0.012	0.016	0.025	0.125

Robust standard errors clustered at the village level in parentheses: † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. The sample is restricted to male household heads across all 17 REDS states who are only sons with at least one surviving parent above age 60 at the time of the REDS 2006/8 survey round. "Reform applies" is an indicator variable that takes a value of one if the prior household head passed away post-reform in a "reformer state" which amended national inheritance law, and takes a value of zero otherwise. "Any Daughters" is an indicator variable that takes a value of one if the prior head had any daughters (or equivalently, if the current male household head has any sisters). Controls are: the total number of siblings in a given household (sons and daughters) and the acreage of land held by the parents. State fixed effects indicate fixed effects for an individual's state of residence, which account for the influence of geographic trends based on states' formal institutions (which dictate the timing of reform and the nature of its implementation) and informal institutions (dependent on state-specific spatial concentrations of linguistic communities) on sons' willingness to care for elder parents in the presence vs. absence of daughters. "Time" fixed effects refer to year of birth fixed effects, which control for time trends in sons' willingness and ability to care for elder parents in the presence vs. absence of daughters.

Table 6. Reform's Indirect Impact, Daughters' Relative Survival Rate, *Tri-State Border Comparison Group*

	(1)	(2)	(3)	(4)	(5)
Father Death Post-Reform	0.0047 (0.0396)	-0.0155 (0.0587)	0.0496* (0.0243)	0.0829 (0.0590)	0.0898 (0.0585)
Marriage PostReform		0.0817* (0.0368)	0.0894* (0.0388)	0.0423 (0.0359)	0.0389 (0.0346)
Reform Applies		-0.0438 (0.0822)	-0.0898 (0.0703)	-0.167* (0.0838)	-0.175* (0.0839)
Constant	-0.0417** (0.0145)	-0.0433** (0.0144)	-0.0703 (0.0482)	-0.129 (0.0946)	-0.0393 (0.107)
<i>N</i>	347	334	312	312	312
<i>Controls</i>			Yes	Yes	Yes
<i>State FE</i>			Yes		Yes
<i>Time FE</i>				Yes	Yes
adj. R^2	-0.003	-0.003	-0.017	-0.013	-0.022

Robust standard errors clustered at the village level in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, **** $p < 0.001$. The dependent variable is the ratio of daughters' survival rates to sons' survival rates for a family, reported by mothers. "Reform applies" refers to the interaction of "Father Death Post-Reform" & "Marriage Post-Reform" indicator variables. Controls are: mother's education (years of schooling) and mother's landholding status (parents own land: Y/N). "State" fixed effects indicate fixed effects for an individual's state of residence, which account for the influence of geographic trends based on states' formal institutions (which dictate the timing of reform and the nature of its implementation) & informal institutions (dependent on state-specific spatial concentrations of linguistic communities) on child survival rates. "Time" fixed effects refer to year of birth fixed effects, which control for time trends in child survival rates.

Table 7. Reform's Indirect Impact, Daughters' Relative Survival Rate, *All States*

	(1)	(2)	(3)	(4)	(5)	(6)
Patriarch Death PR	0.00134 (0.0285)	0.0654 (0.0960)	0.0713 (0.0941)	0.0769 (0.0842)	0.0706 (0.101)	0.0680 (0.0935)
Marriage Post-Reform		0.0140 (0.0137)	0.0241 ⁺ (0.0134)	0.0224 (0.0229)	0.0164 (0.0132)	0.00852 (0.0238)
Reform Applies		-0.0924 (0.0924)	-0.107 (0.0908)	-0.107 (0.0905)	-0.0986 (0.0971)	-0.0935 (0.0983)
Constant	-0.0212 ^{***} (0.00610)	-0.0219 ^{**} (0.00666)	0.0289 (0.0232)	0.0691 (0.0468)	0.0614 [*] (0.0263)	0.0777 (0.0539)
<i>N</i>	2852	2763	2523	2523	2523	2523
<i>Controls</i>			Yes	Yes	Yes	Yes
<i>State FE</i>				Yes		Yes
<i>Time FE</i>					Yes	Yes
adj. R^2	-0.000	0.000	0.005	0.009	0.020	0.023

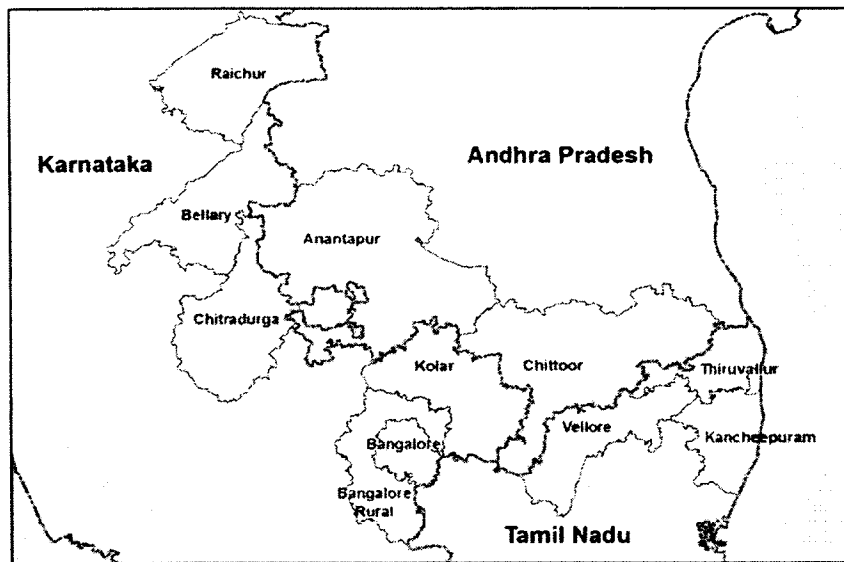
Robust standard errors clustered at the village-level in parentheses: ⁺ $p < 0.10$, ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$. The dependent variable is the difference between daughters' and sons' survival rates for a family, reported by mothers. "Patriarch Death PR" refers to the death of a given child's father or grandfather post-reform (Y/N). "Reform applies" refers to the interaction of "Patriarch Death Post-Reform" & "Marriage Post-Reform" indicator variables. Controls are: mother's education (years of schooling) and the level of landholdings for the household where children reside (reported by the head), where 0 represents none (a category excluded from this analysis), 1 represents ≤ 2 acres, and 2 represents > 2 acres. "State" fixed effects indicate fixed effects for an individual's state of residence, which account for the influence of geographic trends based on states' formal institutions (which dictate the timing of reform and the nature of its implementation) and informal institutions (dependent on state-specific spatial concentrations of linguistic communities) on gender-specific child survival rates. "Time" fixed effects refer to year of birth fixed effects, which control for time trends in child survival rates.

