Essays on Intra-Household Bargaining Power of Women in India

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Abstract

This thesis investigates the factors that affect women's bargaining power within the household, in India. The first chapter introduces the literature on household bargaining mostly by describing how household outcomes like children's health indicators and expenditure pattern change with increase in resources under women's control. The second chapter describes the conceptual framework for intra-household bargaining. It discusses the two broad topics – household bargaining models and gendered institutions, that can be used to identify avenues for increasing women's bargaining power within the household.

In chapters three and four, I analyze the factors that determine women's power position, using data on women's involvement in household decision making from a nationally representative longitudinal household survey (India Human Development Survey). The survey was conducted in over 40,000 Indian households, which covers over 200,000 individuals.

In the third chapter, I investigate the effect of women's labor force participation on her involvement in household decision making. After addressing the issues of endogeneity using a fixed effects model, I find that her labor market participation significantly increases her involvement in decision making process, which can be seen as a direct outcome of her increased bargaining power.

In my fourth chapter I analyze whether the women's bargaining power within the household increases with the presence of female politicians at both state and local level. Studying the causal impact of a variable like female political representation is generally riddled with concerns of endogeneity for existence of voter preference. Using share of seats won by women in man-woman close elections as an instrument for overall female representation in in a fixed effect model, I show that an increase in number of female state legislators can actually lead to an increase in the bargaining power of women. This chapter further shows that increase in women's involvement in decision making process in the household is also associated with the female political representation at local level.

The fifth chapter concludes the dissertation by making policy recommendation for strengthening women's bargaining position within the household.

General Audience Abstract

This thesis investigates the factors affecting women's bargaining power within the household, in India. The first chapter introduces the literature on household bargaining mostly by discussing papers which find that more resources under the control of women within the household translates into lower fertility, better child health and education outcomes, thus establishing the significance of female bargaining power for overall economic development of countries like India which have poor social indicators. I also discuss some papers which contradict such findings.

The second chapter describes the conceptual framework for the topic of intra-household bargaining. The first part of the chapter discusses the theoretical models of intra-household bargaining. While it is important to understand the theoretical models, it is also important to understand what form household bargaining takes in real life. To understand the power dynamics better, I conducted four Focus Group Discussion (FGD) in the state of West Bengal, India, in 2015. The participants were mostly married women of age 18-50. One of the main observations from the FGDs was that the deep-rooted gender roles for men and women in the society play an important role in determining their positions within the family. Drawing briefly on the observations from the FGD and existing literature on the topic, the second part of chapter two discusses how these gender roles can play a role in determining power position within the household.

In the next two chapters, I analyze the factors that determine women's power position using data on women's involvement in the household decision making. This can be seen as a direct outcome of her bargaining power. The data used has been taken from a nationally representative longitudinal household survey (India Human Development Survey) of over 40,000 Indian households covering more than 200,000 individuals. The survey was conducted in two waves in the years 2004-05 and 2011-12.

In my third chapter I investigate the effect of women's labor force participation on her involvement in household decision making. After addressing the issues of endogeneity using a fixed effects model, I find that her labor market participation significantly increases her involvement in household decision making process.

In my fourth chapter I analyze whether the women's bargaining power within the household increases with the presence of female politicians at both state and local level. Studies, which use female representation in politics to explain various outcome variables, have often pointed out that due to the presence of voter preference it is difficult to estimate the actual causal effect. Hence for state elections, I use the existence of close elections as an instrument in a fixed effect model to show that an increase in number of female state legislators can actually lead to an increase in the bargaining power of women. To instrument for local level female representation, I use mandatory reservation for women in local elections and find a positive association between presence of a female village head and increase in women's involvement in household decision making.

On the basis of the results obtained in this study the fifth chapter concludes the dissertation by making policy recommendation for strengthening women's bargaining position within the household.

Dedicated to

my parents and my husband

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List of Abbreviations

2SLS	Two Stage Least Square
EW	Eligible Women
FE	Fixed Effect
FGD	Focus Group Discussion
IHDS	India Human Development Survey
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MLA	Member of Legislative Assembly
NCAER	National Council of Applied Economic Research
NGO	Non-Governmental Organization
OLS	Ordinary Least Square
PR	Public Representative
SC	Scheduled Caste
ST	Scheduled Tribe
VP	Village Pradhan

Chapter 1

Introduction

Women make up 49.5 percent of the world's population, but are left behind in almost all aspects of life starting with literacy, school enrolment, labor force participation, and other social and economic indicators. Lot of research over the last decade has been done in recognizing the sources and outcomes of discrimination faced by women in all areas of life. A significant effort in capturing the difference between the status of men and women was made by Amartya Sen in 1990, when he defined the concept of 'missing women'. Sen in his classic article in New York Review of Books used the term 'missing women' to capture the gap in the actual and expected number of women in the developing world. Sen calculated the expected number of women using the number of women there would be if they were to die at a rate similar to that in sub-Saharan Africa. Sen attributed the gap between the actual and expected number of women to factors like sex selective abortions, female infanticide, and difference in health care and nutrition received by boy and girl child in Asian countries like India and China. World Bank Indicators, 2012, estimates the missing number of women in the world at 6 million per year of which 23 percent never took birth, 10 percent went missing in early childhood, 21 percent during the reproductive years and 38 percent above the age of 60. These figures may seem alarming but they still do not capture the fact that women who do get the chance to live are disadvantaged at every stage in life, starting right from their childhood when their brothers get more privileges than her. Sons get better education opportunities which helps them in acquiring skills that enable them to secure a good job and higher wage in the labor market. This is depicted by a gap of 7 % in primary enrolment, 20% in secondary enrolment and 26% in labor force participation. In many countries women do not have independent rights to own land, manage property, conduct business or even travel without husband's consent Duflo (2012).

Htun and Weldon (2012) find unequal inheritance rights for men and women in one third of the 63 countries studied.

Most of the research on discrimination faced by women has focused on the inequality met out to them in education, health care, labor market, etc. but off late the focus has shifted to how intra-household dynamics contributes to, or is a result of gender discrimination. For a long time, economists were content with Becker's 'unitary' model, which considers the household as one unit and the household head as a benevolent patriarch who considers the preferences of all members before making allocation decisions. But recent studies have disproved this model by showing that there are substantial differences in the welfare levels of the individuals of the same household which is caused by the difference in amount of power an individual wields within the household (Behrman (1988); Thomas (1990); Kanbur and Haddad (1994);Pitt, Rosenzweig et al. (1990)). Most of these models do not have the assumption of similar preferences or benevolent patriarch incorporating each member's preferences while deciding the optimal allocation. Instead, these models use unequal access to resources to explain the disparate levels of consumption, health and education outcomes enjoyed by the members of the household. Discrimination is also present in education and health care received by daughters and sons of the family (Chen, Huq et al. (1981) , Duflo and Udry (2004), Dercon and Krishnan (2000), and Ilahi (2000)).

The increase in female bargaining power inside the household has been associated with other good outcomes like decrease in fertility, child mortality and stunting, increase in child literacy and allocation of resources in favor of the children. Dyson and Moore (1983) call for an increase in social and political capacity of groups of female both as an end in itself and as a prerequisite for reduction in child mortality. Mason (1987) emphasizes on the importance of "status" of women in the "supply of children", i.e. the fertility rate. Many studies find that there is a strong correlation

between the income in control of the women and the well-being of the children in the household. Thomas (1990) finds that in Brazil when mothers have more unearned income in their hand, the health outcomes of the family are better.

Given that women face discrimination in every possible sphere of life, recognizing the appropriate avenues of development is very crucial. The importance of participation of women in the labor market, for emancipating her position in the society from that of servitude, was recognized as early as 1884 by Engels. The role of unearned income or assets has been also emphasized upon in the literature. To capture the balance of power within the household, the literature so far has focused mainly on indirect indicators that measure the bargaining power of women relative to the men of the household. The indicators include increase in working hours, wage rates and non-labor income, current assets, assets inherited by the women from their natal family in marriage, etc. (Blumberg and Coleman (1989), Pollak (2005), Lundberg, Pollak et al. (1997)). These papers find that households where women have more wealth, regardless of the source, spend more on food, clothing for women and children and education and observe improvement in children's and women's health and reduced fertility.((Doss 1997), Quisumbing and Maluccio (2000); Dercon and Krishnan (2000), Beegle, Frankenberg et al. (2001))

If we accept that the predictions of these models are valid universally, then one of the ways to improve the child and health outcomes in the developing and underdeveloped countries would be to empower women. For that it is important that we recognize the avenues for strengthening women's position within the family and the society. One of the most common result from several empirical analyses of women's bargaining power is that resources such as income and assets empower women (Agarwal (1994), Kabeer (1999), Quisumbing (2003)). Ownership of land and house jointly with men, in comparison to all male property rights, has also shown a positive effect

on the decision making power of women (Datta (2006), Panda and Agarwal (2005)). Studies have shown that women's wage earning and education have a positive impact on her bargaining power but impact of relatively good education is higher (Koolwal (2005), Orrefice and Bercea (2007), Age difference between the partners also affects the balance of power within the household (Friedberg and Webb (2006)). In some studies, women's absolute level of earnings has no impact on bargaining power at all, while a lower gender wage gap in the local labor market does appear to significantly lower women's unpaid work load (MacPhail and Dong (2007)) and reduces domestic violence (Aizer (2007)). Other extra-household variables also appear to affect bargaining power. For example, studies have shown that more gender-aware divorce laws reduce women's suicide rate, domestic violence, and the number of women murdered by their partners (Hoddinott and Adam (1998), Stevenson and Wolfers (2006)). These studies show that while individual access to and control over resources and household level variables has a big impact on bargaining power of women, other external community level variables like market wage and opportunity of employment also affects women's bargaining position.

Before rejoicing over finding the panacea for women's empowerment within the household, we should exercise caution as there are number of other papers which find that women's work, assets, earnings and education have no significant impact on their decision-making power and well-being in households. And, at times the effect is even negative. Most of these studies are based in South-Asia whereas the studies cited earlier are mostly based in developed countries. Such contradictory results are not only detrimental for the women's empowerment but also makes policy implications extremely difficult. However, the difference in the results could possibly be because of the fundamental difference in the countries/societies the studies are based on.

Agarwal (1997) points out that gendered social norms form a kind of pre-condition for household bargaining power. Thus the effectiveness of education and employment in empowering women will also be dependent on the social norms. Dito (2011) finds in rural Ethiopia, which has a rigid patriarchal society, gender norms play an extremely important role in determining the power positions and belief formation in the society. Mabsout and Van Staveren (2010) find that in Ethiopia gender norms play a very important role in determining the position of women in the society. The study shows that ethnic groups where gender norms are very unequal, individual and household level bargaining power variables effects are mediated by ethnic-gendered institutions. They call for changes in gender policy, which can effectively shift the emphasis from a largely individual approach to an institutional approach, to support women's empowerment.

Given the ample evidence that women living in countries which have patriarchal societies are affected by the existing gender norms of the society, it is important to study what role external factors play in empowering them, especially in a country like India. In my thesis I try to answer three main questions:

(i) Does labor force participation imparts more bargaining power to women?

(ii) Do female state legislators increase the bargaining power of women within the household?

(iii) Does having a female local leader improve the bargaining position of women living in the locality?

In the second chapter I present the conceptual framework of intra-household allocation. In this part I also explain how the theoretical models fall short in explaining the reality of India.

I address the question of how labor force participation increases women's bargaining power within the household in the third chapter. The link between labor force participation and increased bargaining power seems obvious. But generally such empirical analyses have concerns of

endogeneity due to presence of unobserved factors which simultaneously affect the outcome and the explanatory variable. With the use of a longitudinal data this problem can be circumvented as the model gets rid of all unobserved fixed effects.

My fourth chapter investigates, how female political representation affects intra-household allocation, by changing the balance of power. Recent studies dealing with intra-household allocation, especially in developing countries, have slowly started shifting their focus towards community level variables. Studies show that female political leader tends to support redistribution, child-related expenditure and are more liberal (Lott (1999),Edlund, Haider et al. (2005), Edlund and Pande (2002), Alesina and La Ferrara (2005), and Miller (2008)). Clots-Figueras (2011) shows that female politicians from the socially disadvantaged groups have a positive significant effect on women's succession laws in India. Studies so far have investigated the effect of political representation of women on various outcomes, however, the effect of female political participation on the decision making power of women has not been looked at. If women indeed tend to make redistributive policies, then their presence in politics should benefit women in general as women are highly discriminated against in India. To investigate this, I study the effect of female representation in politics on household bargaining power of women.

In my fifth chapter I make policy suggestions to improve the bargaining position of women on the basis of the results obtained in this chapter.

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Chapter 2

Conceptual framework

To address the issue of women's bargaining power it is very important to have an appropriate model. One of the earliest models suggested by Becker assumes that household decisions are taken by an altruistic patriarch or household head to maximize a common utility function. The unitary model suggested by Becker seems to be an over simplification of the complex household dynamics, and given the available data indicating the inequality meted out to women in the developing countries, it becomes very important to recognize the heterogeneity of preferences. Folbre (1986), Sen (1987) both are of the opinion that a model for household allocation, especially in developing countries, is better depicted as 'conflictual' rather than 'atomistic'. In the following section I briefly discuss the household bargaining models developed so far.

2.1 Household Bargaining Models

After Becker, several attempts have been made in designing household models which incorporate preference heterogeneity and the bargaining process that exist in households.

Pollak (2005) groups intra-family models into four main categories listed as below:

(a) Three models proposed by Gary Becker which can be grouped together under 'unitary models'.

(b) Chiappori's collective model and its various abstractions.

(c) Cooperative bargaining models along the lines of Manser and Brown (1980) and McElroy and Horney (1981)

(d) Non-cooperative bargaining models.

(a) Becker's unitary models

Becker discusses three types of models in his book 'A Treatise on the Family', Becker (1981). Through different avenues all these models abstract away from discussing intra-family allocations. Thus they can be broadly termed as 'unitary '. In Becker's altruist model one family member, the household head acts as a benevolent dictator. He maximizes his utility function subject to two constraints: a common resource constraint and a participation constraint, which necessitates that each household member gets at least her reservation utility. Since the utility of other family members enters as arguments in the household head's utility function, his utility maximization exercise does not necessarily bring down others' utility levels to their reservation utilities.

The second model proposed by Becker, the marriage market model, rules out bargaining within the marriage with the use of two assumptions: first, the prospective spouses can make binding arrangements regarding allocation in marriage in the market, which they abide by after marriage and second, all the participants exhibit 'standard rationality'. The assumption of 'standard rationality' prohibits the participants from settling with a spouse who offers less than what he or she would obtain in the next best option. Becker states that marriage market model works when there are numerous participants in the market and for each participant (both men and women) there are several other participants who are their close substitutes. Just like a perfectly competitive market each participant gets numerous options while choosing a partner and settles with their best match. So what really determines intra family allocation in a marriage is the perfect competition in marriage market.

Becker's third model assumes an efficient intra family allocation without specifying any particular model for it. This assumption, along with some other additional assumptions, helps him in analysis of household production in isolation from intra family allocation of resources.

(b) Chiappori's Collective Model

The collective model proposed by Chiappori (1988), Bourguignon and Chiappori (1992), solves the problem of intra family allocation using a sharing rule which is single valued and Pareto efficient, and satisfies certain regularity conditions. The model has some advantages but it has two main drawbacks. First, as Pollak (2005) points out that it does not specify a bargaining model, thus offering no guidance into the choice of variables that should be included as determinants of the bargaining power. Second Lundberg and Pollak (2003) argue that for major family decisions that affect the future bargaining power, the assumption that bargaining outcomes are efficient seems far-fetched. Unless the family members can make binding agreements, the validity of the assumption is questionable.

(c) Cooperative Bargaining Models

Most of the research on intra-family allocation have relied on the use of cooperative bargaining model and Nash Bargaining models in particular, as the standard tool of analysis. These bargaining models rely heavily on the use of a threat point. The threat point is reached in a cooperative bargaining game when cooperation breaks down. The threat point determines the bargaining power each partner has in the marriage.

In the Nash Bargaining framework, the household maximizes the product of gains to co-operation subject to some common resource constraint. In the marriage bargaining models proposed by

Manser and Brown (1980) and McElroy and Horney (1981), the threat point coincides with the reservation utilities. In both the models the threat point is considered to be divorce. The threat point is thus 'external to marriage'.