Table 8. Reform's Impact on Daughter's Monetary Dowry (Rs),
Tri-State Border Comparison Group

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Landed	-2651.5	4433.3	3607.9	1555.9	9988.5	-417.6	2530.4
Gr.father	(2964)	(2898)	(2847)	(2097)	(6586)	(3968)	(6258)
Marriage		12496*	15600*	14882 ⁺	17913*	22789***	24408***
PostReform		(5072)	(6739)	(6783)	(7111)	(3856)	(3241)
Marriage		-7611	-8684	-7476	-11157	-10961*	-12233*
PR *Land		(6585)	(6739)	(6282)	(8774)	(3955)	(4082)
Grandfather			-1751.0	-7351.4	812.3	-3361.1	617.6
Death PR			(1443)	(6288)	(7288)	(8656)	(11810)
Gr. Death			2317.1	8795.4	3401.4	-17110.5	-22427.4
PR*Land			(2844)	(5161)	(7568)	(16536)	(16651)
Reform			-10541 ⁺	-7275 ⁺	-13376 ⁺	-14541	-16767
Applies			(5559)	(3391)	(6753)	(10533)	(11064)
Reform			4945	1189	7141	38997*	41788*
Appl *Land			(6549)	(6242)	(8854)	(14642)	(16156)
Mother's				1609.6	1864.9	526.0	1046.0
Educ.(yrs)				(2257)	(2012)	(1432)	(1528)
Constant	11890.3*	1047.8	1826.0	3000.0 ⁺	-6071.4	28889.2*	36413.5**
	(5021)	(774)	(1426)	(1521)	(6132)	(11523)	(8608)
<i>N</i>	154	145	144	141	141	141	141
<i>State FE</i>					Yes		Yes
<i>Time FE</i>						Yes	Yes
adj. <i>R</i> ²	-0.001	0.025	0.051	0.061	0.221	0.383	0.432

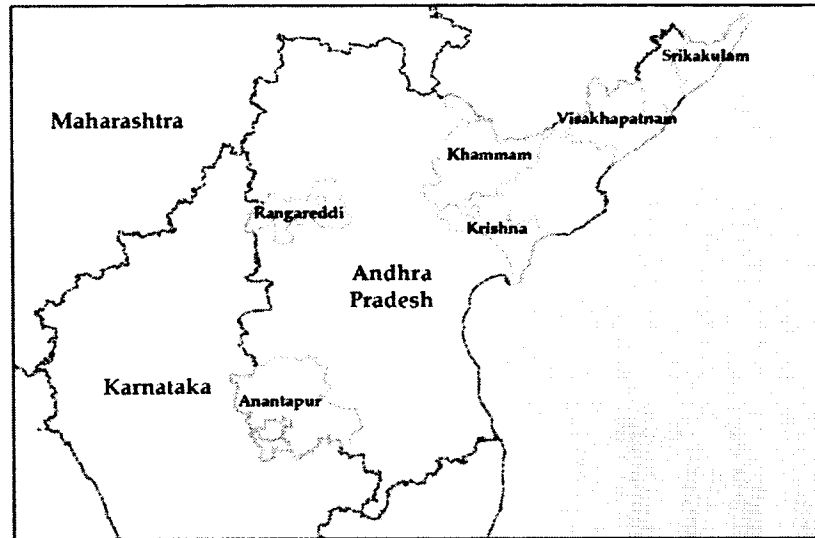
OLS Regressions. Robust standard errors in parentheses: ⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors are clustered at the village level. The sample includes daughters from Hindu families where grandfathers passed away from borders of 3 reformer states in REDS: Andhra Pradesh, Tamil Nadu & Karnataka (Chittoor, Anantpur, Raichur, Bellary, Bangalore & Bangalore Rural, Chitradurga, Kolar, Chennai, Vellur, Kancheepuram). "Reform applies" refers to the interaction of "Grandfather Death Post-Reform", "Marriage Post-Reform" & "Landholding Grandfather" indicator variables. "Time fixed effects" refer to fixed effects for the year of father's birth.

Figure 1. District Map of Border Districts at Tri-state Intersection.



Data sample drawn from districts at the intersection of three south Indian state borders: Andhra Pradesh, Karnataka, and Tamil Nadu according to the population sample in NCAER's REDS 2006/8 round.

Figure 2. Qualitative Interview Districts, Andhra Pradesh State



Map of Andhra Pradesh, India, using Census of India, 2001 political boundaries.

Figure 3. Descriptive Statistics: Females at the Tri-state Border,
REDS 2006/08

Variable	Non-Treated		Treated		Difference	
	mean	N	mean	N	mean	s.e.
Mother's Education (Yrs)	0.31	880	0.49	73	-0.19	0.168
Father's Education (Yrs)	0.82	880	0.82	73	-0.00	0.268
Number Siblings	5.80	881	5.44	73	0.36	0.268
Parents Own Land (%)	0.63	881	0.35	73	0.28	0.059***
Parents' Land (acres)	6.82	859	2.85	71	3.97	3.521
Marriage Year	1975	865	1994	73	-19.27	8.006***
Father Alive (%)	0.19	881	0.03	73	0.16	0.046***
"Hindu" (Legal Subject)	1.00	881	1.00	73	-0.00	0.006
Scheduled Caste	0.14	881	0.27	73	-0.14	0.043*
Scheduled Tribe	0.19	881	0.10	73	0.09	0.047*
Own Education (Yrs)	2.37	881	4.95	73	-2.57	0.436***
Dowry (Rs.)	1598	881	3451	73	-1853	901.66**
Number Children	2.92	881	2.10	73	0.82	0.216**
Sex Ratio (daughters: sons)	1.11	881	1.08	73	0.02	0.129
Own Land (%)	0.02	881	0.00	73	0.02	0.017
Own Family's Land (acres)	2.59	881	1.31	73	1.28	1.178

Significance of difference in means: + p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001.

Figure 4. Females at the Tri-State Border, Organized by Father's Death Pre- vs. Post-Reform

Variable	Pre-reform		Post-reform		Difference	
	mean	n	mean	n	mean	s.e.
Mother's Education	0.25	491	0.38	447	-0.13	0.089
Father's Education	0.88	491	0.75	447	0.13	0.142
Number Siblings	6.03	491	5.62	448	0.41	0.268**
Landed Parents (%)	0.64	491	0.60	448	0.04	0.032
Parents' Land (acr)	6.97	491	5.44	448	1.53	1.849
Marriage Year	1973	483	1979	440	0.04	0.032
Father Alive (%)	0.03	491	0.02	448	0.01	0.01
"Hindu" (Legal Subject)	0.80	491	0.85	448	-0.04	0.025+
Scheduled Caste	0.13	491	0.16	448	-0.02	0.023
Scheduled Tribe	0.21	491	0.16	448	0.05	0.025*
Own Education (Yrs)	2.14	491	2.98	448	-0.84	0.235***
Dowry (Rs.)	1917.23	491	1591.54	448	325.70	488.37
Number Children	2.79	491	2.94	448	-0.15	0.117
Sex Ratio (g:b)	1.02	491	1.21	448	-0.19	0.069**
Own Land (%)	0.02	491	0.02	448	0.00	0.009
Family Land (acres)	2.84	491	2.10	448	0.74	0.635

Significance of difference in means: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Figure 5. Descriptive Statistics: All Females, *REDS 2006/8*

Variable	Non-Treated		Treated		Difference	
	<u>mean</u>	<u>n</u>	<u>mean</u>	<u>n</u>	<u>mean</u>	<u>s.e.</u>
Mother's Education (Yrs)	0.42	14962	0.59	286	-0.16	0.091⁺
Father's Education (Yrs)	1.37	14962	1.08	286	0.29	0.170⁺
Number Siblings	5.73	14963	5.14	286	0.59	0.135[*]
Parents Own Land (%)	0.67	14963	0.36	286	0.31	0.028^{***}
Parents' Land (acres)	6.92	14275	4.1	281	2.81	1.028^{**}
Marriage Year	1971	14599	1995	286	-23.57	5.612 ^{***}
Father Alive (%)	0.16	14963	0	286	0.16	0.022 ^{***}
"Hindu" (Legal Subject)	0.99	14963	0.99	286	0	0.006
Scheduled Caste	0.16	14963	0.2	286	-0.05	0.022 [*]
Scheduled Tribe	0.08	14963	0.04	286	0.04	0.016 [*]
Own Education (Yrs)	2.39	14963	5.75	286	-3.36	0.218 ^{***}
Dowry (Rs.)	1077	14963	5890	286	-4813	257.39 ^{***}
Number Children	2.82	14963	1.99	286	0.83	0.117 ^{***}
Sex Ratio (daughter: son)	1.12	14962	1.06	286	0.06	0.061
Own Land (%)	0.03	14963	0.01	286	0.02	0.010 ⁺
Own Family's Land (acres)	2.95	14963	0.88	286	2.07	3.436

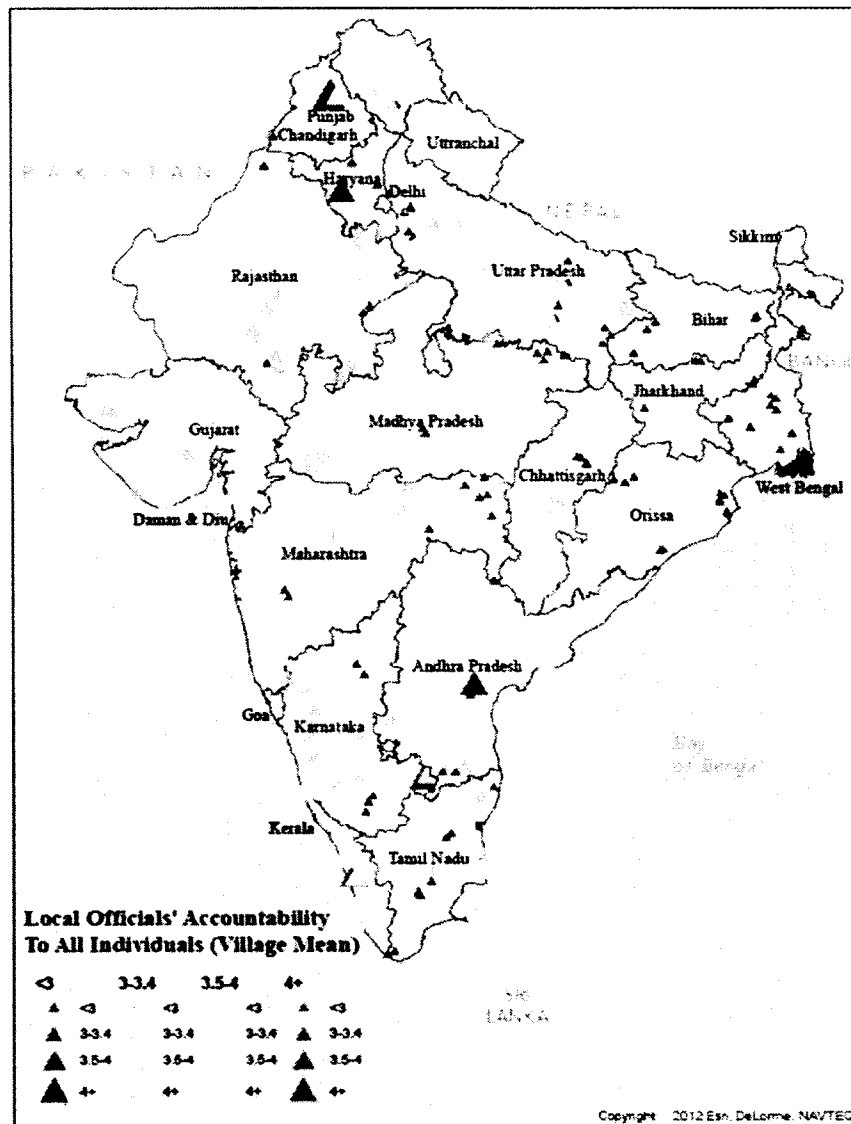
Significance of difference in means: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Figure 6. Descriptive Statistics: Females at the Tri-State Border,
India Human Development Survey 2005 vs. Rural Economic &
Demographic Survey 2006/08

Variable	IHDS 2005				REDS 2006/08			
	N	Mean	SD	Median	N	Mean	SD	Median
Mother Educated	7792	0.647	0.587	1	625	0.346	0.476	0
Father Educated	7772	0.654	0.586	1	394	0.508	0.501	1
Daughter Educated	7746	0.659	0.588	1	509	0.699	0.459	1
Son Educated	7801	0.663	0.583	1	750	0.817	0.387	1
Siblings (No.)	7688	2.368	1.426	2	490	2.992	2.019	3
"Hindu" (Buddhist, Hindu, Jain, Sikh)	7688	0.800	0.400	1	509	0.857	0.351	1
Scheduled Caste	7688	0.190	0.392	0	509	0.193	0.395	0