While the cooperative bargaining models inch closer to modelling the bargaining process that may happen in a marriage, it still falls short in depicting the reality. So this brings us to the next class of models i.e., non-cooperative bargaining models.

(d) Non- Cooperative Bargaining Models

A realistic depiction of bargaining within a marriage is not just important from an academic point of interest. It also helps in bolstering the position of women in the society, and empowerment within the household (marriage) is an important step towards it. Identifying and strengthening her threat options gives her more power. So recognizing threats which are credible becomes very important in understanding intra family dynamics.

Lundberg and Pollak (1993) argue that divorce is not always a relevant threat point in a marriage. There could be other outcomes which could characterize the break-down of marital co-operation like violence or threat of violence or a non-cooperative equilibrium with in a marriage. A non-cooperative equilibrium is attained in a marriage when each spouse maximizes his or her own utility, taking the strategy of the other spouse as given. Woolley (1988) was possibly the first paper that suggested using a non-cooperative Cournot Nash equilibrium within marriage as the threat point in a bargaining model. Following the suggestion made by Woolley (1988), Lundberg and Pollak (1993) model a non-cooperative equilibrium within a marriage as a threat point. In their model non-cooperative equilibrium is depicted as a voluntary contribution game where each

spouse allocates a part of their individual resources for provision of the household public good like child care.

This kind of non-cooperative equilibrium described in Lundberg and Pollak (1993) is what is frequently observed in South Asian countries, where the divorce rate is very low. In India, the divorce rate in 2011 was reported to be 1% and that too most of the cases are reported in urban areas. The divorce threat model is thus not applicable in case of South Asian countries.

Pollak (2005) identifies three main avenues in which women's bargaining power increases: exogenous non labor income, wage rates and productivity in household production. In my opinion, in a patriarchal society like India, exogenous non-wage income cannot be a big factor in determining how much say a woman has in the household. India suffers from regressive practices like dowry whereby money/ornaments are given to save her from domestic abuse by her in-laws rather than for her empowerment.

The problems with use of wage earnings as a determinant of bargaining power have also been widely discussed in the literature. It has been pointed out by several studies that using wage earnings as a determinant of bargaining power within the household is riddled by concerns of endogeneity. The third avenue of household production has not been looked at much in literature, mostly due to unavailability of data.

The theoretical models suggested in the literature can be good approximations of the reality if the assumptions hold. But sadly, neither the assumption of optimal allocation by a benevolent patriarch in unitary model', nor the assumption efficient allocation in collective model nor the use of divorce as a threat point in the cooperative model come close to the reality in societies are highly male dominant. Studies like Udry (1996) show that in Burkina Faso gender norms rather than economic

profit governs resource allocation on household farms. The efficient allocation is thus not achieved. Similarly, effectiveness of changes in individual and household level variables is governed by gender norm or gendered institutions in the society (Agarwal 1997). In the next section I briefly describe what role gendered institutions play in governing outcomes in the society.

2.2 Gendered Institutions

The process of household bargaining is very difficult to understand in the Indian context. To gain better insight and understanding of the factors affecting women's bargaining position in the household in India, I conducted a few Focus Group Discussions (FGDs) in the state of West Bengal in India in 2015. These FGDs were conducted in both rural and urban areas. A wide range of topics were covered which included namely educational attainment, employment status, status of their natal families, structure of the husband's family (nuclear or joint), fertility history, son preference, use of contraceptive, process of decision making in the household, bargaining process in the household, their views on girl child's right to education, women's labor force participation, domestic violence and empowerment of women in general. The FGDs brought out quite a few things to light. The gender roles have become so ingrained in the society that it is difficult for people to get out of them. It was observed that the most desired situation for women is where women take care of the household and the children and the men of the household take care of the financial requirements of the family. Education and exposure to media is helping in changing these views but it is a long ahead to the point here men and women will be treated equally. The major conclusion from the FGD was that social norms plays a major role in determining not just bargaining but also educational, marital outcomes within the household. For example, the practice of dowry in which the bride's family has to pay cash or give expensive gifts like cars or motorcycles discourages girl's parents from imparting higher education to her. This is because

more educated the bride is, more educated the groom has to be and the dowry amount increases proportionately with the groom's years of schooling. The gender norms also dictate the factors affect the bargaining power of women and how the bargaining happens in the household.

There are studies which corroborate the findings of my FGD. Gendered institutions in the society limit women's behavior more than men's in the society Folbre (1994). Gendered institutions have been defined as the asymmetric social norms, beliefs and practices affecting men's and women's behavior differently, and often unequally ((Goetz 1997);(Staveren and Ode bode 2007)). In the household bargaining literature, we find that bargaining can be defined well beyond the bargaining power derived from income and exit options—as a threat—that each partner has. Three more dimensions of bargaining have been acknowledged (Agarwal, 1997; Kabeer, 1999; Sen, 1990). First, the objects that are considered to be bargained over. For example, in many societies issues such as whether the husband marries a second wife, or the division of unpaid labor concerning cooking, cleaning and child care are often not up for negotiation. Second, men's and women's preferences are not just exogenously given but affected by beliefs and expectations. Sen (1990) has therefore referred to adaptive preferences, which tend to reduce women's bargaining power by simply limiting what they seek to get out of the bargaining process, an effect comparable to the discouraged worker effect in labor markets. Third, bargaining agency, that is, the ways in which the bargaining is done. Some forms of bargaining may be more effective than others, and these tend to vary by gender. Men, for example, tend to bargain in more aggressive ways than women, who have often been socialized into submissive and indirect modes of communication and negotiation, not demanding explicitly what they want.

Having such gender norms in the society it becomes difficult to target the empowerment of women through conventional channels. In my dissertation I thus look at factors which can change or it at least challenge the existing norms of the society. For this I look at the effect of increase in female political representation at all levels of the society on women's bargaining position in the society. Policy makers generally have the power to acts as agents of change. Presence of female representatives can change the gender norms both by role model effect and better policy implications. And since one of the ways female policy makers can affect the positon of women in society is by expansion of labor market opportunities, I also look at the effect of female labor force participation on the increasing women's intra-household decision making power.

Chapter 3

Effect of labor force participation on household decision making

3.1 Introduction

The first attempt to model household-decision making was made by Becker which describes a unitary model where the head of the household decides on allocation and there are no conflicts of interests or preferences within the household. A big part of the literature on the topic of household decision making has dealt with either supporting or refuting the claims of the model. Lundberg and Pollak (1994). But recent studies have more often than not dismissed the assumptions of the model, especially in cases of the developing Asian countries like India, Bangladesh, China, etc., which have patriarchal societies and big gender inequality (Anderson and Eswaran (2009), Li and Wu (2011)).

Papers which talk about preference heterogeneity have understandably used the difference in the economic position of the women in the house to explain how expenditure patterns change when she has either unearned income or when she is participating in the labor market. Main argument of these papers are, when women have some sort of income, which gives them more bargaining power and they can influence the spending pattern in the household, steering it in favor of the goods of her preference like items for women, children etc.(Thomas (1994), Duflo (2003), Bobonis (2009)). While these papers make a good case for existence of preference heterogeneity, they do not clearly establish that link between change in expenditure patterns and women's income share in the household. Antman (2014) With the study of change in expenditure patterns one can only guess how and why the expenditure patterns are different in households where women have a source of income (earned, unearned, or land ownership) from the ones where they do not.

Most of the household data surveys have typically shied away from asking about the prevalent gender relation within the household. Probably due to lack of such data, the bargaining power has been frequently measured in the literature with the use of proxies such as education, land ownership and employment history. Critics have argued that these variables contribute towards female autonomy within household and do not necessarily measure it. Malhotra and Mather (1997) argue that these indicators measure access to resources but they do not automatically indicate control; the connection must be established rather than assumed. Alkire (2007) also discusses some of the problems encountered while using proxy measure.

However, some recent household surveys have started gathering data on decision making process within the household. As a part of these surveys the female respondents are asked questions about how and who make decisions in the household in specific areas like expenditure, number of children to have, etc.

Arguably one of the main sources of bargaining power for women within the household is labor supply. But due to concerns of endogeneity, women's wage earnings have not been used very frequently to empirically test the role it plays in determining her bargaining power within the household. But for purposes of policy recommendations for empowerment of women it is also important to see if only the participation in labor market makes a difference. Antman (2014) finds that in Mexico women are more likely to be involved in purchase related decisions when she is employed. In this paper, using data from a longitudinal survey of households in India, I study the relationship between the labor market participation of women and her involvement in household decision making. It has been argued in the literature that households where women have more say will typically see more women participating in labor market. So estimating a direct causal effect of employment on household decision making is bound to have endogeneity concerns. But the use

of longitudinal data enables me to use a fixed effects model with panel on the female respondent. The use of a fixed effect model helps in getting rid of the potential endogeneity concerns by differencing out the household level fixed factors which simultaneously affect labor force participation and household decision making.

3.2. Data and descriptive statistics

The IHDS is a multi-topic nationally representative longitudinal family survey, which was organized by National Council of Applied Economic Research (NCAER), New Delhi, India in collaboration with researchers from University of Maryland. The survey was conducted in India in two rounds. The first round was conducted in 2004-05 in which 41554 households, spanning over 1503 rural and 971 urban neighborhoods were interviewed. The second round was conducted in 2011-12, which tried to re-interview 83% of the households interviewed in first round and also split households if they are located in the same village or town. The second round of IHDS added some more households from the same neighborhood bringing the total number of interviewed households to 42152. The survey represents all the then 33 States and Union Territories. Topics covered in this survey included health, education, employment status, marriage, gender relations, fertility, income among other things.

As a part of this survey eligible women (defined as women of age 18-49 years, who has been married at least once) were interviewed from each household in both rounds. In the second round some of these women who were eligible for this categorization in first round became ineligible for the survey but were still interviewed. From some of the households two eligible women were interviewed. The number of eligible women interviewed increased from 33,482 in 2004-05 to 39,523 in 2011-12.

The questionnaire contains a section where the eligible woman is asked certain questions, which helps us in assessing her level of autonomy inside the household. These questions covered in the gender relation section capture her decision making power, her physical autonomy and her economic autonomy.

The list of questions asked which concern her involvement in decision making in the first round (2004-05) are given below:

Whether her opinion counts when a decision is made regarding -

a. Items to cook on a daily basis

b. Purchase of an expensive durable item like refrigerator or television

c. Number of children to have

d. Treatment of child's illness

e. Marriage of children

To the above list of questions some more were added in second wave of 2011-12 which increased the coverage of topics under gender relations. The additional questions are:

Whether her opinion counts when a decision is made regarding -

a. Treatment during the respondent's illness

b. Purchase of land/property

c. Expenditure during social functions

Along with the information on gender relations the survey also gives detailed information about the eligible woman's education, marital history, fertility, health beliefs, anthropometry etc.

Table 1 shows the descriptive statistics of the main respondent who has been defined as the eligible woman in IHDS. We can see from the table that on an average there has been an overall improvement in women's involvement in decision making.

The estimation sample for the fixed effect model however has been restricted to only those eligible women who report consistent data on their age, age of their husband, years of schooling of both the eligible woman and her husband, sex of the first child and the length of marriage. Also only those women, who were living with their husband in both the round, have been considered. The dataset contains data like how many years the family has been living in the same locality. Only those women who have lived in the same household for 25 or more years and those who have migrated from another place within the same district were considered. Table 2 gives details of the explanatory and decision making variables of the estimation sample.

3.3 Empirical Model

To study how income empowers women often the role played by wage and non-wage income has been discussed. But there are many problems associated with using the wage earning as a determinant of household bargaining power which have been widely discussed in the literature. Pollak (2005) identifies four of them. First two are relevant to the Nash bargaining framework where the threat points, as discussed earlier, are either divorce or non-cooperative equilibrium in marriage. The first reason corresponds to the fact that the women have different work patterns in and out of the cooperative equilibrium. For example, a wife may choose to work less in the cooperative outcome than in the non-cooperative outcome. So her earnings in the cooperative equilibrium are a poor proxy of her earnings in the non-cooperative equilibrium. The second reason is wage earnings in non-cooperative equilibrium does not determine a woman's bargaining power in the cooperative outcome. This is because her earnings are her hours of work in the labor market times wage rate, and the hours of work vary with the type of equilibrium observed. So it's really her implicit wage rate that matters. The third reason is that if wage rate is a function of the hours worked then her entire wage schedule matters. Last, if her work is such that hours worked today affects the wage rate received tomorrow then a dynamic model is required for the analysis.

Another major problem that has been highlighted for use of the wage earnings in empirical estimation of bargaining power by Basu (2006). He argues that a women's role in household decision making depends on her bargaining power, which is affected by her earnings. But her earnings are affected by her past bargaining power. So there is an inherent problem of reverse causation.

Even though merits and demerits of using wage earnings has been widely discussed, the link between labor force participation and women's bargaining power within the household has not been looked at much. Majlesi (2016) finds that demand shocks, caused by China's admission to the WTO, across Mexican industries increased labor market opportunities for women that led to an increase in their decision making power and improved children's health.

I use a household fixed effect model to assess the effect of the respondent's (eligible woman) participation in labor market on her involvement in household decision making in the matters of purchase of an expensive durable and fertility. The regression model used is given below.

$$dm_{jdt} = \alpha_j + \theta_t + \beta worksforwages_{jdt} + X_{jdt}\gamma + Z_{dt}\delta + \mu_{jdt} \quad 3.1$$

The subscript j stands for the j^{th} respondent in IHDS round t which takes value 1 and 2. The above equation is estimated for involvement in making decisions of purchase and fertility. α stands for the household level fixed effects and since the panel is on household, the estimation of the model gets rid of not only the household level fixed effect, but also other fixed effects that affect the balance of power within a household. worksforwages is a dummy variable which takes the value 1 if the j^{th} respondent is participating in the labor market in round t and 0 otherwise. X and Z indicate household level controls and district level controls that could affect the decision making power of women. θ stands for the time fixed effects that capture the nationwide shocks that affect all the women.

3.4 Results

Table 4 and 5 report the results from the estimation of linear probability version of equation 1.1 for the purchase decision and fertility decision respectively. The estimation sample for both the

decisions is restricted to only those families who have either always lived in the current neighborhood, or those who have migrated only within the same district. The reason I use this check is because district is the lowest level that I can identify in the survey. Since I include district level controls in my model, households that have migrated from outside the district may have different characteristics in the two rounds, which fixed effect model may not be able to get rid of. For both the tables, Column 1 reports the coefficient from the OLS estimation of the model in second round. Similarly, Column 2 of both table 4 and 5 reports the coefficient from estimation of the fixed effect model and column 3 restricts the estimation sample to only those women who did not report being employed at the time of the first round. Additionally, for assessing the involvement of women in making fertility decision, I restrict the sample to only those women who reported to be 45 years old or younger in both rounds. The reason for restricting the sample is because women older than 45 seldom have to make fertility decisions and hence the responses would be based on recall which may not always be accurate.

Table 4 shows that when women are working for wages outside the house their involvement in making purchase decisions significantly increases. The fixed effect coefficients are larger than the OLS coefficient. Column 2 shows that when women participate in the labor market the probability of their involvement in making purchase decisions increases by 4.3 percent and when I restrict the sample to those women who were not working during the first round of the survey, the effect increases to 9.1 percent. I also control for women's work participation in the household farm, household non-farm business and animal husbandry. Working on the household farm and non-farm business has a significant negative effect in column 2. This implies that the work women do on the household business decreases her decision making power.

One of the other controls included in the model is presence of mother in law in the same household which understandably has a negative coefficient implying presence of a mother in law decreases the bargaining power of the respondent. The respondent having a son does not have a significant effect on her decision making power but her being married to the head of the household does. Among the district controls, male literacy rate and share of population belonging to SC/ST categories have significant negative coefficients. Share of working female in total female population and share of population living in rural area of the district have significant positive coefficients.