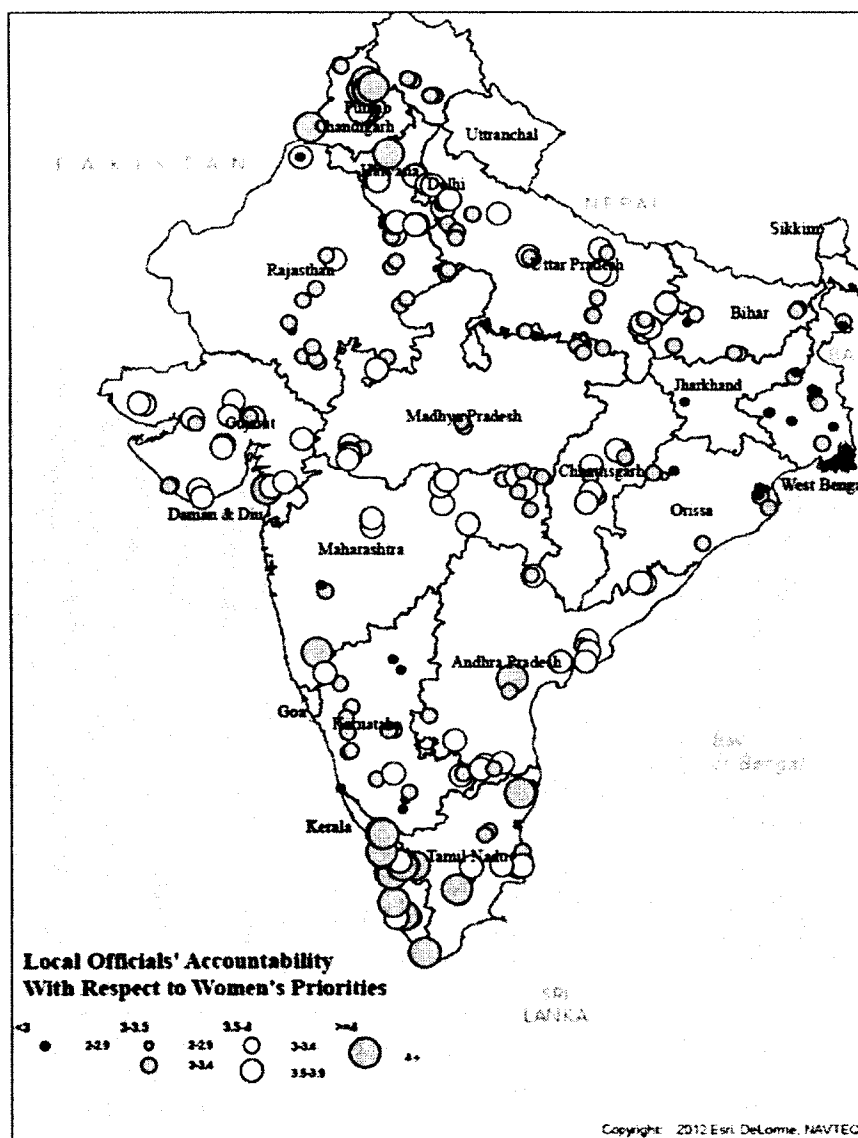
Appendices: Paper 3

Figure 1. Geospatial Trends in Local Officials' General Accountability, Village-level Averages



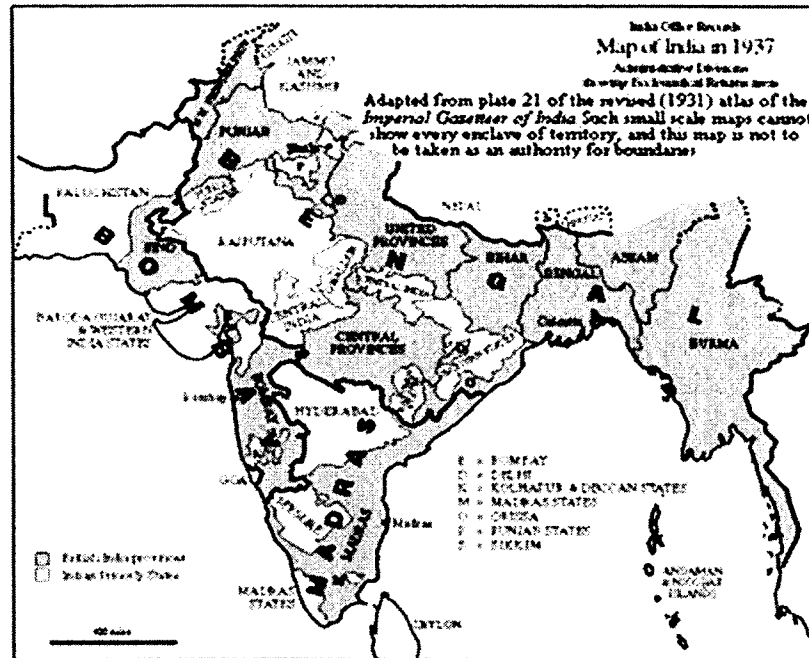
Note: Himachal Pradesh is the single unlabeled state with observations recorded in the far North.

Figure 2. Geospatial Trends in Local Officials' Accountability,
With Respect to Women's Priorities; Village-level Averages



Note: Himachal Pradesh is the single unlabeled state with observations recorded in the far North.

Figure 3. Map of Colonial Provinces, British India, 1937



Source: <http://www.findmypast.co.uk/assets/img/content/india-districts-map.jpg>

Figure 4. Variation in Colonial Land Tenure Systems

Independent States (Main)	Colonial Province (Approximate)	Colonial Land Tenure System
Jammu & Kashmir	North West Provinces	Village-based (<i>lambardari</i>)
Punjab	Panjab	Village-based (<i>lambardari</i>)
Haryana	Panjab	Village-based (<i>lambardari</i>)
Uttar Pradesh	United Provinces	Large landlords (<i>talukdari</i>)
Bihar	Bengal Presidency	Large landlords (<i>zamindari</i>)
West Bengal	Bengal Presidency	Large landlords (<i>zamindari</i>)
Orissa	Bengal Presidency & Madras Presidency= 2 districts	Large landlords (<i>zamindari</i>) & Individual taxation (<i>ryotwari</i>), 2 districts
Madhya Pradesh	Central Provinces	Large landlords (<i>malguzari</i>)
Rajasthan	Princely States (Rajputana)	Royal grants (<i>jagirdari</i> & <i>muafi</i>)
Gujarat	Bombay Presidency & Princely States (Baroda, Kutch, etc.)	Individual taxation (<i>ryotwari</i>) [& Royal grants in Princely States?]
Andhra Pradesh	Madras Presidency & Princely State (Hyderabad)	Individual taxation (<i>ryotwari</i>) & Royal grants (<i>inamdari</i>)
Maharashtra	Bombay Presidency	Individual taxation (<i>ryotwari</i>)
Karnataka	Madras Presidency & Princely States (Hyderabad, Mysore)	Individual taxation (<i>ryotwari</i>) & Royal grants (<i>inamdari</i>)
Tamil Nadu	Madras Presidency & tiny Princely States (Pudukkottai)	Individual taxation (<i>ryotwari</i>)
Kerala	Madras Presidency & Princely States (Cochin, Malabar, Travancore)	Individual taxation (<i>ryotwari</i>) & State-managed individual taxation (on <i>circar</i> or <i>pandaravaka</i> lands)

Figure 5. Histogram : Perceptions of Local Officials' Accountability with Respect to Women's Priorities