Table 5 shows the results of regression of respondents' involvement in fertility decisions. The fixed effect model coefficient is significant at 1 percent for the entire sample of women belonging to age group < 45 years as well as when the sample is restricted to those women who were not working during the first round of survey. The coefficient jumps from 0.026 in column 2 to 0.081 in column 3. Coefficients on her participation in other types of work are not significant except for the respondent working in the non-farm business in the entire sample of women. The district level controls that significantly affect the dependent variable are male literacy rate (negatively) and share of working female in total female population in the district (positively).

The estimation results discussed above indicate that labor force participation has a definite positive effect on women's involvement in making two major household decisions. This is indicated not only by the positive coefficient on the labor force participation of the respondent but also by the highly significant coefficient on the share of working women in the district. This ratio has been included in the model to somewhat capture the supply side or the labor market situation of the district. A positive coefficient on these variables indicates that districts with better labor market opportunities have more empowered women.

3.5 Conclusion

The literature on intra household allocation have so far focused on either proving or disproving Becker's 'unitary' models. Most of the papers which don't agree with the model have shown that households are units with heterogeneous preferences, and when women have economic power they can steer the household expenditure in the direction of their preference, thus spending more on better child and health outcomes. However, what the literature fails to show is if there is a direct causal effect of women's labor force participation on the unobserved decision making process of the household. Using a nationally representative longitudinal data from India, this paper shows that when women participate in the labor market they have more power in making household decisions not only in the matters of purchase but also in the matters of fertility. An obvious policy implication of this result is that implementation of employment schemes that benefits women will increase her bargaining power within the household and also help India as a society in inching towards gender equality.

Chapter 4

Effect of female political representation on women's bargaining power within the household

4.1 Introduction

Women makeup at least half of the population all around the world, but they are highly underrepresented in all political positions. The picture is not very different in India. Even though India was one of the very few countries to be headed by a women prime minister as early as 1966, the political representation of women remains dismal in major part of the country. However, an important question remains that with larger political representation will women's policy choices be differently effective than men.

In models of political economy where candidates only care about winning elections and can commit to specific policies, their political decisions reflect electorate preferences Downs (1957) . If such model holds then policy choices of female political representative will not be different from their male counterparts as the median voter equilibrium will prevail. Thus, as long as women are a part of the electorate, the winning candidate regardless of the gender will represent their preferences. But in absence of complete policy commitment the identity of the legislator does make a difference in policy decisions (Besley and Coate (1997), Osborne and Slivinski (1996)).

A related question in this regard is if having more women in positions of power will reduce the high gender inequality that prevails in India. It is a well-established fact that a manifestation of skewed gender relations is low bargaining power of women within the household. In this chapter I investigate if female representation at both state and local level plays a role in increasing the women's bargaining power within the household in India.

While it seems more likely that household specific characteristics will play a more important role in determining the bargaining power of women, it is difficult to identify the factors as empirical estimations are riddled with concerns of endogeneity, and finding good instruments for the variables of interests becomes a challenge. Studying the effect of variables at community level is comparatively easy as these are mostly supply side variables from a household perspective. Agarwal (1997) in her seminal paper identifies various factors, which can increase the women's bargaining power within the household living in rural areas, lot of which are variables at community level. These variables include her access to employment and income earning means, access to communal resources such as village commons and forests, access to traditional support systems such as patronage, kinship, caste groupings etc., and support from NGO's and support from the state.

India follows a dual polity system, with a central authority at the center and states at the periphery. The constitution defines the organization powers and limitations of both central and state governments. The state has the power to make laws in various areas including education, women welfare, health etc. However, the state government relies heavily on the various local governments for implementation of national and state policies. The state legislators not only take inputs on the requirements of their electorate from the local leaders but also implement policies through them. State legislators can actually play an active role in improving the social indicators of India but that can happen only if local leaders work with them in tandem.

To the best of my knowledge there aren't any papers which look at the link between female political representation and women's involvement in household decision making. There are papers which study the effect of female political representation at local level on female labor force participation or female entrepreneurship in India, though none have looked at the decision making

power of women within the household (Ghani, Mani et al. (2013), Ghani, Kerr et al. (2014)). They finds that women's overall district level labor force participation and entrepreneurship increases with longer exposure to female political representatives (PR) at local level. They also find that greater exposure to women PRs at the local level raises the share of public employment opportunities allocated to women under the Mahatma Gandhi National Rural Employment Guarantee Act, 2005 (MGNREGA). Therefore, this is probably the first attempt to study the effect of female political representation at both state and local level of government on the decision making power of women within the household. In this chapter I investigate two main effects:

a) Effect of share of female state legislators on the women's bargaining power within the household in the district from which they are elected.
b) Effect of having a female village head on the women's bargaining power within the household

Currently, in India, political representation of women at local level is significantly different from that in state or central level. This is mainly the outcome of the implementation of the 73rd and 74th Amendment in 1993. The 73rd and the 74th Constitutional Amendment increased the representation of women in all local governing bodies to at least 33 percent. However, the seat of local government head (Village Pradhan or Ward Councilor) is reserved for women only every third election cycle, and not all villages within a district have this reservation at the same time. No reservations for women have been made in the state or central legislatures. In 1996 a Bill that reserves 33 percent seats for women in Lok Sabha (Lower house of the Central Government) and State Assemblies was introduced. This bill is currently under debate. In 2010 it was passed by the Rajya Sabha (Upper House of the Central government). It still needs to be passed by the Lok Sabha and over 50 percent of State Assemblies. Both the groups in favor and in opposition to the bill

agree that female politicians behave differently from male politicians and hence this bill will change the political scenario in India: starting with voter preference, quality of the candidates participating in the election, political competition and the political decisions. So an increase in female representation at state legislature can be seen as a result of change in perception towards having women in positions of political power whereas the increase in female representation at local governments is more of a policy change.

Voter preference can play a role in electing more or less women to the state legislature from a district. So to study the effect of an increase in female representation at state level on any variable, one has to partial out the voter preference. To do this, the occurrence of close elections between male and female contestants can be used. A close election is mainly defined as an election where there was a very narrow gap between the votes won by the winner and the runner up. So if a female contestant wins a close election against a male contestant it implies that there was no clear preference for the female contestant in the area where the election was held, thus making her win pseudo-random, as the winner could have also been the male contestant. Hence I use female politicians, winning in close election against men, as an instrument for the share of female state legislators from a district.

As stated earlier the 73rd and 74th Constitutional Amendments reserve the seat of head of the local government in every third election cycle, but that does not necessarily mean that a village can have a female head only then. The Village Pradhan (VP) is selected from amongst the elected members and if there is a voter preference for female leaders in the village then a woman can be elected as the VP. So I am using the reservation of seat for women as an instrument for the sex of the VP.

The link between higher female representation at state level and household bargaining power of women cannot be established very easily. Improvement in intra-household position of women

cannot be achieved just by passing a policy, especially in a society like India. It has to be a complex interaction between changes in policies affecting women welfare, implementation of these policies, and a change in the mindset of the population. There are several community level factors that can affect the bargaining power of women (Agarwal (1997)). Most of these involve fostering a stronger social network through village commons or NGOs so that women can get support from sources outside their household. State politicians can play a prominent role in improvement of these social networks through women welfare policies and in increasing awareness about the same. Female local leaders can help female state legislators in choosing and implementing the policies which favor women. So now the question arises, whether female politicians actually make policy choices which increase women welfare in general.

Several studies show women tend to support redistribution, child-related expenditure and are more liberal (Lott (1999), Edlund and Pande (2002), Edlund, Haider et al. (2005), Alesina and La Ferrara (2005), Miller (2008)). As discussed earlier there are many papers which talk about how increase in women's income in the household leads to better health outcomes for children and also changes the expenditure pattern of the household in favor of women and children.(Thomas (1990), Lundberg, Pollak et al. (1997)). These observations also project to women's representation in the politics.

There is a vast literature which talks about how women politicians make policy choices different from their male counterparts in the United States. Thomas and Welch (1991) find that compared to male members, female members of twelve US state houses attach greater importance to legislation on issues concerning family, women and children. Thomas (1991) shows that states where women have higher representation introduce and pass more bills concerning issues of women, children and families than the states where female representation is not high. Case (1998)

finds that increase in number of female legislators in the state lead to the strengthening of the state's child support enforcement policies. Besley and Case (2000) show that fraction of female state politicians in the upper and lower state houses have a positive significant effect on the state's workers' compensation.

A very important question at this juncture is how do female state politicians work with local female leaders? State level politicians do not have direct interaction with women of their constituency. It is not easy for the state politicians to meet their electorate on a regular basis, neither do the electorate have an easy access to the Member of Legislative Assembly (MLA) from their constituency. However, the people living in a village or a ward (equivalent to a village in urban area) can easily access their local leader. Also the policies that the state politicians make are ultimately implemented by politicians at the local level. So the local leader plays a very significant role in linking the MLA to their electorate. Thus, it is also important to investigate if the linking factor between the electorate and the politicians, i.e. the local leaders, have any significant effect on the bargaining power of women

The focus group discussions that I conducted in 2015 in the state of West Bengal revealed that the women feel more comfortable approaching a female leader rather than a male leader. The participants of the discussion felt that female leaders are more compassionate and understanding towards women. They expect to be helped more by female leaders. They were also of the opinion that women leaders are more effective in ensuring safety of women. But at the same time there were few women who opined that a local leader has limited power. The effectiveness of the local leaders ultimately depends on the MLA they report to. The participants felt that there are times when the local leaders want to help but can't do much as they do not get enough support from their

MLA. One of the participants who had a female village head at the time of the FGD said the following:

> *"When we approach her with our problems, she listens to us patiently. But at times she says I understand your problem but you know as well that my hands are tied. I have to report to a higher authority (MLAs) and they decide everything"*

But, in general, the participants seemed to agree to the fact that a female local leader can play a significant role in representing the needs of the female electorate. Having a female local leader is definitely a positive step but at the same time having representation at the state level is also important. From the focus group discussion, it may be inferred that when the local leader and the member of the State Legislative Assembly are both female, they work in better in unison regardless of their political affiliations. Kumari and Dubey (1994) find that irrespective of the party affiliations female politicians unite on women related issues.

A part of the IHDS also includes a section where a village level representative was asked various questions about the village. In the second round that was conducted in 2011-12 the survey included questions on the gender of the then Village Pradhan (VP) and the reservation status of the seat of the VP. Using this data, I also investigate if the effect of female state legislators on the women's bargaining power within the household in her district increases when the seat of the VP is reserved for women.

In societies where there is under-representation of a group in any field, mandatory reservation is seen as a way to ensure a minimum representation. This was the idea behind reserving one third of seats in all local governing bodies for women. Most of the existing literature in India that studies the role that female politicians play in influencing various outcome variables focus on the causal effect of this mandatory reservation. Chattopadhyay and Duflo (2004) show that in West Bengal

and Rajasthan reservation of one third of the seats for women in the Panchayats (rural local governments) has led to an increase in investment in infrastructures which are relevant to women's needs. Iyer, Mani et al. (2012) show that these mandatory reservations have led to an increase in reporting of crime against women.

India as a society witnesses not just gender discrimination but also caste discrimination. There are several groups of socially backward and indigenous people in India, known as Scheduled Castes (SC) and Scheduled Tribe (ST) respectively. These groups have historically faced severe discrimination. As per the latest Indian Census of 2011, SCs and STs make up 16.6% and 8.6% of India's population respectively. In each state a fraction of seats is reserved for SCs and STs justifying their population representation. Pande (2003) shows that reservations of seats in State Legislative Assembly for SC and ST has led to significant increase in transfers to these groups.

Very few studies have attempted to investigate the causal impact of female political representation in absence of mandatory reservations. But the papers that attempt to do any such analysis rely on the use of close elections, won by women against men, as an instrument to identify the effect of female political representation. Rehavi (2007) finds in 1990s an increase in female state legislators in US led to an increase in the public welfare expenditure. Clots-Figueras (2011) uses close elections as an instrument to study the effect of the fraction of female state legislators on public goods, policy and expenditure in India. They find that female state legislators from the seats reserved for SCs and STs invest more in health and early education and favor "women-friendly" laws, such as amendments to the Hindu Succession Act, which was designed to give women the same inheritance rights as men. Using fraction of women as the instrument for fraction of female state legislators, Bhalotra and Clots-Figueras (2014) finds that an increase in women's political

representation in Vidhan Sabha leads to a significant decrease in neonatal mortality in the districts from where they are elected.

The rest of the chapter is organized as follows: Section 2 talks about the administrative structure of India and female representation in Indian politics, Section 3 talks about data and empirical model, Section 4 talks about the empirical findings, Section 5 lists the robustness checks used and Section 6 concludes the paper.

4.2 Background

Administrative structure in India

In this section I give details of the administrative structure of India. I explain how the power is divided among the different types of governments: namely the state and local governments. I also explain how members are elected to each government and its administrative hierarchy.

4.2.1 State governance in India

India has federal system of governance with the central government at the center and the states at periphery. The central government is bicameral consisting of the Lok Sabha or the lower house and the Rajya Sabha or the upper house. Most of the states have unicameral governments consisting of the State Legislative Assembly (Vidhan Sabha). However, the states like Jammu and Kashmir, Uttar Pradesh, Bihar, Maharashtra, Andhra Pradesh, Telengana and Karnataka have a bicameral government consisting of Vidhan Sabha and Vidhan Parishad or the State Legislative Council. The members of Vidhan Sabha or Members of state Legislative Assembly (MLAs) are elected by the people of the respective state. The election of the members of Vidhan Parishad for

the seven states are not elected through open public elections. While the members of Lok Sabha are elected directly by the people of India, the members of Rajya Sabha are elected by members of the State Legislative Assemblies using proportional representation.

Elections of the Vidhan Sabha and Lok Sabha follow the system of universal adult suffrage. Any citizen above the age of 18, who has a sound mind and does not have a criminal record can vote irrespective of their caste, religion or gender. To contest these elections one needs to be a registered voter above the age of 25. To contest in a state election one needs to be a resident of the constituency from which they wish to contest.

As of 2014, twenty-nine states and two union territories in India have their own Legislative Assembly. Each state is divided into several single-member constituencies depending on the state's population. The number of seats in a State Legislative Assembly depends on the state's population. So, where a populous state like Uttar Pradesh has 403 seats, a relatively less populated north eastern state of Nagaland has around 50 seats. Constituencies are demarcated in such a way that has all have similar population representation. Winner from the constituencies form the Vidhan Sabha.

India has multi party political system. Contesting parties each field one candidate from a constituency and the candidate getting the maximum number of votes wins the election from the constituency. Each elected representative gets a term of five years.

The state government has substantial power in matters of legislation. The issues that fall under the purview of State Legislation are public order and police, land rights, health, agriculture, irrigation, industry and minerals. Other issues are jointly managed by state and central governments, with the state governments having more influence on issues of education, transportation and social security. Even though as a body of political representatives, Lok Sabha holds the maximum power,

it cannot make any Constitutional Amendment without the bill being passed by both Rajya Sabha and Lok Sabha and at least 50 percent of the State Governments.

The State Legislative Assembly is also responsible for managing the local governments and allocating expenditure for their governance. The members of state legislature are also the associate members of their respective District Council (Zilla Parishad). The governance under the state government can be divided into two groups: rural governance and urban governance. Zilla Parishad forms the top tier of the rural governance in India. Figure 1 shows the breakdown administrative structure of India.

4.2.2 Local Governance in India

Panchayat System

The Panchayat system has been in place in India since the 1880's, and was set up by the British. Traditionally operating at the village level, Panchayat consisted of a small number of people chosen by the villagers to manage its local affairs. The Panchayat system wasn't organized until the end of 1980's and was an ad-hoc body, selected by people without any formal election process. The duties and functions of the Panchayats weren't standardized. By the mid of 20th Century Panchayats were organized often to embody "concealed forms of social prejudice, oppression and exploitation that were firmly rooted in local power structures" (GOI 2008). Towards the latter half of 20th century there was a growing consensus that the Panchayat system was in need of structural revival. Some states like West Bengal, Andhra Pradesh had already restructured the local governance to make room for a decentralized Panchayat system. By 1989 there was a nationwide support to implement similar decentralization in all state. Thus in 1992 two separate sets of

Constitutional Amendments (73rd and 74th) were passed by the Central and State governments to install the Panchayat Raj system in its current form.

The 73rd Constitutional Amendment put in place a three-tiered system of local governance for rural areas, with the Gram Panchayat being responsible at the village level, the Panchayat Samiti at block level and Zilla Parishad at district level. Similarly, the 74th Constitutional Amendment act restructured the local governance for the urban areas. With these amendments in place the local government bodies are elected through formal elections, which are held every five years. These amendments also made provision to reserve 33% of the seats in all local government bodies for women. Voters elect the members of the Gram Panchayat and these members chose their Pradhan (chief) from amongst the elected members. The seat of VP is reserved for a woman every third election cycle. The roles and responsibilities of the Panchayats are also clearly defined. The responsibilities of the Panchayat now include administration of state transfer programs, planning and implementation of schemes for economic development, establishment and administration of local public goods such as education and medical facilities, oversight of local infrastructure (water, sewage, road etc.) and the monitoring of civil servants. Any decision taken in the Panchayats are done through majority voting. The VP doesn't have a veto power.

State Government and the Panchayat System

Even though the 73rd Constitutional Amendment provides enhanced powers to the local governments, it doesn't give them unlimited authority and freedom. The State Government exercise controls over these local bodies. These controls are necessary because the village leaders are local people and can have vested interests. State control is also necessary for proper direction, unification and coordination of the civic services and for securing consistency and continuity both in the formulation and implementation of the national and state policies (Singh, Singh et al.

(2005)). The VP thus reports to the Member of the Legislative Assembly of the constituency under which the village falls.

4.2.3 Female representation in politics

Given the electoral system in India, if the median voter equilibrium prevails then there should not be any difference in the policy measures of male and female politicians as both men and women are a part of the electorate (Downs 1957). However, in absence of full policy commitment, studies have found significant difference between policies implemented by male and female political leaders (Besley and Coate (1997)).

Women who participated in the focus group discussions also had similar opinion. They said female local leaders understand women's' problems better and are more approachable and compassionate. But the respondents also pointed out that the effectiveness of the local leaders depend to a large extent on the member of the State Legislative Assembly they report to. There have been several other qualitative studies on what effect women politicians have on the policy outcomes. Most of these studies analyze the data collected from interview of female politicians. These studies show that despite being very small in number, female political representatives have been able to affect the policy decisions. Owing to the decision making process in Indian legislatures, women politicians have the means of convincing other legislators about policies and also put forward new ideas in the legislature which are then debated on.

Mishra (2000) shows that in Orissa Legislative Assembly female legislators play a very active role in legislature. They introduce proposals, are active participants in debate and try to convince their male counterparts of their ideas. When asked what steps they have taken to promote women's rights and progress, 41% said they privately tried to convince members from other parties, 27.3% agreed to seeking support outside their parties, 50% reported speaking on the floor, 13.63% of the

respondents had offered amendments, 13.63% had worked in committees and 4.54% had sponsored bills. Female politicians bring women's issues to the front and manage to get them included in their party's manifesto (Singh (2003)). Regardless of their party affiliations women politicians seem to agree on women's issue (Kumari and Dubey (1994)). A survey of female legislators conducted by Pundir and Singh in 2002 in the state of Uttar Pradesh pointed towards the fact that most female legislators act as a bridge between the state and the people and are instrumental in provision of public goods such as opening schools, providing local amenities, building infrastructure, etc. in their constituencies.

Empirical papers which talk about the effect of female state politicians in India on various outcome variables find that female politicians can and do bring a change in the areas which are of significance to women (Bhalotra and Clots-Figueras (2014) ,Clots-Figueras (2011)).

4.3 Data and Descriptive Statistics

This paper uses three different types of data from India - A longitudinal household survey, state election results and district level census data. The household survey data is taken from the India Human Development Survey (IHDS) (http://www.ihds.info). The village level data too comes from the IHDS. The election data is taken from the website of the Election Commission of India (http://eci.nic.in/eci/eci.html). The census data is take from the Census of India website (http://censusindia.gov.in/).

Village level data

In both rounds of IHDS representatives from village governing body were interviewed and asked questions about the social composition of the village, common sources of employment in the

village, condition of village roads, sanitation and other infrastructure variables etc. However only in the second round of the survey, questions related to the gender of the VP were asked. Therefore, for the analysis of the effect of the gender of the VP on the household bargaining power of the women living in the village, I can only use data from the second round and hence I do a cross sectional study. The details of some of the social indicators of the villages is given in table 6.

State Election Data

The Election Commission of India website contains detailed results of every State Assembly and Parliamentary election held in India till date. For this analysis I have used constituency level data on the type of assembly constituency (general, schedule caste, schedule tribe), sex of contestants, political party affiliation and votes received by the contestants, and male and female voter turnout. Even though constituencies are the units in which elections are held, and detailed constituency level data is available, IHDS does not mention the State Assembly constituency under which the household directly falls. The household data identifies state and district of residence of the household. So I had to aggregate the constituency level data to arrive at district level variables.

Figure 2 shows how female representation in state legislature has increased over the years. The highest ever female representation till date has been in the State Assembly of Haryana in the election of 2014, which stands at a dismal 14.4%. Figure 3 shows state wise trends of share of female representation in State Assembly from 1980s-2010s.

For creating district level variables, I performed two types of matching. The first was grouping political parties of winners and runner up from the constituencies into 6 broad categories: Congress, Soft Left, Hard Left, Hindu Right, Right of Center and Others. For this I extended the

classification given by Besley and Burgess (2001). The second was matching all the constituencies to districts. (See Kumar and Somanathan (2009) and Delimitation Orders of India 2008, 1976)

After matching the constituencies to district I created the district level variables on:

1. Proportion of female state legislatures
2. Proportion of female contestants
3. Proportion of close elections with various vote margin (2.5 %, 3%, 3.5% and 4%)
4. Proportion of close election won by female contestants
5. Proportion of seats won by Congress, Soft Left, Hard Left, Hindu Right, Right of Center and Others parties
6. Male and female turnout
7. Average vote margin in male-female elections

Table 7 gives descriptive statistics of the state election outcomes for the districts in the election held at least a year before the two rounds of survey were conducted.

Census Data of India

The Indian census gives detailed district level information on various socio economic parameters. For this analysis I have used variables like rural-urban population share, SC/ST population share, male and female literacy rates and male-female working population share.

Table 3 below gives descriptive statistics of district level controls.

4.4 Empirical Model

4.4.1 Effect of female state legislators on household bargaining power of women

To investigate the relationship between the women's bargaining power within the household and the share of female state legislators from the district, I performed panel data analysis. In this analysis I looked only at the questions related to decision making autonomy. From the questions related to decision making I focused only on the ones related to matters of fertility, and purchase of durables. There are four main reasons for selecting these questions. Firstly, these questions appeared in both the rounds of survey. Secondly, these are decisions which every household has to make, regardless of the strata of the society it belongs to. Thirdly, these are important enough matters in which the male or the senior members of the household may not want to relinquish control. Finally, the use of these questions especially the one related to purchase is supported by the limited literature on this topic. Most of the papers which have tried to study female autonomy through the answers to such questions of involvement in decision making process, have focused mainly on the purchase related questions (Anderson and Eswaran (2009)). The involvement of the women of the household in these decisions can be a good reflection of how much bargaining power they have in their house.

The questions related to children's marriage are also important. However, these decisions are not made very frequently. Hence, the answers to these questions may not be based on real experiences. The decision about what to cook on a daily basis, or what to do when a child falls sick are areas where the male members may not want to intervene as these are typically considered women's sphere. The literature on separate sphere bargaining supports this claim. Therefore, these questions were not considered in the main analysis.

This section explains how the empirical methodology takes care of the problem of endogeneity that may arise in this study. To illustrate this let us first look at the first empirical specification.

$$dm_{jd} = \alpha_d + \theta_t + \beta female_d + X_{jd}\gamma + Z_d\delta + \mu_{jd} \quad (4.1)$$

The subscript j stands for the j[th] respondent being interviewed living in district d at the time of IHDS second round. Involvement of the respondent in making decisions related to fertility and purchase is estimated separately. If respondent j living in district d is involved in making decision i, dm takes value 1 else it takes value 0. Fraction of seats won by the female politicians in district d in the election before the interview was held is denoted by $female_d$. I consider the state fraction of female politicians in the election which was held at least one year before the survey. This gap has been considered standard by the existing literature for the policy changes to take place. X and Z stand for the household/respondent specific and district specific characteristics respectively.

The cross section specification given above helps in capturing the across individual variation, but it has biases. The district level controls used in the specification above take care of the difference across districts in literacy, SC/ST population share, share of population living in rural areas and the share of female working population, however the existence of other district specific trends that can drive both female representation and decision making autonomy cannot be ruled out. To address this bias, I use data from both the rounds of survey and fixed effect specification given below:

$$dm_{jdt} = \alpha_j + \theta_t + \beta\, female_{dt-1} + X_{jdt}\gamma + Z_{dt}\delta + \mu_{jdt} \quad (4.2)$$

The subscript j stands for the jth respondent in IHDS round t which takes value 1 and 2. The above equation is estimated for involvement in making decisions of purchase and fertility. If respondent j living in district d is involved in making decision i in round t, dm takes value 1 else it takes value 0. Fraction of seats won by the female politicians in district d in the election before the

interview was held in round t is denoted by $female$. X and Z stand for the household/respondent specific and district specific characteristics during round t respectively. θ_t captures the year fixed effects control for nationwide shocks in the year of survey.

Even though district fixed effects control for the permanent differences across districts in female representation and the outcome variable, a potential source of endogeneity still remains. There can still be an omitted variable bias which could affect both the dependent and independent variable. The share of female state legislator from a district can be correlated with voter preference which in turn can be a result of district level bias for/against women. This bias can also affect the outcome variable through community effect. Estimating the above equation using models which assume independent and identically distributed error terms (linear probability model or probit/logit) will produce biased results.

To address this problem, I make use of the existence of close elections between male and female contestants in the district. A close election in my analysis has been defined as an election where the victory of margin between the winner and runner-up is very small and they are of opposite genders. A very small margin of victory indicates that the winner barely won and that there was no clear preference for the winner over the runner-up. In this context a female contestant winning over a male contestant in a close election from a constituency would imply that there isn't any preference for female politicians in the constituency. There is uncertainty about the final outcome of a very close election so the winner is chosen by chance. The male contestant thus has the same chances of winning a close election as the female contestant and probably some factors like turnout on the election day determines what the final outcome. Thus a female winning a close lection over a male contestant is considered pseudo-random Clots-Figueras (2011). Using this premise, I

instrument the overall share of female state legislators from the district with the share of female state legislators who won against male contestants in close elections. This instrument has been widely used in the literature (Rehavi (2007), Lee (2008), Clots-Figueras (2011), Bhalotra and Clots-Figueras (2014)). However, to use this instrument, its validity needs to be established. I check for the internal and external validity of the instrument.

4.4.1.1 Validity of the instrument

To prove that the instrument is valid, a few checks have to be conducted. I show that the probability of a woman winning a close election cannot be predicted in the sample of close elections and there isn't a significant difference in the district-election years where women against men and the district-election years where men against women in close elections.

Internal Validity of the instrument

Before using the share of close election won by female in a district as an instrument it is important to establish its internal validity. I run a few checks to show this. The first test that I run is to show that the instrument cannot be predicted by any other district level characteristics. In order to show this, I regressed the fraction of women winning close elections in the districts where there has been at least one close election, between a male and female contestant, on a set of other district characteristics. The regressors used in the analysis are proportion of winners from Congress parties, proportion of winners from Soft Left parties, proportion of winners from Hard Left parties, proportion of winners from Hindu Right parties, proportion of winners from Regional parties, proportion of winners from other parties, turnout on the day of election in the district, share of rural population in the district, share of SC/ST population in the district, literacy rate in the district, proportion of close elections in the previous election year, proportion of female winners in the

district in previous election and share of women. The regression shows that the fraction of women winning close election cannot be predicted by any of these district level characteristics. The results of these regressions are given in table 8.

The next step to prove the internal validity of the instrument is to show that there is no significant difference between the two type of districts and electoral years: one where more women won close elections, and other where more men won close elections. I show this by comparing various characteristics of the two types of districts in different electoral years. Table 9 shows the results of the difference in mean test of male literacy, female literacy, share of SC/ST population in the district, share of population living in rural area in the district, share of women winning in elections that are not close enough, number of female contestants per constituency seat, and male turnout and female turnout on the day of elections between the two types of districts.

External validity of the instrument

The outcome of a close election is pseudo random but district and electoral years which have close elections may not be random. Hence many papers have included the proportion of close elections as one of the controls in the estimation. To check for this, I do a mean comparison test between the district and electoral years that had close election with those that didn't have. The district characteristics for which the tests are conducted are male literacy rate, female literacy rate, share of the population living in rural areas, male and female turnout on the day of election, proportion of seats won by different political parties, and population share of SC/ST in the district. Some of the differences are significantly different in the two groups necessitating the use of proportion of

close election in the district as one of the controls. The results of this mean comparison test is give in table 10.

4.4.1.2 Empirical methodology

First Stage Regression

Having established the internal validity of the instrument, it can now be used for IV estimation. To use fraction of state assembly seats from a district won by women against men in close elections as an instrument for the fraction of state assembly seats from a district won by women we need to run the first stage regression given below to purge the endogenous regressor of bias due to voter preference. This method of estimation is based on the fact that the winner of close election cannot be predicted or predetermined by other district level characteristics and hence a female candidate winning a close election is pseudo-random. Thus, use of proportion of female politicians winning in close elections as an instrument should generate "near-experimental" causal estimates of the effect that female political representation has on the household decision making power of women. The first stage regression for the IV- panel regression is given by 4.3 below

$$female_{dt-1} = \beta_d + \lambda_t + \gamma\, fclose35_{dt-1} + \zeta close35_{dt-1} + X_{jdt}\delta + Z_{dt}\theta + \varepsilon_{dt} \qquad (4.3)$$

$female_{dt-1}$ is the fraction of seats in the state that were won by female politicians in the election held at least a year before survey was conducted. As the mean difference test for district and election years that had close elections show significant difference in some characteristics, it becomes crucial to include the proportion of seats in the district which had close elections between men and women, $close35_{dt-1}$ as one of the controls in 2SLS.

The instrument for this variable is proportion of female politicians winning in close elections in the district at 3.5% margin of victory. The state election data gives information on sex of all the contesting candidates from all constituencies and votes received by all the candidates. Using this

constituency-wise data, I determine the sex of the winner and runner-up, the vote-share received by the winner and the runner-up and hence the margin of victory. If seat is won by a female candidate, the runner up is a male candidate and victory margin is less than 3.5 percent it gets included in the instrument. And, if the victory margin is 3.5 percent and the winner and runner up are of the opposite sex then it gets added in the control for proportion of close elections in the district. For the election years, I use female representation as it was in the previous elections, under the assumption that choice and implementation of new policies take time. Moreover, this controls for the fact that some of the elections are after the survey was conducted.

The fitted values obtained from regressions 4.3 is plugged into 4.4 to determine unbiased causal effect of female state legislators on the women's bargaining position within the household. The second stage specification is given below:

$$dm_{jdt} = \alpha_j + \theta_t + \beta_1 female_{dt-1} + \beta_2 close35_{dt-1} + X_{jdt}\gamma + Z_{dt}\delta + \mu_{jdt} \qquad (4.4)$$

$close35_{dt}$ stands for fraction of seats which had close election between male and female contestants at 3.5 percent margin in district *d* in year *t-1*. The fraction of man woman close elections in a district, regardless of the gender of the winner is used as a control in two stage least square estimation. This is because the winner of close elections can be considered random but the fact that some districts and election years see close elections between men and women may not be random). The necessity of using overall fraction of close elections in a district has also been proved by the external validity tests in Table 10. District and electoral years which saw at least one close election between a man and a woman differ significantly from district and electoral years which saw no close elections on more than one district level characteristic. So for unbiased estimation of

the effect of share of female state politicians in a district on the two outcomes of autonomy we need to use the instrument and also control for the overall share of close elections in the district.