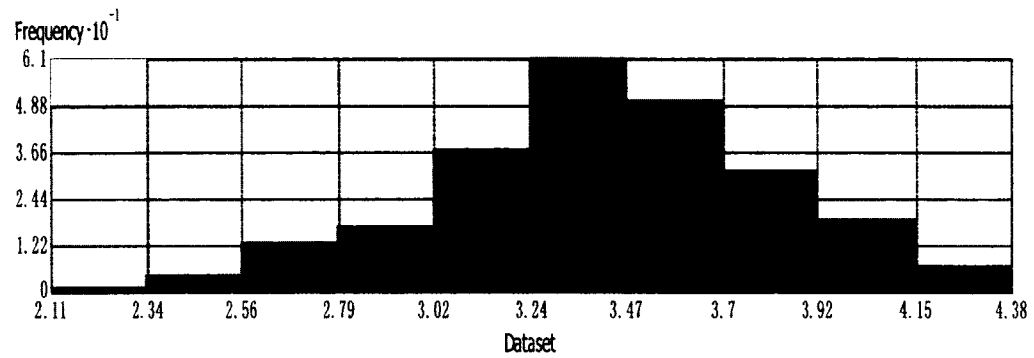


Figure 6. Geospatial Trends in Local Officials' Accountability to Women

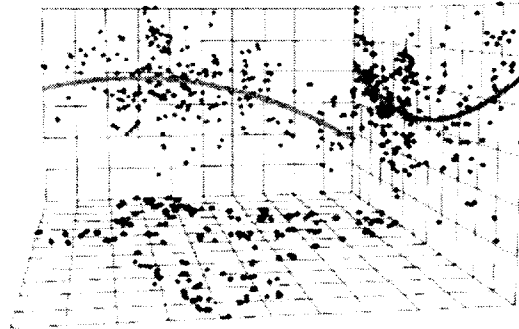
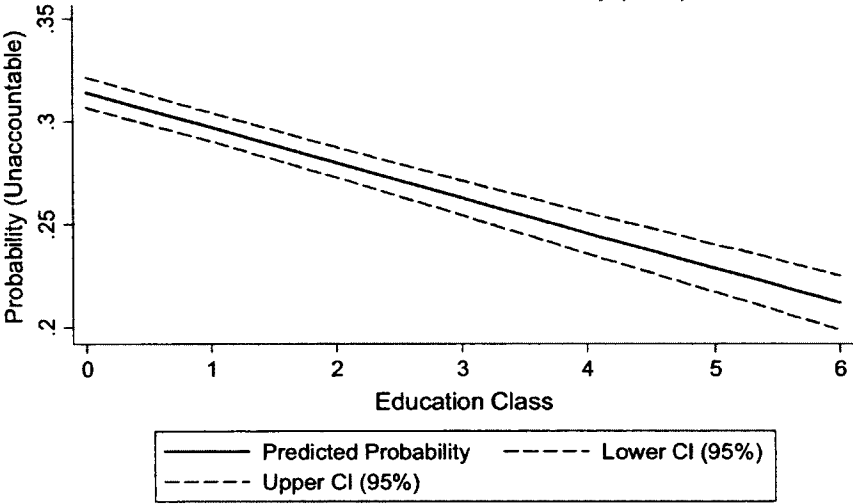


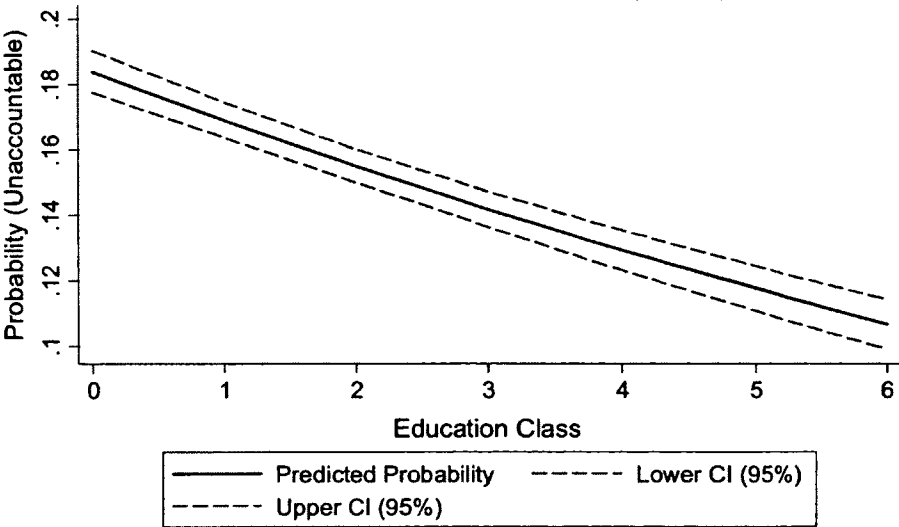
Figure 7. Simulations: Local Officials' General Accountability, *Variation by Education and Sex*

Probability Local Officials are Highly Unaccountable to Women
General Measure of Accountability (Pr=2)



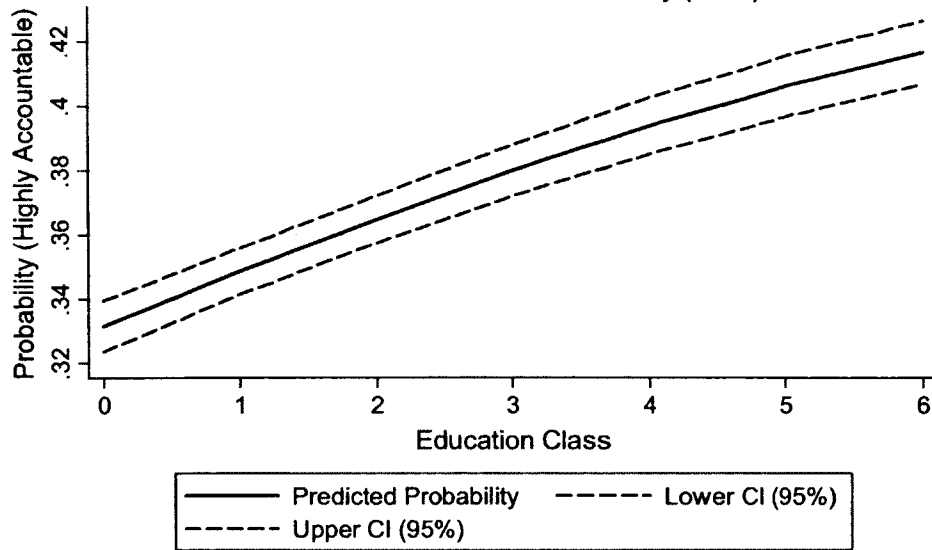
Education Class: 0=None; 1=Primary; 2=Secondary; 3=Higher Secondary; 4=College/drop; 5=College; 6=PostGrad

Probability Local Officials are Highly Unaccountable to Men
General Measure of Accountability (Pr=2)



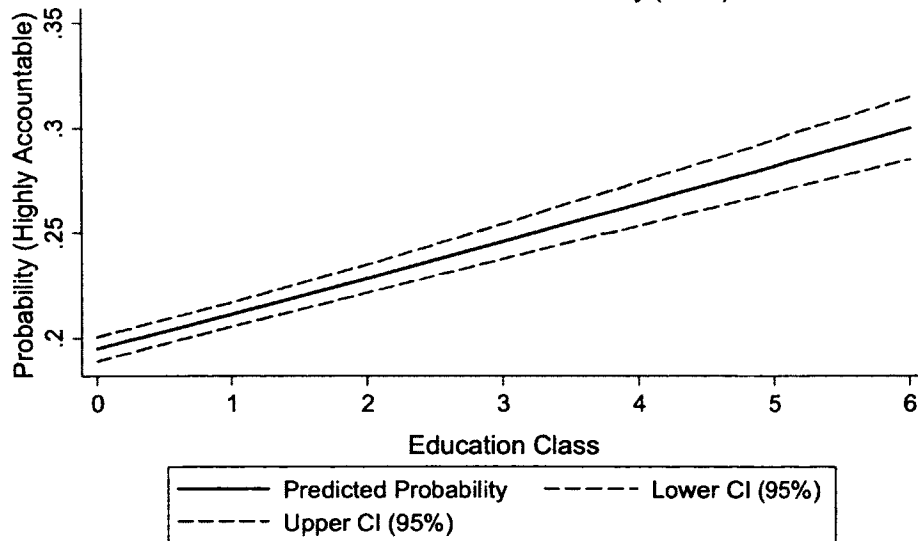
Education Class: 0=None; 1=Primary; 2=Secondary; 3=Higher Secondary; 4=College/drop; 5=College; 6=PostGrad