4.4.2 Effect of Female Village Pradhan

Empirical Model

To estimate the effect of the gender of the village head on the involvement of the eligible women in the decision making process of the household, I use the information on gender relations section of the second round of IHDS only for rural households. Using an empirical model similar to Chattopadhyay and Duflo (2004), I test if the VP being female leads to higher bargaining power for women in the village. The simple empirical model to test this conjecture is given below.

$$dm_{jvd} = \alpha_d + \beta femaleVP_{vd} + X_{jvd}\gamma + V_{vd}\rho + \mu_{jvd} \qquad 4.5$$

The subscript j stands for the j^{th} respondent being interviewed living in village v of district d at the time of IHDS second round. The above equation is estimated for involvement in making decisions of purchase and fertility. *femaleVP* is an indicator variable that takes value 1 if the Village Pradhan living of village *v* of district *d* is female. *X* and *V* represent the individual level and village level controls included in the model. α_d stands for the district level fixed effects that have been included in the model. In the village dataset, 549 out of 1382 villages i.e., 39.7% have female village Pradhan. But, only 392 are reserved seats. So for the remaining 157, i.e., 29% of villages with Village Pradhan there can be a problem of voter preference. When the seat is reserved for women, the sex of the VP is exogenously given but it is not the case when a female VP gets elected without any reservation. Hence using a dummy for a female VP as an explanatory variable might lead to

biased results in a simple OLS model. To get rid of this possible endogeneity I use the dummy for the seat being reserved for women as an instrument.

Estimation using 2SLS

In the first stage regression the dummy variable indicating the sex of the Village Pradhan is regressed on the dummy for the seat of VP being reserved for women and the other explanatory variables in the equation. The specification is given below.

$$femaleVP_{vd} = \alpha_d + \beta VPreserved_{vd} + X_{jvd}\delta + V_{vd}\theta + \varepsilon_{jvd} \qquad 4.6$$

VPreserved is an indicator that takes value 1 when the seat of Village Pradhan is reserved for women. The reservation of the seat of the VP for women is not dependent on any village or state level variable. Instead it happens so in every third election, and these brings a complete randomization into the policy. So the validity of the instrument establishes itself. Since this reservation is mandatory and determined exogenously in the system, its use an instrument for female VP can expected to generate unbiased coefficients thus helping to determine the causal effect a female local leader has on the household bargaining position of women living in the locality.

The fitted values from estimation of the above specification is then plugged into 4.5 to obtain unbiased estimates of the female Village Pradhan on the involvement of women of the village in various decision making process.

4.5. Results

4.5.1 Effect of female state politicians

To explore the effect of female representation in state assembly from a district on the women's bargaining power in the household, I used linear regression model. Specification 4.4 has been estimated for involvement of women in the decisions of purchase of expensive durable items and fertility using Instrumental Variable Two Stage Least Square in fixed effect model.

For the panel data analysis, I combined the data collected in two rounds of IHDS. The survey had a recall rate of 83% on the household interviewed. The number of eligible women who were interviewed in both the rounds and had valid data was 25476. Change in marital status changes the household dynamics which I am not considering in this study. For the analysis I took only those women who the same marital status in both the rounds of survey, and if they were married, their husband's id was matching. I use the data on eligible women reported age, her husband's reported age, her level of schooling, her husband's level of schooling, the age at which she starts living with her husband, sex of her first born and her fertility history to match record. These brought down the relevant number of cases to over 16000 in both rounds so a bit more than 32000 overall. Even though here is loss of information due to this filtering the sample size is good.

I used fixed affect model for the analysis of this panel, which helps in eliminating unobserved household fixed effects. Due to concerns of existence of voter preference, which could bias the results, I used IV 2SLS estimation in Stata for estimation of specification 4.4. Fixed effects probit estimates are not consistent in short panels (Nickell (1981)) and the panel here is a micro panel where the two rounds of survey determine T = 2.

Column 1 of table 11 and table 12 show regression of involvement of the respondent in decision making. Estimate of the linear probability version of specification 4.4 are reported by columns 2,

3 & 4 of Table 11. Column 2 gives the estimate of the fixed effect model using 2OLS i.e. without using any instrument. Column 3 uses the fraction of female politicians in the district, who won in close elections against male contestants (3.5 percent vote margin) as the instrument for overall share of women politicians from the district. Column 4 adds the control for overall share of seats which saw close elections (3.5 percent vote margin) between men and women in the district.

Table 11 shows the results of regression of involvement of women in decisions of purchasing expensive durables like refrigerator, television, etc. Column 2 shows that an increase in proportion of female politicians by one standard deviation (0.1006) increases the probability of involvement of the women in the district in making purchase decisions by 0.75 percent. The coefficient is significant at 5 percent. But as discussed earlier this result can be biased because of voter preference. Column 3 shows an increase in the coefficient of share of female politicians by over 9 times. After the use of the instrument a unit increase in standard deviation in the share of female politicians increases the probability of involvement of women in purchase decisions by 6.8 %. In column 4 when the overall share of close elections in the district is added the coefficient decreases in size, now increasing the probability of involvement by 5.3 percent. Results reported in column 3 & 4 are both significant at 1 percent.

I restrict the sample further for the analysis of effect of female state politicians on fertility decisions. The sample contains women of age up to 60. Even though this particular section of the survey was meant for women of age 15 to 49, some of the women whose age was close to 49 were interviewed in the first round and during the second round their age was close to 60, and the survey did not drop this women. For decisions of fertility, involvement of women of age 50 or higher doesn't make sense as most of them would have reached menopause by that age recollection of

what happened when they were of child bearing age may not always be accurate. Thus the data on only those women who reported their age to be 45 or lower in the second round of the survey.

Table 12 shows the results of regression of involvement of women in deciding how many children they should have. Column 2 shows that an increase in proportion of female politicians does not cause any significant increase in the probability of involvement of women in decisions related to fertility, but the coefficient is positive. Column 3 shows that one standard deviation increase (0.1003) in the share of female politicians from the district increases the probability of involvement of the women of the district in the decisions of fertility by 5.9 percent. In column 4 when the overall share of close elections in the district is added the coefficient decreases in size, now increasing the probability of involvement by 3.8 percent. Results reported in column 3 & 4 are both significant at 1 percent.

The results show that the OLS coefficients are smaller in size than the 2SLS coefficients. This generally happens because of two main reasons: measurement error or heterogeneous treatment effect. The chances of measurement error are very small given that the data on female politicians and the vote margin are given by the Election Commissions of India is published on their website and easily verifiable. And even if there are chances of measurement error the fixed effect model should reduce these errors by differencing. Bhalotra and Clots-Figueras (2014) Clots-Figueras (2011)- also get similar results. Bhalotra and Clots-Figueras (2014) in their paper investigate the effect of the share of female state politician on the neo-natal mortality in the district from which they are elected. She argues that women politicians are more likely to be elected in districts which have poorer baseline health. In my study even though I don't look at any health variables, I can project her argument because generally districts with poorer baseline health are expected to have other poor indicators like low female literacy rate or low female labor force participation rate. It

could be the case that women are elected or they come forward from districts where the positions of women in the society is relatively poor.

The size of the average treatment effect and the local average treatment effect identified with the help of an instrument generally depends on the underlying theoretical model. These results are consistent with the citizen candidate model and cannot be reconciled with models like median voter model. Rehavi (2007) in her paper studies the effect of female state politicians in the US on the state expenditure pattern using close election as an instrument. She argues that female politicians who win against men in the close elections make policy choices that are fundamentally very different from the male politicians who win in close elections against women. Also her policy choices are different from an average female office holder. Rehavi (2007) paper further shows that women who were elected in close elections have a larger effect on state spending priorities than the female politicians whose elections weren't close.

Hence with these models providing the theoretical framework, it is not difficult to understand that when the share of female state politicians is identified with the help of women who won in close elections, the coefficient is larger and more significant. It is quite probable that women who have won in close races against men make policy choices that increases the bargaining power of her female electorate by significantly larger amount than the politicians who have won with big vote margin.

Other district level variables included in the analysis are the literacy rate in the district, the share of population living in rural areas of the district, the proportion of district population that belongs to backward caste and tribe (SC/ST) and the proportion of female population that is a part of the workforce. These variables have been included to control for the change in other social and demographic indicators of the district between the two rounds of survey. The empirical models

also control for change in a few household characteristics that may have occurred between the two rounds, which can potentially change the bargaining position of the women within the household, and may be related to the district level share of female politicians. These variables include indicator variable like presence of the mother in law in the same household, whether the respondent is the wife of head of the household, whether the women have given birth to a son, whether the respondent is working for wages. Year fixed effects have also been included in the model to control for the nationwide shocks in the year of interview on the bargaining outcomes.

Policy Effect

Kalsi (2013) argues that the effect of female politicians on sex selection in rural India can be explained mostly by a role model effect. Other papers like Clots-Figueras (2011), Bhalotra and Clots-Figueras (2014) argue that effect of female state politician on family, child and health outcome variables is mostly policy effect. In the view of these conflicting explanations of how state politicians affect various outcomes, it is important to see the channels through which the state politicians are having a positive effect on the household decision making power of women. To study this, I include the gap between the year the survey was conducted and the year in which the election was held as an additional control in specification 4.4. The gap varies between 1 year and 6 years depending on the timing of the interview. The coefficient on the gap is positive and significant for the regression of the involvement of women in purchase decisions but not significant for fertility decisions. The effect on involvement in purchase decision seems to be a policy effect whereas involvement in fertility decision seems to be more of a role model effect. It could also depend on the fact that the decision of purchasing a durable is made more frequently and does not depend on other factors like age of the respondent and her spouse, number of other

children, etc. The effect of state politicians is robust to the inclusion of the gap. The results are reported in table 13.

Robustness checks

For robustness, the IV-FE analysis of column (4) in tables 11 and 12 are repeated with vote-margins of 3,4 and 5 percent. The results of the regression show that the coefficients are significant for regression of both purchase decisions and fertility decisions. This shows that the results are robust to change in definition of a close election.

4.5.2 Effect of female Village Pradhan

To investigate the effect of local level leadership on the intra household decision making power of women I estimate equation 4.5 using OLS and 2SLS. Papers like Chattopadhyay and Duflo (2004) show that a female village head is more responsive to the demands of the women of the locality than a male village head. This paper shows that when a village has a female chief the expenditure pattern is more inclined towards the public goods which typically women care about, like sanitation, drinking water etc. Their findings are in line with the predictions of the Citizen Candidate Model.

Table 16 reports the coefficient of regression of involvement of women in the decisions of purchase or expensive durable items on the sex of the village head. Column 1 of table 16 gives the OLS estimates of the equation 4.5. It shows that if the VP is female, then it increases the probability of involvement of women in the decisions of purchase of expensive durable items by 2.5 percent. The coefficient is significant at 1 percent. This estimate is probably biased because not every village head is female because of reservation. The process of selection of VP keeps room for the

village head being female even without reservation as the VP is chosen by the elected members of the village from amongst themselves. This could probably happen if the elected members, who ultimately represent the people of the village, have a preference for a female head. Column 2 of table 16 gives the OLS estimate of equation 4.5, but instead of the dummy for a female VP, it uses the dummy for the seat of the VP being reserved for women. The coefficient on the explanatory variable increases in size and is significant at 1 percent. When the seat of the VP is reserved for women, it increases the probability of involvement of the respondent in purchase decisions by 3 percent. Column 3 of table 16 reports the 2SLS estimates of equation 4.4. The gender of the VP is instrumented by the seat of the VP being reserved for women in column 3. After instrumenting the size of the coefficient increases further to 0.0357 implying that when the gender of the female Pradhan is purged off the voter preference bias with the use of the reservation policy, having a female VP, increases the probability of women's involvement in purchase decisions by 3.5 percent.

The estimates of regression of involvement of women in fertility decisions on the sex of the VP is given in table 17. Column 1 of the table gives the OLS estimates of the equation 4.5. It shows that the probability of involvement of women in fertility decisions significantly increases by 1.67 percent when the village she is living in has a female head. The p-value of the coefficient is less than 0.01. As in the case of purchase decisions this estimate is probably also biased as there could a preference for a female VP in the village. Column 2 of table 17 gives the OLS estimate of equation 4.5, but instead of the dummy for a female VP, it uses the dummy for the seat of the VP being reserved for women. The coefficient on the explanatory variable decreases in size but is still significant at 1 percent. The value of the coefficient is 0.013 implying that having the seat of the VP reserved for a woman leads to increase in the probability of involvement of the respondent in fertility decisions by 1.3 percent. Column 3 of table 17 reports the 2SLS estimates of equation 4.5.

The gender of the VP is instrumented by the seat of the VP being reserved for women in column 3. After instrumenting the size of the coefficient decreases from 0.017 in OLS to 0.015, implying that when the gender of the female Pradhan is instrumented with the use of reservation policy, it increases the probability of women's involvement in fertility decisions by 1.5 percent.

There is a significant difference between the OLS and 2SLS estimates of the purchase decisions. The Citizen Candidate Model can probably be used to explain this gap. Also, these villages are probably the ones where women do not have much bargaining power to begin with. If the assumption, that a woman is elected to the seat of VP only due to reservation policy is true for a village, it means that there isn't any preference for female leaders in the village. So when such villages get a female VP she may act she may choose public projects which benefit women more. Even though the fund allocated for the public policy programs come from the state government, the VP can choose which public projects to undertake. The VP thus has discretionary power and can make a difference by choosing projects where more women can be employed under an employment scheme like MNREGA (Ghani, Mani et al. (2013)). Using public employment schemes, the labor force participation of the women living in the village can be easily increased and as the second chapter shows, change in employment status can lead to a significant increase in purchase decisions.

The coefficient for the fertility decisions behave in the usual way, i.e., 2SLS coefficient is smaller than the OLS coefficient. This could be because through expansion in employment opportunities women's involvement in purchase decisions can be targeted easily but this may not have much effect on the fertility decisions as it is mostly a household specific variable.

Effect of the female state politicians and female village head

To explore the effect of female representation in State Assembly from a district on the women's bargaining power within the household, I do a cross-sectional analysis as per specification 4.1 with some added village characteristics. I do the cross-sectional analysis using OLS and 2SLS. The IV-2SLS estimation has been done using the instrument of proportion of seats won by women in close elections against men (3.5 percent vote margin) as earlier.

My main aim here is to see if the share of the female state politicians in a district continues to significantly increase the women's bargaining power within the household when the local leadership is under a woman. For this analysis I use only the data from 2011-12 round of IHDS as only the second round mentions the gender of the VP. I have included only those women who reported to be married at the time of interview. The reason I did not include the women who are either separated divorced/separated/widowed at the time of the interview is because the dynamics in a married household is very different from the dynamics of the household the women is single. Also I only include those women who have either not migrated to their current residence or if they have, they have migrated from the same district. The reason I do not include the women whose families have migrated from other district, state or country is because if the place from where they migrated has a different environment from the one where she is currently living, it could cause omitted variable bias. Also, the dataset does not contain information on where the family is migrated from. As earlier with the panel analysis the sample of women considered for involvement in fertility decisions are of age 45 or below.

Table 18 shows the estimates of the regression of involvement of women in decisions of purchase of expensive durable items. Column 1 & 2 of table 18 show the OLS and 2SLS estimates for the entire rural sample respectively. Column 3 shows the estimates for a restricted sample of villages where the seat of the VP was reserved for a woman. Column 1 shows that an increase in the share

of female representation in state legislature from the district by one standard deviation (0.112) increases the probability of women's involvement in decision for purchases by 0.6 percent. The coefficient is significant at 5 percent. But these results are biased due to presence of voter preference. On instrumenting the size of the effect increases, now increasing the probability by 4 percent. The coefficient increases slightly more when the sample is restricted to only those villages where the seat of the VP is reserved for women. Coefficients reported in both column 2 and 3 are significant at 1%.

Table 19 shows the estimates of the regression of involvement of women in decisions of fertility. Column 1 & 2 of table 19 show the OLS and 2SLS estimates for the entire rural sample respectively. Column 3 shows the estimates for a restricted sample of villages where the seat of the VP was reserved for a woman. Column 1 shows that an increase in the share of female representation in state legislature from the district by one standard deviation (0.112) increases the probability of women's involvement in decision for purchases by 1.06 percent. But these results are biased due to presence of voter preference. The coefficient is significant at 1 percent. Due to presence of endogeneity die to voter preference these estimates cannot be trusted. On instrumenting the size of the effect increases by more than 2 times now increasing the probability of involvement in purchase decisions by 2.34 percent. The coefficient decreases slightly when the sample is restricted to only those villages where the seat of the VP is reserved for women. Coefficients reported in both column 2 and 3 are significant at 1%.