Probability Local Officials are Highly Accountable to Men
 General Measure of Accountability (Pr=4)



Education Class: 0=None; 1=Primary; 2=Secondary; 3=Higher Secondary; 4=College/drop; 5=College; 6=PostGrad

Probability Local Officials are Highly Accountable to Women
 General Measure of Accountability (Pr=4)



Education Class: 0=None; 1=Primary; 2=Secondary; 3=Higher Secondary; 4=College/drop; 5=College; 6=PostGrad

Figure 8. Simulations: Local Officials' Accountability with Respect to Women's Priorities, *Variation by Education & Sex*

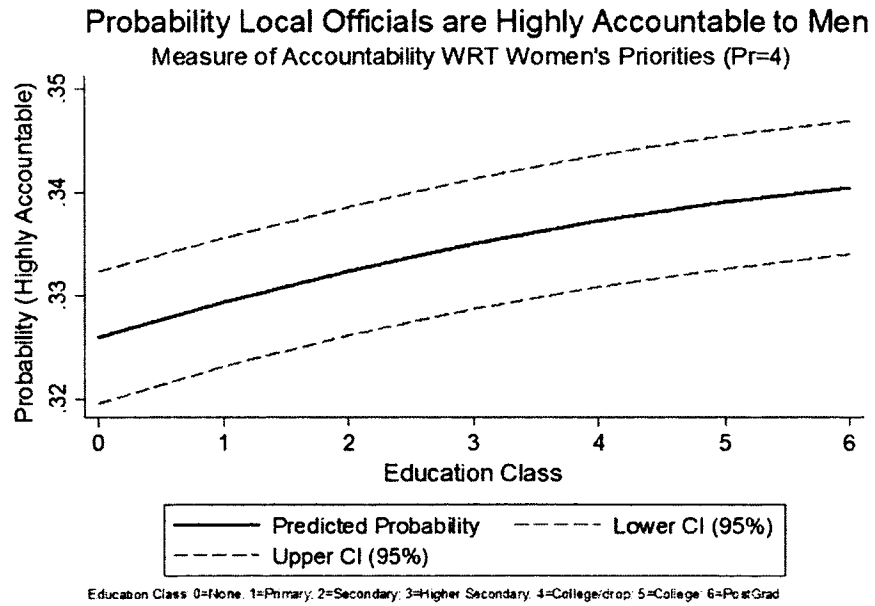
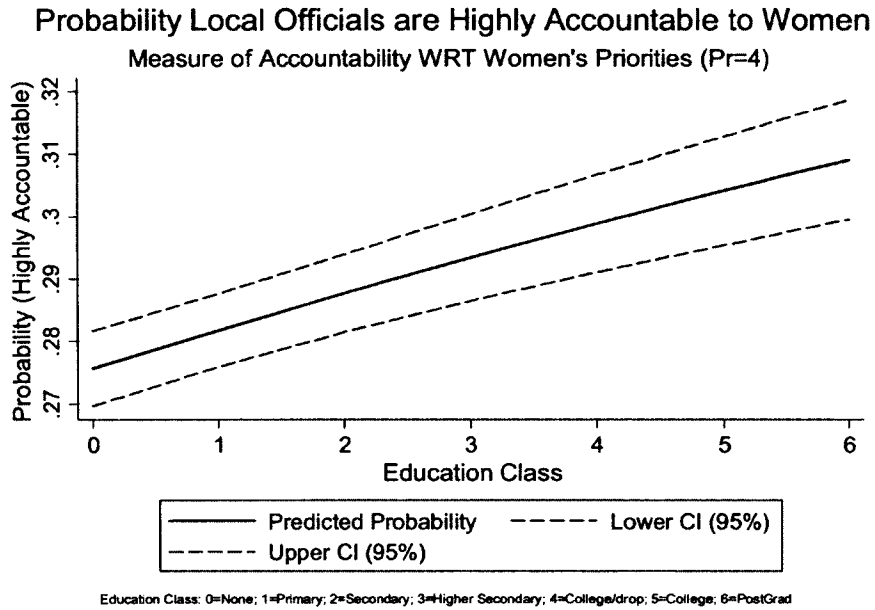


Figure 9. Simulations: Local Officials' Accountability with Respect to Women's Priorities, *Variation by Women's Migration*

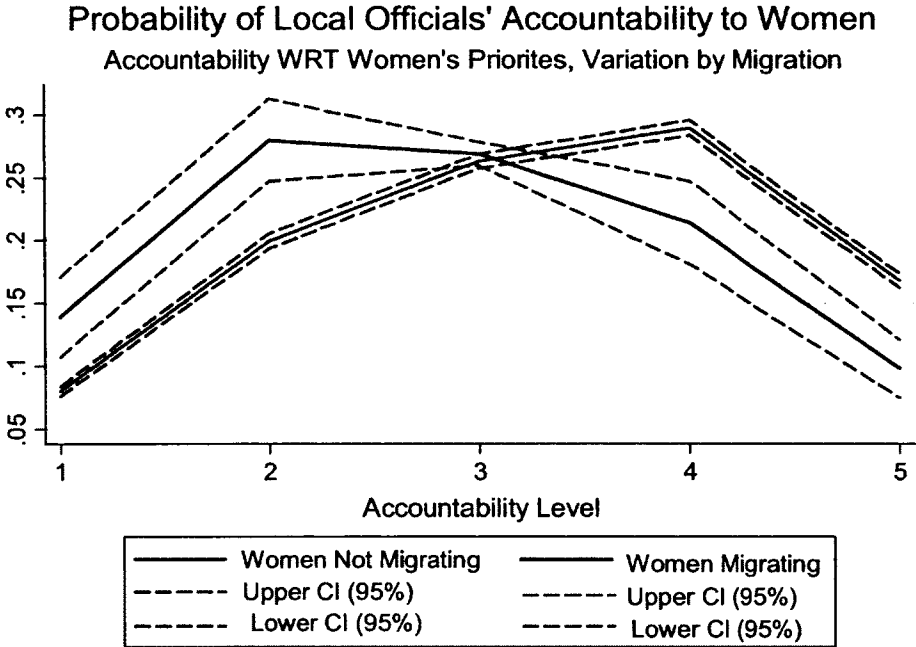


Figure 10. Simulations: Local Officials' General Accountability, *Conditional on Varied Experience with Reservations*

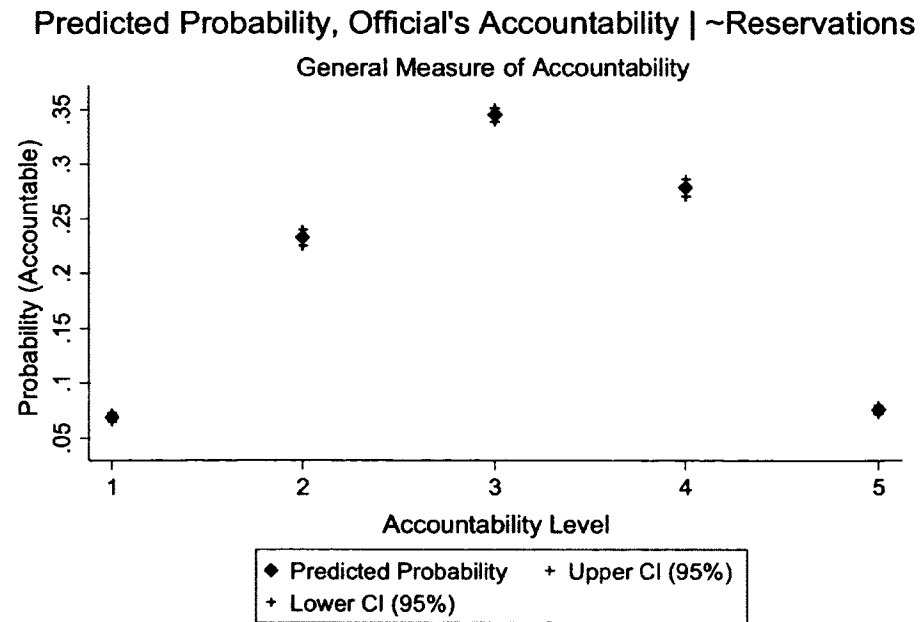
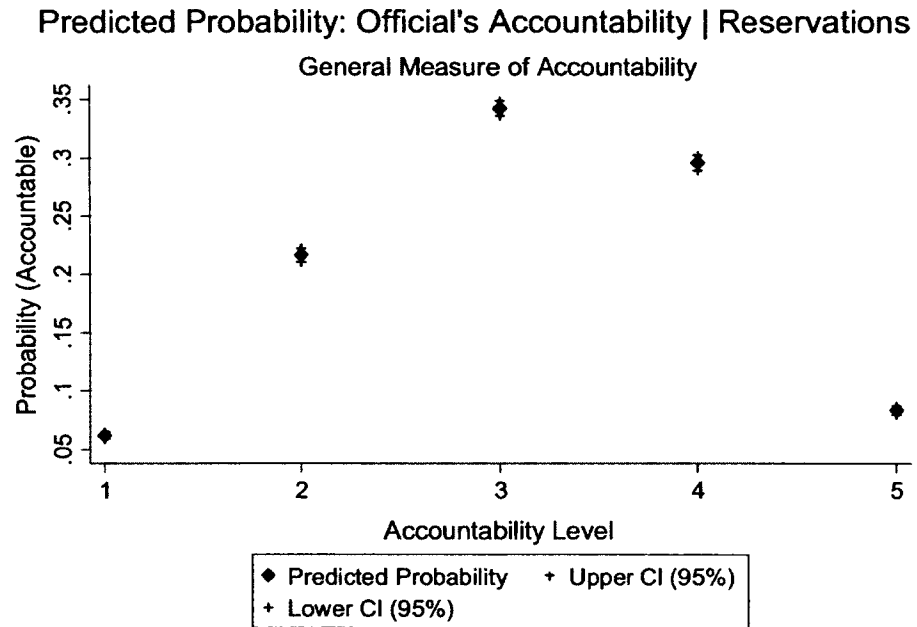


Table 1. Variation in Officials' Accountability to All Individuals,
Individual Characteristics

	(1)	(2)	(3)	(4)	(5)
Female	-0.992^{***} (0.023)	-0.881^{***} (0.024)	-0.882^{***} (0.024)	-0.843^{***} (0.026)	-0.938^{***} (0.025)
Education		0.145^{***} (0.009)	0.144^{***} (0.009)	0.143^{***} (0.009)	0.124^{***} (0.009)
Age		0.007^{***} (0.001)	0.007^{***} (0.001)	0.006^{***} (0.001)	0.006^{***} (0.001)
Scheduled Caste		-0.012 (0.031)			
Muslim			-0.140 ^{**} (0.045)	-0.131 ^{**} (0.045)	0.051 (0.047)
Migrate				0.433 ^{***} (0.115)	0.138 (0.120)
Own Land				0.153^{***} (0.035)	
Parents Own Land					0.147^{***} (0.025)
cut1					
Constant	-3.136 ^{***} (0.0282)	-2.603 ^{***} (0.0487)	-2.616 ^{***} (0.0485)	-1.764 ^{***} (0.233)	-3.493 ^{***} (0.251)
cut2					
Constant	-1.374 ^{***} (0.0192)	-0.838 ^{***} (0.0445)	-0.851 ^{***} (0.0441)	0.00147 (0.232)	-1.649 ^{***} (0.250)
cut3					
Constant	0.0561 ^{***} (0.0170)	0.601 ^{***} (0.0442)	0.589 ^{***} (0.0438)	1.443 ^{***} (0.232)	-0.122 (0.250)
cut4					
Constant	1.922 ^{***} (0.0238)	2.481 ^{***} (0.0478)	2.470 ^{***} (0.0475)	3.325 ^{***} (0.233)	1.845 ^{***} (0.250)
<i>N</i>	25774	25550	25550	25550	25550
<i>Fixed Effects</i>					Yes
<i>Pseudo R</i> ²	0.0250	0.0289	0.0290	0.0295	0.0579

Robust standard errors in parentheses clustered at the village level: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, **** $p < 0.001$. Column 5 includes fixed effects for individuals' state of residence.

Table 2. Variation in Officials' Accountability to Women,
Individual Characteristics

	(1)	(2)	(3)	(4)	(5)
Female	-0.566^{***} (0.022)	-0.505^{***} (0.023)	-0.503^{***} (0.023)	-0.456^{***} (0.025)	-0.553^{***} (0.024)
Education		0.075^{***} (0.009)	0.079^{***} (0.009)	0.078^{***} (0.009)	0.055^{***} (0.009)
Age		0.006^{***} (0.001)	0.006^{***} (0.001)	0.005^{***} (0.001)	0.004^{***} (0.001)
Scheduled Caste		-0.117^{***} (0.031)			
Muslim			0.083 ⁺ (0.050)	0.095 ⁺ (0.050)	0.162 ^{**} (0.051)
Migrate				0.608^{***} (0.134)	0.409^{**} (0.133)
Own Land				0.187^{***} (0.035)	
Parents Own Land					0.054⁺ (0.024)
cut1					
Constant	-2.934^{***} (0.028)	-2.583^{***} (0.048)	-2.546^{***} (0.048)	-1.347^{***} (0.270)	-2.924^{***} (0.275)
cut2					
Constant	-1.444^{***} (0.019)	-1.088^{***} (0.044)	-1.052^{***} (0.044)	0.149 (0.269)	-1.391^{***} (0.275)
cut3					
Constant	-0.329^{***} (0.017)	0.029 (0.043)	0.065 (0.043)	1.266^{***} (0.269)	-0.225 (0.274)
cut4					
Constant	1.097^{***} (0.019)	1.457^{***} (0.044)	1.492^{***} (0.044)	2.696^{***} (0.269)	1.272^{***} (0.275)
<i>N</i>	25833	25607	25607	25607	25607
<i>Fixed Effects</i>					Yes
<i>Pseudo R²</i>	0.0082	0.0097	0.0096	0.0103	0.0315

Robust standard errors in parentheses clustered at the village level: ⁺ $p < 0.10$, ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$. Column 5 includes fixed effects for individuals' state of residence.