The estimates of regression for both the purchase decision and fertility decision show that the share of female politicians at the village level have a positive significant effect on the bargaining power of women living in the village where the seat of VP is reserved for women. This shows that the female political representation at both higher and lower level are significant separately, but they

are also significant in increasing the bargaining power of women when both the position are occupied by women. This result also acts as a robustness check for the effectiveness of female state politicians, because even after controlling for the gender of the head of the village, they still have a positive effect on the position of other women in society.

4.6 Conclusion

The literature on intra-household allocation has mostly focused on the role played by individual level factors, such as education, employment, having a son, access to property etc., in empowering women. But for a patriarchal society like India where the gender norms are so skewed in favor of men that for any individual level improvement to have effect on the position of women is difficult. In this chapter I thus look at the effect of political participation of women on the bargaining position of women in the society.

I look at political participation at both state and local level governments. Presence of women at both the levels play an important role in increasing the bargaining power of women within the household. Female participation in politics in India has shown an upward trend, however the number of female political representatives are still very low.

India already has mandatory reservation for women in local governments. Also a bill for reservation of women in the state and center legislature is awaiting clearance. These results of this chapter make a stronger case for passing the women reservation bill, thereby increasing female participation in politics at all level.

Chapter 5

Conclusion

In my dissertation I show that increase in labor force participation of women can lead to significant increase in her involvement in making household decisions. This can be seen as an increase in her bargaining power within the household. In India the literacy rate and the average years of schooling for women is very low. So to empower women through labor force participation would require launching of mass employment schemes to give her opportunities of employment in jobs which does not require skilled labor. Currently, most women who work for wages are casual labors and are highly underpaid. They work mostly in the informal sector which does not follow the minimum wage set by the national and state governments. Also these jobs are mostly seasonal, so the number of days of employment is less. When jobs are provided by launching of mass employment schemes by the government, there is generally a guarantee of a minimum wage and days of employment, which is fixed by the government. These jobs provide a minimum standard of living. This can be seen as short term measure, however the long term goal should be an increase in female literacy rate and skilled labor.

A big difference between the first and the second round of IHDS is the launch of MGNREGA. It guarantees 100 days of employment in rural areas to any individual who is willing manual work. This is probably one of the largest employment schemes launched by government of any nation. The results of a positive impact of labor force participation could be because of the expansion in labor market opportunities for women caused by MGNREGA.

The positive effect of presence of female politicians, point towards the fact that women policymakers not only help in improving social indicators like health and education outcomes in

the society, but they also improve the bargaining position of women. The results show that there is a positive effect of female state legislators and female village head. The effect of female state politicians in conjunction with the female village head is also positive. This shows that women policymakers at all levels work towards empowerment of women in the society. One of the ways female state legislators can improve the position of women in the society is by choosing policies which favor women. Female political representative at the local level can contribute significantly towards the same by better implementation of the policies chosen by the legislators at higher levels of government. Since voter preference in India is biased against women, making reservation for women in state and central legislatures would increase the number of female policymakers. This can be achieved by passing the women reservation bill which is stuck in Lok Sabha since 2010.

My study shows that in patriarchal societies like India, improvement in individual and household level characteristics should be backed by changes in variables that can affect the existing gender norms. In India there are many cash transfer programs, which are mainly directed towards women welfare. While cash transfers to women may have a positive effect on outcomes like maternal and child health, children education, a true empowerment can happen only by expansion of her capabilities. Thus policies should be directed towards achieving it.

Figure 1: Administrative Structure of India

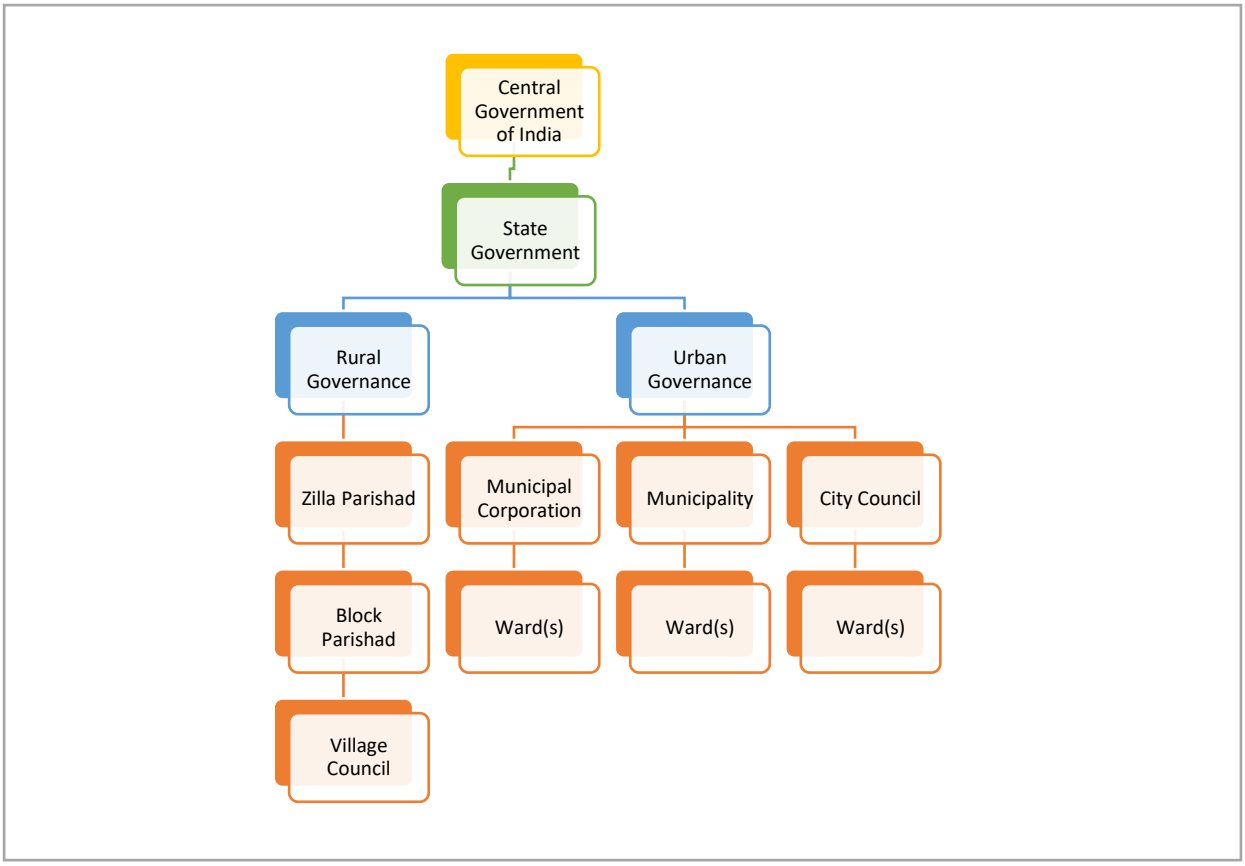

Figure 2: Increasing share of female state legislators (red to green)

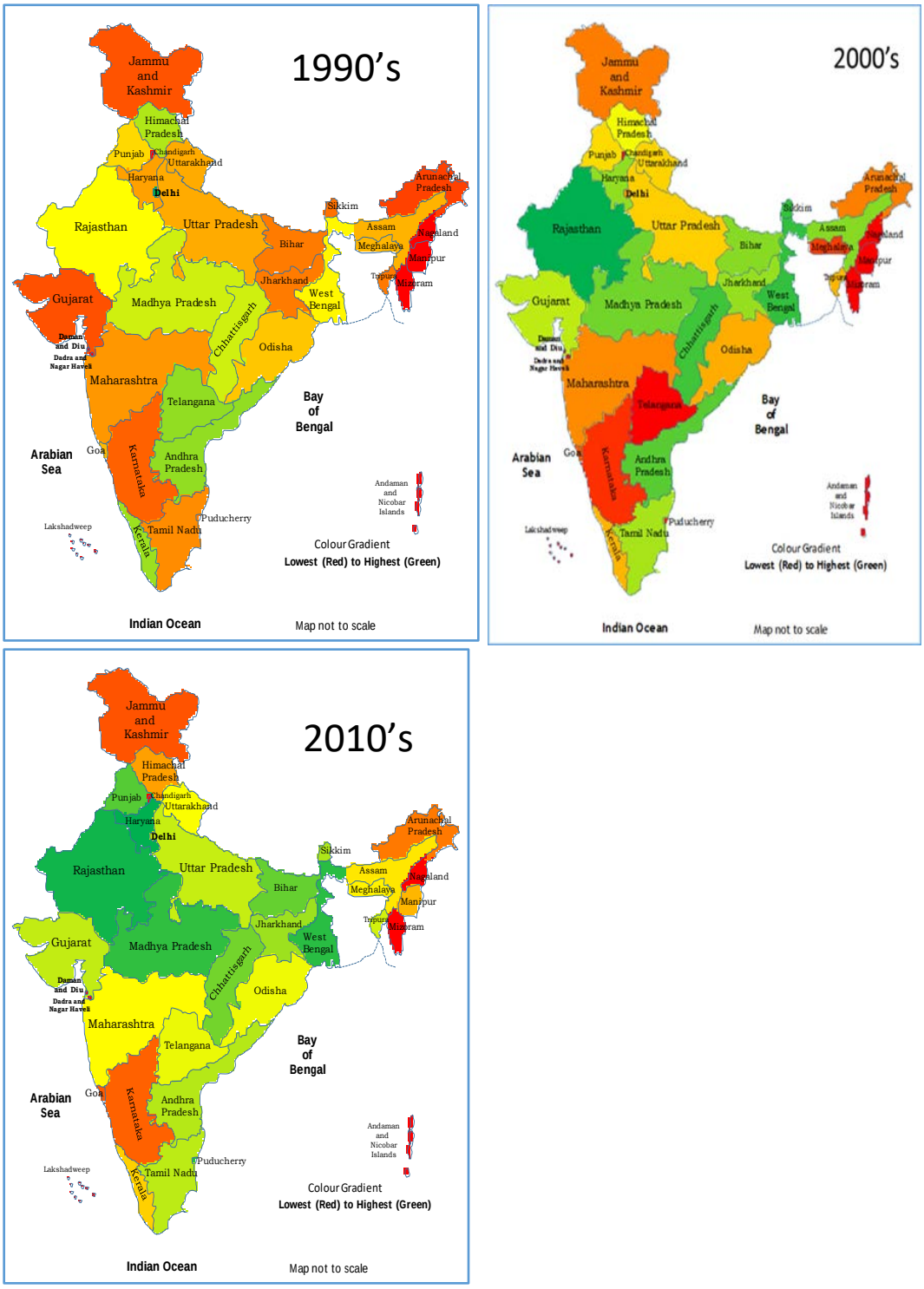

Figure 3: Trend of share of female state legislators by state (1980s to 2010s)

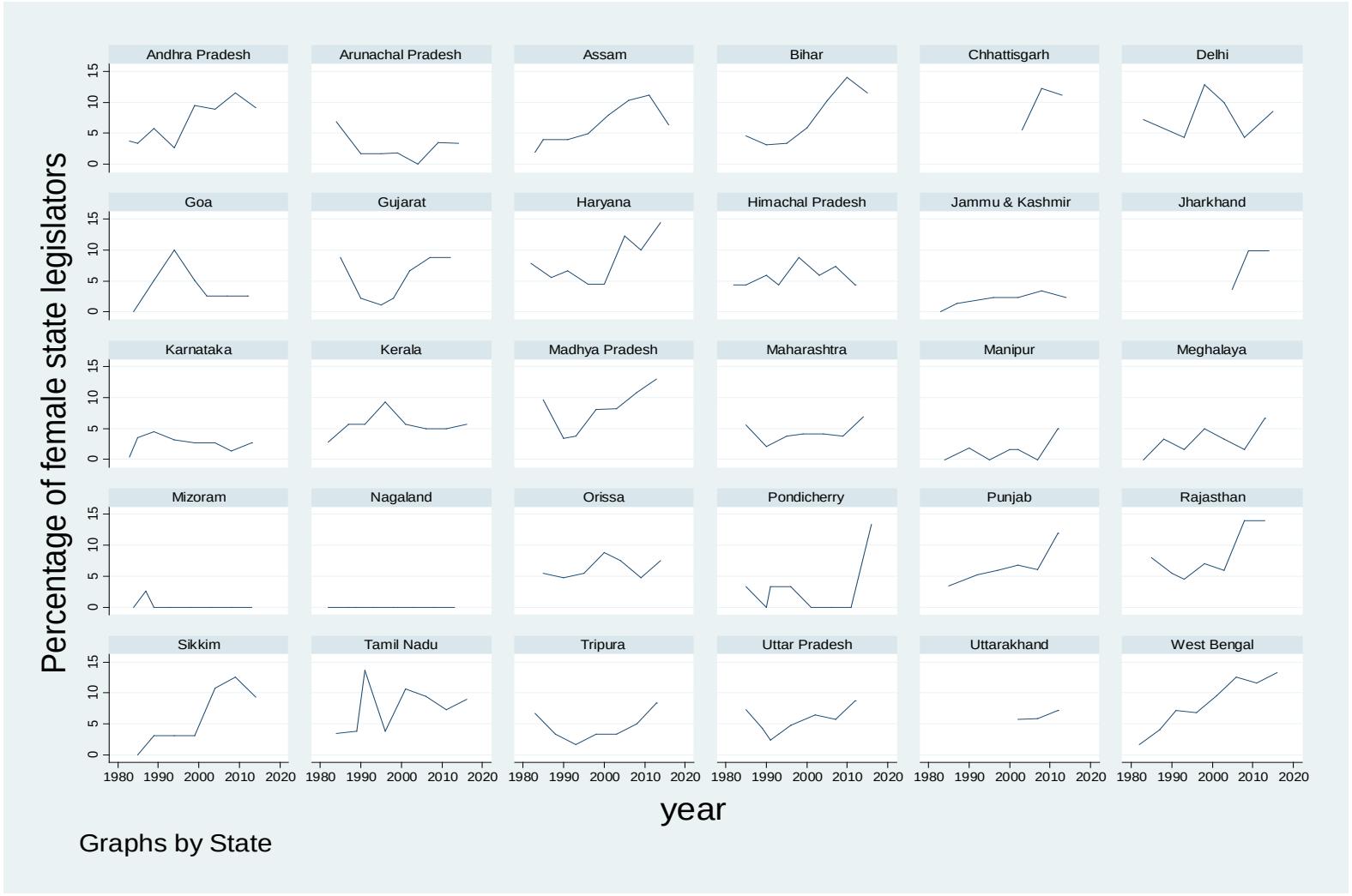

Table 1: Descriptive Statistics of Eligible Women (Entire Sample), Rounds 1 and 2

Unit of observation: Eligible woman	Round 1	Round 2
Variable (eligible woman and household characteristics)		
Age	33.02	36.34
	(7.98)	(9.86)
Relation to head of the household (wife)	0.72	0.65
	(0.45)	(0.48)
Literacy	0.56	0.61
	(0.49)	(0.48)
Years of schooling	4.63	5.17
	(4.8)	(4.9)
Years since the respondent has been married	15.14	18.06
	(8.42)	(10.56)
Number of children	2.61	2.83
	(1.55)	(1.84)
Had at least one son	0.79	0.81
	(1.15)	(0.39)
Had at least one daughter	0.72	0.73
	(0.45)	(0.44)
Number of sons	1.35	1.47
	(1.04)	(1.16)
Number of daughters	1.26	1.36
	(1.17)	(1.30)
Mother in law lives in the same household	0.29	0.34
	(0.45)	(0.47)
Brahmins	.05	0.05
	(0.23)	(0.22)
General Category	0.27	0.17
	(0.44)	(0.37)
Other Backward Caste (Mostly backward Hindus)	0.39	0.34
	(0.488)	(0.47)
Scheduled Caste	0.204	0.214
	(0.40)	(0.41)
Scheduled Tribes	0.078	0.082
	(0.27)	(0.27)
Muslim	0.12	0.12
	(0.32)	(0.32)
Other Religions	0.06	0.056
	(0.24)	(0.23)
Variables (Autonomy variables)		
Involved in cooking decision	0.94	0.93
	(0.23)	(0.26)
Involved in purchase of expensive durables	0.71	0.77
	(0.45)	(0.42)
Involved in fertility decisions	0.81	0.92
	(0.39)	(0.26)
Involved in the decision of what to do when EW falls sick		0.85
		(0.35)
Involved in the decision of buying land/property		0.75
		(0.43)
Involved in the decision of how much to spend in social function (wedding present etc.)		0.802
		(0.399)
Involved in the decision of what to do when EW's children fall sick	0.86	0.90
	(0.35)	(0.29)
Involved in the decision of who EW's children get married to	0.79	0.88
	(0.40)	(0.32)
Number of observations	33482*	39276*