Table 3. Variation in Accountability to All Individuals

	(1)	(2)	(3)	(4)	(5)
Education Level	0.0645^{***} (0.00478)	0.0502^{***} (0.00509)	0.0502^{***} (0.00509)	0.0497^{***} (0.00524)	0.0458^{***} (0.00535)
Female	-0.526^{***} (0.0140)	-0.539^{***} (0.0146)	-0.535^{***} (0.0246)	-0.555^{***} (0.0148)	-0.616^{***} (0.0145)
Landed Parents	0.0177 (0.0136)	0.0518^{***} (0.0145)	0.0517^{***} (0.0145)	0.101^{***} (0.0149)	0.108^{***} (0.0151)
Scheduled Caste	-0.0115 (0.0183)	0.0318 ⁺ (0.0190)	0.0317 ⁺ (0.0190)	0.0276 (0.0197)	0.0149 (0.0211)
Muslim	-0.0788 ^{**} (0.0266)	-0.119 ^{***} (0.0292)	-0.119 ^{***} (0.0292)	-0.0186 (0.0302)	-0.0104 (0.0364)
Reservations For Women		0.0742^{***} (0.0147)	0.0773^{***} (0.0212)		
Female* Reservation			-0.00628 (0.0293)		
Log Populatn Village, 2001		0.0969^{***} (0.00766)	0.0969^{***} (0.00766)	0.0423^{***} (0.00954)	
Wealth (Village)		0.00459^{***} (0.000580)	0.00459^{***} (0.000580)	0.00232^{***} (0.000622)	
Nearest Road (Travel/min)		-0.00675^{***} (0.000633)	-0.00675^{***} (0.000633)	-0.00189⁺ (0.000736)	
District HQ (Travel/min)		0.000748 ^{***} (0.000110)	0.000748 ^{***} (0.000110)	0.0000457 (0.000119)	
Win Margin Pradhan, t-1		-0.126^{***} (0.0200)	-0.126^{***} (0.0200)	-0.170^{***} (0.0251)	
Cut1_cons	-1.689 ^{***} (0.0194)	-0.910 ^{***} (0.0665)	-0.908 ^{***} (0.0670)	-1.957 ^{***} (0.100)	-2.379 ^{***} (0.0967)
Cut2_cons	-0.715 ^{***} (0.0168)	0.0672 (0.0660)	0.0691 (0.0666)	-0.939 ^{***} (0.0998)	-1.253 ^{***} (0.0960)
Cut3_cons	0.164 ^{***} (0.0165)	0.949 ^{***} (0.0661)	0.951 ^{***} (0.0667)	-0.0223 (0.0998)	-0.246 ⁺ (0.0959)
Cut4_cons	1.234 ^{***} (0.0181)	2.034 ^{***} (0.0671)	2.036 ^{***} (0.0677)	1.101 ^{***} (0.100)	0.954 ^{***} (0.0963)
<i>N</i>	25550	23502	23502	23502	25550
<i>Fixed effects</i>				State	Village
<i>Pseudo R</i> ²	0.0279	0.0343	0.0343	0.0577	0.1080

Robust standard errors in parentheses: ⁺ $p < 0.10$, ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$.

Table 4. Variation in Officials' Accountability to Women

	(1)	(2)	(3)	(4)	(5)
Education Level	0.0306^{***} (0.0047)	0.0207^{***} (0.0050)	0.0207^{***} (0.005)	0.0158^{**} (0.0052)	0.00947⁺ (0.0052)
Female	-0.317^{***} (0.0139)	-0.316^{***} (0.0145)	-0.315^{***} (0.0235)	-0.325^{***} (0.0147)	-0.353^{***} (0.0142)
Landed Parents	-0.0349 ⁺ (0.0137)	-0.0069 (0.0145)	-0.0069 (0.0145)	0.0353 ⁺ (0.0151)	0.0433 ^{**} (0.0150)
Scheduled Caste	-0.0819^{***} (0.0185)	-0.0715^{***} (0.0193)	-0.0715^{***} (0.0193)	-0.0536^{**} (0.0197)	-0.0445⁺ (0.0207)
Muslim	0.0317 (0.0291)	-0.0080 (0.0319)	-0.0080 (0.0319)	0.0799 ⁺ (0.0330)	-0.0042 (0.0378)
Reservation For Women		0.0356⁺ (0.0145)	0.0360⁺ (0.0208)		
Female* Reservation			-0.0007 (0.0287)		
Log Populatn Village, 2001		0.0516^{***} (0.0079)	0.0516^{***} (0.0080)	-0.0240⁺ (0.0100)	
Wealth (Village)		0.0044^{***} (0.0007)	0.0044^{***} (0.0007)	0.0017⁺ (0.0007)	
Nearest Road (Travel,min)		-0.0066^{***} (0.0006)	-0.0066^{***} (0.0006)	-0.0017⁺ (0.0007)	
District HQ (Travel,min)		0.0002 ⁺ (0.0001)	0.0002 ⁺ (0.0001)	-0.0000 (0.0001)	
Win Margin Pradhan, t-1		-0.206^{***} (0.0195)	-0.206^{***} (0.0195)	-0.0646^{**} (0.0247)	
Cut1_cons	-1.661 ^{***} (0.0192)	-1.332 ^{***} (0.0690)	-1.332 ^{***} (0.0695)	-2.554 ^{***} (0.101)	-2.269 ^{***} (0.100)
Cut2_cons	-0.858 ^{***} (0.0170)	-0.520 ^{***} (0.0683)	-0.520 ^{***} (0.0688)	-1.723 ^{***} (0.101)	-1.411 ^{***} (0.0999)
Cut3_cons	-0.177 ^{***} (0.0165)	0.164 ⁺ (0.0682)	0.164 ⁺ (0.0687)	-1.019 ^{***} (0.100)	-0.680 ^{***} (0.0997)
Cut4_cons	0.689 ^{***} (0.0169)	1.033 ^{***} (0.0685)	1.033 ^{***} (0.0690)	-0.119 (0.100)	0.250 (0.0997)
<i>N</i>	25607	23545	23545	23545	25607
<i>Fixed Effects</i>				State	Village
adj. <i>R</i> ²	0.0092	0.0142	0.0142	0.0324	0.0506

Robust standard errors in parentheses: ⁺ $p < 0.10$, ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$.

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