Figures in parenthesis report standard deviation. *Number of observations for some variables is less than the sample size because of missing data

Table 2: Descriptive Statistics of Eligible Women (Estimation Sample), Rounds 1 and 2

Unit of observation: Eligible woman	Round 1	Round 2
Variable (eligible woman and household characteristics)		
Woman has given birth to at least one son	0.82	0.91
	(0.38)	(0.28)
Woman has given birth to at least one daughter	0.75	0.81
	(0.44)	(0.39)
Number of children	2.94	3.38
	(1.76)	(1.7)
Mother-in-law lives in the same households	0.32	0.27
	(0.47)	(0.44)
Respondent works for wages	0.25	0.32
	(0.43)	(0.47)
Respondent involved in works of animal husbandry	0.35	0.42
	(0.48)	(0.49)
Respondent working on household farm	0.31	0.46
	(0.46)	(0.5)
Respondent working on non-farm business	0.05	0.06
	(0.21)	(0.25)
Respondent involved in cooking decision	0.94	0.95
	(0.23)	(0.21)
Respondent involved in decisions related to purchase of expensive durable	0.7	0.8
	(0.46)	(0.4)
Respondent involved in decisions related to fertility	0.8	0.92
	(0.4)	(0.27)
Respondent involved in decision of what to do when children fall sick	0.85	0.91
	(0.35)	(0.28)
Respondent involved in the deciding who their children should get married to	0.79	0.89
	(0.41)	(0.32)
Number of observations	17723	16135

Figures in parenthesis report standard deviation

Table 3:District level characteristics in Census, 2001 and 2011

Unit of Observation: District	**2001 Census**	**2011 Census**
Male literacy rate	0.64	0.71
	(0.1)	(0.09)
Female literacy rate	0.46	0.58
	(0.14)	(0.12)
Share of working males in total male population	0.52	0.54
	(0.04)	(0.05)
Share of working females in total female population	0.28	0.28
	(0.12)	(0.11)
Share of working males in total male population (not including casual/marginal laborers)	0.45	0.61
	(0.06)	(0.14)
Share of working females in total female population (not including casual/marginal laborers)	0.16	0.16
	(0.09)	(0.09)
Proportion of SC/ST (socially backward groups) in total district population	0.27	0.28
	(0.16)	(0.17)
Proportion of district population living in rural areas	0.73	0.69
	(0.21)	(0.22)
Number of observations	413	388

Figures in parenthesis report standard deviation

Table 4: Regression of purchase decisions on labor force participation

Unit of observation: Eligible women	(1)	(2)	(3)
Respondent working for wages	0.019***	0.043***	0.091***
	(0.007)	(0.01)	(0.014)
Respondent working on household farm	-0.02***	-0.024**	-0.025*
	(0.007)	(0.011)	(0.013)
Respondent working on non-farm business	-0.016	-0.059***	-0.051**
	(0.013)	(0.017)	(0.02)
Respondent taking care of livestock	-0.024***	0.004	0.003
	(0.007)	(0.01)	(0.012)
Mother in Law lives in the same house	-0.046***	-0.039***	-0.043***
	(0.008)	(0.013)	(0.015)
Respondent has given birth to at least one son	-0.004	0.006	0.014
	(0.01)	(0.019)	(0.022)
Respondent is the wife of the head of the household	0.145***	0.073***	0.074***
	(0.012)	(0.019)	(0.021)
Male literacy rate of the district	0.233*	-2.148***	-2.291***
	(0.13)	(0.416)	(0.487)
Female literacy of the district	-0.004	0.105	-0.007
	(0.092)	(0.306)	(0.355)
Share of working female in total female population in the district	0.496***	2.1***	2.094***
	(0.037)	(0.119)	(0.135)
Share of SC/ST population in the district	0.045*	-1.503***	-1.441***
	(0.026)	(0.203)	(0.22)
Share of population living in the rural areas of the district	-0.075***	0.268***	0.342***
	(0.02)	(0.098)	(0.107)
Regression Model	OLS	FE	FE
Number of Observations	15711	31682	23855

Figures in parenthesis report robust standard error, * significant at the 10%, **significant at the 5%, ***significant at the 1%.. Time dummy for the year of interview has been included in the model.

Table 5: Regression of fertility decisions on labor force participation

Unit of observation: Eligible women	(1)	(2)	(3)
Respondent working for wages	0.013**	0.026***	0.081***
	(0.006)	(0.009)	(0.013)
Respondent working on household farm	-0.002	0.006	0.007
	(0.006)	(0.01)	(0.012)
Respondent working on non- farm business	-0.014	-0.042**	-0.026
	(0.011)	(0.016)	(0.018)
Respondent taking care of livestock	-0.001	0.014	0.006
	(0.006)	(0.009)	(0.01)
Mother in Law lives in the same house	-0.006	-0.006	-0.015
	(0.006)	(0.012)	(0.013)
Respondent has given birth to at least one son	0.006	0.016	0.038**
	(0.008)	(0.016)	(0.018)
Respondent is the wife of the head of the household	0.016**	0.015	0.011
	(0.008)	(0.015)	(0.017)
Male literacy rate of the district	0.624***	-0.983***	-1.196***
	(0.102)	(0.37)	(0.429)
Female literacy of the district	-0.309***	-0.577**	-0.531*
	(0.071)	(0.274)	(0.309)
Share of working female in total female population in the district	0.071**	1.218***	1.087***
	(0.029)	(0.102)	(0.115)
Share of SC/ST population in the district	0.088***	-0.37*	-0.352*
	(0.019)	(0.19)	(0.206)
Share of population living in the rural areas of the district	0.034**	0.095	0.093
	(0.017)	(0.096)	(0.103)
Regression Model	OLS	FE	FE
Number of Observations	11747	23222	17484

Figures in parenthesis report robust standard error, * significant at the 10%, **significant at the 5%, ***significant at the 1%.. Time dummy for the year of interview has been included in the model.

Table 6:Descriptive Statistics of the villages that were interviewed in the second round of IHDS (2011-12)

Unit of observation: Village	
Number of hamlets in the village	3.81
	(4.77)
Percentage of Brahmins in village	5.17
	(11.86)
Percentage of people belonging to forward castes in the village	20.12
	(25.94)
Percentage of people belonging to Other Backward Castes in the village	40.73
	(29.49)
Percentage of people belonging to the Scheduled Castes in the village	20.48
	(17.71)
Percentage of people belonging to Scheduled Tribes in the village	11.98
	(24.76)
Percentage of people belonging to other castes	1.52
	(7.56)
Percentage of Hindus in the village	82.85
	(28.09)
Percentage of Muslims in the village	9.17
	(20.5)
Percentage of Christians in the village	2.97
	(12.62)
Percentage of Sikhs in the village	3.05
	(15.46)
Percentage of Buddhists in the village	0.89
	(4.62)
Percentage of Jains in the village	0.06
	(0.76)
Percentage of Tribal population in the village	0.81
	(6.51)
Percentage of people belonging to other communities in the village	0.22
	(3.12)
Percentage of villages with female Village Pradhan	0.4
	(0.49)
Percentage of villages where seat of the Village Pradhan is reserved for women	0.29
	(0.45)
Percentage of villages with seat of Village Pradhan reserved for SC/ST	0.2
	(0.4)
Number of observations	1380

Figures in parenthesis report standard deviation

Table 7: Descriptive Statistics of the state election outcomes before the survey was conducted

Unit of observation: District in election year	Round 1	Round 2
Variable (eligible woman and household characteristics)		
Female Winner District Proportion	0.071	0.081
	(0.112)	(0.12)
Female Contestant District Proportion	0.064	0.074
	(0.045)	(0.041)
Proportion of seats in a district that had close election between men and women (2.5 % vote margin)	0.017	0.022
	(0.048)	(0.077)
Proportion of seats in a district that had close election between men and women (3 % vote margin)	0.022	0.027
	(0.055)	(0.081)
Proportion of seats in a district that had close election between men and women (3.5 % vote margin)	0.025	0.030
	(0.059)	(0.083)
Proportion of seats in a district that had close election between men and women (4 % vote margin)	0.028	0.036
	(0.061)	(0.087)
Proportion of seats in a district that had close election between men and women (5 % vote margin)	0.032	0.041
	(0.069)	(0.091)
Proportion of seats in a district where women won against men in close elections (2.5% vote margin)	0.009	0.011
	(0.033)	(0.06)
Proportion of seats in a district where women won against men in close elections (3% vote margin)	0.011	0.013
	(0.037)	(0.063)
Proportion of seats in a district where women won against men in close elections (3.5% vote margin)	0.013	0.015
	(0.042)	(0.065)
Proportion of seats in a district where women won against men in close elections (4% vote margin)	0.014	0.016
	(0.043)	(0.066)
Proportion of seats in a district where women won against men in close elections (5% vote margin)	0.017	0.019
	(0.05)	(0.07)
Proportion of seats won by Congress parties in a district	0.301	0.280
	(0.281)	(0.267)
Proportion of seats won by Soft Left parties in a district	0.083	0.105
	(0.177)	(0.226)
Proportion of seats won by Hard Left parties in a district	0.040	0.061
	(0.14)	(0.188)
Proportion of seats won by Right of Center parties in a district	0.017	0.013
	(0.101)	(0.081)
Proportion of seats won by Hindu Right parties in a district	0.262	0.242
	(0.295)	(0.297)
Proportion of seats won by Regional parties in a district	0.212	0.189
	(0.287)	(0.284)
Proportion of seats won by Others parties in a district	0.044	0.079
	(0.131)	(0.2)
Voter turnout in the district	0.647	0.660
	(0.094)	(0.117)
Male voter turnout in the district	0.678	0.674
	(0.092)	(0.111)
Female voter turnout in the district	0.613	0.645
	(0.104)	(0.128)
Number of observations	416	399

Figures in parenthesis denote standard deviation

Table 8: Probability of women winning in close elections against men in close elections (1998 – 2011)

Dependent variable: proportion of women who won in a close election against a man in a district-election year Unit of observation: District and election year. Sample 1998-2011 Sample with close elections.	
Proportion of seats won by Congress parties	-0.019
	(0.163)
Proportion of seats won by Soft Left parties	-0.143
	(0.156)
Proportion of seats won by Hard Left parties	-0.124
	(0.126)
Proportion of seats won by Hindu Right parties	-0.097
	(0.123)
Proportion of seats won by Regional parties	-0.144
	(0.127)
Proportion of seats won by parties with Others affiliation	-0.218*
	(0.123)
Turnout in the elections	-0.367
	(0.226)
Share of district population living in rural areas	0.067
	(0.046)
Share of district population belonging to SC/ST category	0.257
	(0.185)
Literacy rate in the district	-0.218
	(0.137)
Proportion of seats that had close elections in the previous election	0.07
	(0.153)
Proportion of seats won by women in the previous election	-0.013
	(0.114)
Number of observations	152

Robust standard errors are reported in parentheses. * significant at the 10%, **significant at the 5%, ***significant at the 1%.

Table 9: Mean comparison test of close election won by men and women

Unit of Observation: District in Election year Sample: District in election year that had close elections (1998 – 2011)	
Difference in male literacy rate	-0.021
Standard Deviation	(0.016)
Average (whole sample)	0.693
Standard deviation (whole sample)	(0.008)
Difference in female literacy rate	-0.039
Standard Deviation	(0.024)
Average (whole sample)	0.545
Standard deviation (whole sample)	(0.012)
Difference in male turnout	0.004
Standard Deviation	(0.016)
Average (whole sample)	0.676
Standard deviation (whole sample)	(0.008)
Difference in female turnout	-0.013
Standard Deviation	(0.019)
Average (whole sample)	0.634
Standard deviation (whole sample)	(0.009)
Difference if the share of working females in total female population	0.033
Standard Deviation	(0.018)
Average (whole sample)	0.252
Standard deviation (whole sample)	(0.009)
Difference in the proportion of seats reserved for SC/ST	0.001
Standard Deviation	(0.032)
Average (whole sample)	0.224
Standard deviation (whole sample)	(0.016)
Difference in the proportion district population living in rural areas	0.029
Standard Deviation	(0.039)
Average (whole sample)	0.657
Standard deviation (whole sample)	(0.019)
Difference in the proportion of seats won by women in elections that were not close	-0.021
Standard Deviation	(0.013)
Average (whole sample)	0.051
Standard deviation (whole sample)	(0.006)
Number of female contestants per seat in the district	-0.068
Standard Deviation	(0.072)
Average (whole sample)	0.737
Standard deviation (whole sample)	(0.036)
Number of district elections	152

Figures in parenthesis report the standard error

Table 10: Mean comparison test of district and election years that had and did not have close elections

Unit of Observation: District in Election year Sample: District in election years (1998 – 2011)	
Difference in male literacy rate	0.019**
Standard Deviation	(0.009)
Average (whole sample)	0.677
Standard deviation (whole sample)	0.004
Difference in female literacy rate	0.03**
Standard Deviation	(0.013)
Average (whole sample)	0.518
Standard deviation (whole sample)	0.005
Difference in male turnout	0.001
Standard Deviation	(0.009)
Average (whole sample)	0.676
Standard deviation (whole sample)	0.004
Difference in female turnout	0.007
Standard Deviation	(0.011)
Average (whole sample)	0.628
Standard deviation (whole sample)	0.004
Difference if the share of working females in total female population	-0.029***
Standard Deviation	(0.01)
Average (whole sample)	0.277
Standard deviation (whole sample)	0.004
Difference if the share of working females in total female population (not working as casual/marginal laborers)	-0.006
Standard Deviation	(0.008)
Average (whole sample)	0.162
Standard deviation (whole sample)	0.003
Difference in the proportion of seats reserved for SC/ST	-0.041***
Standard Deviation	(0.015)
Average (whole sample)	0.276
Standard deviation (whole sample)	0.006
Difference in the proportion district population living in rural areas	-0.065***
Standard Deviation	(0.019)
Average (whole sample)	0.711
Standard deviation (whole sample)	0.008
Difference in number of female contestants per seat in the district	0.096**
Standard Deviation	(0.045)
Average (whole sample)	0.671
Standard deviation (whole sample)	0.018
Number of district elections	799

Figures in parenthesis report standard error, * significant at the 10%, **significant at the 5%, ***significant at the 1%.

Table 11: Regression of purchase decisions on female representation at state level

Unit of observation: Eligible women	(1)	(2)	(3)	(4)
Fraction of seats with female state legislators from the district	0.0438*	0.109**	0.6787***	0.523***
	(0.0238)	(0.0452)	(0.1138)	(0.1282)
Fraction of seats in the district which had close election between men and women (3.5 percent vote margin)				0.0987
				(0.0639)
Literacy rate of the district	0.2194***	-1.2526***	-1.0521***	-1.0816***
	(0.0554)	(0.1663)	(0.1697)	(0.1701)
Share of SC/ST population in the district	0.2954***	-1.0455***	-0.9461***	-0.9824***
	(0.0347)	(0.1933)	(0.1951)	(0.1961)
Share of population living in the rural areas of the district	-0.1221***	0.2208**	0.0747	0.1114
	(0.0218)	(0.0943)	(0.0965)	(0.0976)
Share of working female in total female population	0.0503	2.0122***	2.0854***	2.0935***
	(0.0516)	(0.107)	(0.1074)	(0.1074)
Respondent is the wife of the head of the household	0.0767***	0.02	0.0187	0.0188
	(0.005)	(0.0136)	(0.0136)	(0.0136)
Mother in Law lives in the same house	-0.0848***	-0.0475***	-0.0431***	-0.0442***
	(0.0053)	(0.0116)	(0.0117)	(0.0117)
Respondent has given birth to at least one son	0.0325***	0.0358*	0.0374**	0.0367**
	(0.0061)	(0.0183)	(0.0184)	(0.0183)
Number of years of marriage	0.0038***			
	(0.0003)			
Years of schooling of the respondent	0.0041***			
	(0.0006)			
If the respondent is working for wages	0.0432***	0.0261***	0.0308***	0.0297***
	(0.0051)	(0.0093)	(0.0094)	(0.0094)
If the respondent is living in urban area	0.0068			
	(0.0065)			
First Stage Regression				
Fraction of seats in the district where women won against men in close elections (3.5 percent margin)			0.6465***	0.8578***
			(0.016)	(0.026)
Fraction of seats in the district which had close election between men and women (3.5 percent vote margin)				-0.2073***
				(0.0204)
Regression Model	OLS	FE	FE-2SLS	FE-2SLS
Number of Observations	34445	32366	32194	32194

Figures in parenthesis report robust standard error, * significant at the 10%, **significant at the 5%, ***significant at the 1%.. Time dummy for the year of interview has been included in the model.

Table 12: Regression of fertility decisions on female representation at state level

Unit of observation: Eligible women	(1)	(2)	(3)	(4)
Fraction of seats with female state legislators from the district	0.0751***	0.0398	0.5861***	0.3784***
	(0.0178)	(0.0436)	(0.1108)	(0.122)
Fraction of seats in the district which had close election between men and women (3.5 percent vote margin)				0.0967*
				(0.0561)
Literacy rate of the district	0.1185***	-1.012***	-0.8226***	0.2081
	(0.0418)	(0.1545)	(0.1569)	(0.193)
Share of SC/ST population in the district	0.1493***	-0.1062	-0.0003	-0.0626
	(0.0245)	(0.19)	(0.1931)	(0.1892)
Share of population living in the rural areas of the district	-0.0184	0.0481	-0.0921	-0.5828***
	(0.0167)	(0.0883)	(0.0908)	(0.0963)
Share of working female in total female population	-0.1069***	1.0065***	1.073***	0.8513***
	(0.0383)	(0.092)	(0.0933)	(0.099)
Respondent is the wife of the head of the household	0.0014	-0.0125	-0.0138	-0.0186
	(0.0038)	(0.0118)	(0.0119)	(0.0116)
Mother in Law lives in the same house	-0.0146***	-0.0119	-0.0079	-0.005
	(0.0038)	(0.0101)	(0.0102)	(0.0099)
Respondent has given birth to at least one son	0.0105**	0.0349**	0.0368**	0.0325**
	(0.0044)	(0.0147)	(0.0149)	(0.0145)
Number of years of marriage	0.0006**			
	(0.0002)			
Years of schooling of the respondent	0.0018***			
	(0.0005)			
If the respondent is working for wages	0.0075**	-0.0033	0.0007	0.0099
	(0.0038)	(0.0086)	(0.0087)	(0.0085)
If the respondent is living in urban area	0.0107**			
	(0.0049)			
First Stage Regression				
Fraction of seats in the district where women won against men in close elections (3.5 percent margin)			0.6585***	0.825***
			(0.0193)	(0.033)
Fraction of seats in the district which had close election between men and women (3.5 percent vote margin)				-0.1858***
				(0.0257)
Regression Model	OLS	FE	FE-2SLS	FE-2SLS
Number of Observations	27012	23828	23396	23398

Figures in parenthesis report robust standard error, * significant at the 10%, **significant at the 5%, ***significant at the 1%.. Time dummy for the year of interview has been included in the model.

Table 13: Estimation of policy effect

Unit of observation: Eligible women	Purchase Decision	Fertility Decision
Fraction of seats with female state legislators from the district	0.365***	0.365***
	(0.133)	(0.12)
Fraction of seats which had close election between man and woman (3.5 % vote margin)	0.157**	0.099*
	(0.063)	(0.056)
Number of years after the election when the interview was held	0.091***	0.027
	(0.019)	(0.018)
Literacy rate of the district	-0.057	0.24
	(0.201)	(0.195)
Share of SC/ST population in the district	-0.787***	-0.089
	(0.194)	(0.189)
Share of population living in the rural areas of the district	-0.42***	-0.57***
	(0.104)	(0.096)
Share of working female in total female population	1.791***	0.874***
	(0.115)	(0.101)
Mother in Law lives in the same house	-0.038***	-0.018
	(0.011)	(0.012)
Respondent is the wife of the head of the household	0.015	-0.004
	(0.013)	(0.01)
Respondent has given birth to at least one son	0.029*	0.033**
	(0.018)	(0.014)
If the respondent is working for wages	0.038***	0.01
	(0.009)	(0.008)
First Stage Regression		
Fraction of seats in the district where women won against men in close elections (3.5 percent margin)	0.812***	0.841***
	(0.027)	(0.033)
Fraction of seats which had close election between man and woman (3.5 % vote margin)	-0.183***	-0.194***
	(0.021)	(0.025)
Regression Model	IV 2SLS- FE	IV 2SLS- FE
Number of Observations	32194	23396

Figures in parenthesis report robust standard error, * significant at the 10%, **significant at the 5%, ***significant at the 1. Time dummy for the year of election has been included in the model.

Table 14:Robustness checks for regression of purchase decisions using various vote margins

(3, 4 and 5 percent vote margin)

Unit of observation: Eligible women	(1)	(2)	(3)
Fraction of seats with female state legislators from the district	0.33**	0.469***	0.37***
	(0.134)	(0.114)	(0.103)
Fraction of seats which had close election between man and woman	0.062	0.009	-0.075
	(0.065)	(0.058)	(0.056)
Literacy rate of the district	-1.163***	-1.123***	-1.183***
	(0.17)	(0.168)	(0.167)
Share of SC/ST population in the district	-1.012***	-0.984***	-0.989***
	(0.196)	(0.196)	(0.195)
Share of population living in the rural areas of the district	0.159	0.128	0.162*
	(0.097)	(0.096)	(0.095)
Share of working female in total female population	2.052***	2.061***	2.03***
	(0.107)	(0.107)	(0.107)
Mother in Law lives in the same house	-0.046***	-0.045***	-0.046***
	(0.012)	(0.012)	(0.012)
Respondent is the wife of the head of the household	0.019	0.019	0.02
	(0.014)	(0.014)	(0.014)
Respondent has given birth to at least one son	0.036**	0.037**	0.037**
	(0.018)	(0.018)	(0.018)
If the respondent is working for wages	0.028***	0.029***	0.028***
	(0.009)	(0.009)	(0.009)
First Stage Regression			
Fraction of seats in the district where women won against men in close elections	0.854***	0.836***	0.845***
	(0.026)	(0.022)	(0.019)
Fraction of seats which had close election between man and woman	-0.235***	-0.182***	-0.181***
	(0.021)	(0.016)	(0.016)
Vote margin used	3 percent	4 percent	5 percent
Regression Model	IV 2SLS- FE	IV 2SLS- FE	IV 2SLS- FE
Number of Observations	32194	32194	32194

Figures in parenthesis report robust standard error, * significant at the 10%, **significant at the 5%, ***significant at the 1%.. Time dummy for the year of interview has been included in the model.

Table 15: Robustness checks for regression of fertility decisions using various vote margins

(3, 4 and 5 percent vote margin)

Unit of observation: Eligible women	(1)	(2)	(3)
Fraction of seats with female state legislators from the district	0.422***	0.417***	0.352***
	(0.123)	(0.107)	(0.096)
Fraction of seats which had close election between man and woman	0.018	0.057	0.072
	(0.057)	(0.052)	(0.05)
Literacy rate of the district	-0.876***	-0.863***	-0.884***
	(0.157)	(0.156)	(0.155)
Share of SC/ST population in the district	-0.034	-0.043	-0.057
	(0.193)	(0.193)	(0.193)
Share of population living in the rural areas of the district	-0.051	-0.053	-0.038
	(0.091)	(0.09)	(0.089)
Share of working female in total female population	1.056***	1.066***	1.058***
	(0.093)	(0.093)	(0.092)
Mother in Law lives in the same house	-0.009	-0.009	-0.01
	(0.01)	(0.01)	(0.01)
Respondent is the wife of the head of the household	-0.013	-0.014	-0.014
	(0.012)	(0.012)	(0.012)
Respondent has given birth to at least one son	0.036**	0.036**	0.036**
	(0.015)	(0.015)	(0.015)
If the respondent is working for wages	0	0	-0.001
	(0.009)	(0.009)	(0.009)
First Stage Regression			
Fraction of seats in the district where women won against men in close elections	0.884***	0.855***	0.863***
	(0.032)	(0.027)	(0.023)
Fraction of seats which had close election between man and woman	-0.243***	-0.184***	-0.187***
	(0.025)	(0.02)	(0.019)
Vote margin used	3 percent	4 percent	5 percent
Regression Model	IV 2SLS- FE	IV 2SLS- FE	IV 2SLS- FE
Number of Observations	23396	23396	23396

Figures in parenthesis report robust standard error, * significant at the 10%, **significant at the 5%, ***significant at the 1%.. Time dummy for the year of interview has been included in the model.

Table 16: Regression of involvement of women, living in rural areas, in decision of purchase of expensive durable on gender of the Village Pradhan

Unit of observation: Eligible women	(1)	(2)	(3)
If the Village Pradhan is female	0.025***		0.0357***
	(0.0058)		(0.0073)
If the seat of Village Pradhan is reserved for women		0.0301***	
		(0.0062)	
Percentage of population in the village that is not SC/ST/OBC	0.0004***	0.0004***	0.0005***
	(0.0001)	(0.0001)	(0.0001)
Percentage of SC/ST population in the village	-0.0001	-0.0001	-0.0001
	(0.0002)	(0.0002)	(0.0002)
Percentage of Hindu population in the village	-0.0008***	-0.0009***	-0.0009***
	(0.0003)	(0.0003)	(0.0003)
Percentage of Muslim population in the village	-0.0008**	-0.0008***	-0.0008***
	(0.0003)	(0.0003)	(0.0003)
District FE	Yes	Yes	Yes
First Stage Regression			
If the seat of Village Pradhan is reserved for women			0.8431***
			(0.0036)
Regression Model	OLS	OLS	2SLS
Number of Observations	23722	23665	23644

Figures in parenthesis report robust standard error, * significant at the 10%, **significant at the 5%, ***significant at the 1%. Other controls included in the model are indicator for respondent's mother in law living in the same house, indicator if the respondent's spouse is head of the household, if the respondent has given birth to at least one son, years of schooling of the respondent, years since the respondent has been married, wealth quantile, dummy for main source of income of the household, dummy for caste-religion group to which the household belongs and district fixed effects. Estimation sample is limited to women who report their age to be less than 45 in both rounds.

Table 17: Regression of involvement of women, living in rural area, in decision of fertility on gender of the Village Pradhan

Unit of observation: Eligible women	(1)	(2)	(3)
If the Village Pradhan is female	0.0167***		0.0154***
	(0.0042)		(0.0052)
If the seat of Village Pradhan is reserved for women		0.013***	
		(0.0044)	
Percentage of population in the village that is not SC/ST/OBC	-0.0001	-0.0002	-0.0001
	(0.0001)	(0.0001)	(0.0001)
Percentage of SC/ST population in the village	0.0001	0	0.0001
	(0.0001)	(0.0001)	(0.0001)
Percentage of Hindu population in the village	-0.0004**	-0.0004**	-0.0004**
	(0.0002)	(0.0002)	(0.0002)
Percentage of Muslim population in the village	-0.0001	-0.0001	-0.0001
	(0.0002)	(0.0002)	(0.0002)
District FE	Yes	Yes	Yes
First Stage Regression			
If the seat of Village Pradhan is reserved for women			0.8441***
			(0.0041)
Regression Model	OLS	OLS	2SLS
Number of Observations	18933	18884	18871

Figures in parenthesis report robust standard error, * significant at the 10%, **significant at the 5%, ***significant at the 1%. Other controls included in the model are indicator for respondent's mother in law living in the same house, indicator if the respondent's spouse is head of the household, if the respondent has given birth to at least one son, years of schooling of the respondent, years since the respondent has been married, wealth quantile, dummy for main source of income of the household, dummy for caste-religion group to which the household belongs and district fixed effects. Estimation sample is limited to women who report their age to be less than 45 in both rounds.

Table 18: Regression of involvement of women in decision of purchase of expensive durable on fraction of female state politicians from rural areas of the district

Unit of observation: eligible women	(1)	(2)	(3)
Fraction of seats with female state legislators from the district	0.0558**	0.3638***	0.4077***
	(0.0276)	(0.0569)	(0.0829)
Literacy rate of the district	0.3977***	0.3998***	0.6837***
	(0.0663)	(0.0661)	(0.1242)
Share of SC/ST population in the district	0.2967***	0.2912***	0.3832***
	(0.0408)	(0.0406)	(0.0756)
Share of population living in the rural areas of the district	-0.1503***	-0.1346***	-0.0034
	(0.0323)	(0.0325)	(0.0627)
Percentage of population in the village that is not SC/ST/OBC	0.0002	0.0001	0.0002
	(0.0001)	(0.0001)	(0.0003)
Percentage of SC/ST population in the village	-0.0001	-0.0001	0.0003
	(0.0001)	(0.0001)	(0.0003)
Percentage of Hindu population in the village	-0.0006**	-0.0005**	0.0015**
	(0.0002)	(0.0002)	(0.0006)
Percentage of Muslim population in the village	-0.0004	-0.0003	0.0015**
	(0.0003)	(0.0003)	(0.0007)
First Stage Regression			
Fraction of seats in the district where women won against men in close elections (3.5 percent margin)		1.0009***	1.0553***
		(0.0136)	(0.0287)
Regression Model	OLS	2SLS	2SLS
Number of Observations	23867	23867	6799

Figures in parenthesis report the robust standard error, * significant at the 10%, **significant at the 5%, ***significant at the 1%.. Other controls included in the model are indicator for respondent's mother in law living in the same house, indicator if the respondent's spouse is head of the household, if the respondent has given birth to at least one son, years of schooling of the respondent, years since the respondent has been married, wealth quantile, dummy for main source of income of the household, dummy for caste- religion group to which the household belongs and region dummy as including district dummy leads to drop of observations.

Table 19: Regression of involvement of women in decision of fertility on fraction of female state politicians from rural areas of the district

Unit of observation: eligible women	(1)	(2)	(3)
Fraction of seats with female state legislators from the district	0.0943***	0.2086***	0.1815***
	(0.0201)	(0.0442)	(0.0549)
Literacy rate of the district	0.1894***	0.1885***	0.2942***
	(0.0493)	(0.0492)	(0.092)
Share of SC/ST population in the district	0.0592**	0.0568**	0.0838
	(0.0269)	(0.0269)	(0.0509)
Share of population living in the rural areas of the district	-0.1153***	-0.1098***	-0.0738**
	(0.0221)	(0.0221)	(0.037)
Percentage of population in the village that is not SC/ST/OBC	0	0	0.0004**
	(0.0001)	(0.0001)	(0.0002)
Percentage of SC/ST population in the village	0.0003***	0.0003***	0.0006***
	(0.0001)	(0.0001)	(0.0002)
Percentage of Hindu population in the village	-0.0002	-0.0002	0.0013**
	(0.0002)	(0.0002)	(0.0005)
Percentage of Muslim population in the village	0.0001	0.0001	0.0017***
	(0.0002)	(0.0002)	(0.0006)
First Stage Regression			
Fraction of seats in the district where women won against men in close elections (3.5 percent margin)		0.9832***	1.036***
		(0.0151)	(0.0312)
Regression Model	OLS	2SLS	2SLS
Number of Observations	19035	19035	5398

Figures in parenthesis report the robust standard error, * significant at the 10%, **significant at the 5%, ***significant at the 1%.. Other controls included in the model are indicator for respondent's mother in law living in the same house, indicator if the respondent's spouse is head of the household, if the respondent has given birth to at least one son, years of schooling of the respondent, years since the respondent has been married, wealth quantile, dummy for main source of income of the household, dummy for caste- religion group to which the household belongs and region dummy as including district dummy leads to drop of observations.

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