UNIVERSITY OF GOTHENBURG
SCHOOL OF BUSINESS, ECONOMICS AND LAW

Political reservations and women's economic activity in India

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Linn Alexandersson

Abstract

Gender equality is important for economic development. In this paper, I will investigate the relationship between women's political reservation in local governance in India and women's economic activity within the labour market. I will also examine how a change in the proportion of reserved women from 33% to 50% impact women's economic activity. I take advantage of the randomization that is implemented in the reform and use a Difference-in-Difference method to evaluate these questions. The results are mixed, when estimating the impact of a female chairperson, I find no significant results. Upon studying the number of times, a district had a female chairperson I find a fairly robust and significant positive effect from the reform on women's economic activity. However, I find no evidence that an increase in the quota from 33% to 50% on political reservation impacted women's labour force participation.

Contents

1. Introduction

Women still suffer significantly from gender inequality, especially in developing countries. This can be seen through, for instance, lower attendance for girls in secondary school, lower female labour force participation rate (LFPR) and also through unequal inheritance rights for women (Duflo, 2012). The previous study found that women, especially those in developing countries have been prevented from having a job outside their home (e.g., Oya, 2010; Oya and Sender, 2009; Sender, 2003). Women's low LFPR is not only an economic problem but also a severe empowerment problem with substantial social cost and profound effects on women´s health and living standard (Marmot et al. 1991). Furthermore, women's low LFPR is a barrier towards development because of the small share of the population that participates in the labour market (Thévenon et al., 2012). This is particularly pertinent in India, according to Lahoti and Swaminathan (2016) the female LFPR in India has declined from 34 % in 1983-84 to 28 % in 2011-12 over the years. Identifying the factors that improve women's economic activity is, therefore of importance in order to construct policies to increase women's economic activity.

In this paper, I investigate whether female political attendance is a determinant of women's economic activity in India. Over 100 countries, both high- and low-income, have adopted political reservation for women that operationalize women's political participation from national to the local level (Beaman et al., 2012). In this thesis, I will use the gender quota reform[1] that was implemented during the mid-1990, to enforce and enable women to take up political positions and be more involved in a country's decision-making. This reform has the benefit that it was randomly assigned across districts. If the reform has a positive effect on women's economic activity, then genders quota could be a helpful tool to enable women to participate in the labour market.

Several studies have investigated the effect of political reservations for women in India. Chattopadhyay and Duflo (2004) was one of the first papers to investigate this gender quota policy, they found that the quota increases investments of public goods demanded by women. Beaman et al. (2012) and Clots-Figueras (2012) found that gender quota leads to an improvement in girl's attendance at school. Ghani at al. (2012) and Ghani et al. (2013) suggests that women's attendance in political decisions is an essential socio-economic variable correlated positively to women's participation in the labour market. Despite this literature, there is still a gap in the literature investigating the relationship between political reservation and women's economic

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[1] More about this reform in section 3.

activity. Further, the existing results do not account for the number of times a woman has been reserved for the position of the head over time. For instance, the effect of having a woman reserved for the seat two times compared to one time might result in different outcomes and are therefore, an important aspect to consider. A few studies have found that female political representation affects women's overall labour force participation (Ghani at al., 2012; Ghani et al., 2013). But these studies ignore informal, unpaid work that is common in places like India Garikipati (2008) and the number of times women have been reserved for the position of the head. Earlier research has also not investigated how a change in the proportion of reserved women from 33 % to 50% impacts female labour force participation. This, despite research by Schwindt-Bayer (2009) showing that the efficiency of gender quotas depends on both the design and size for the reform to have a significant effect on society. This paper will try to fill all these gaps.

The first question of this thesis asks whether *political reservation for women has changed women's economic activity?* To study the causal effect of political gender reservation on women's economic activity, a difference-in-difference (DD) model is used. To evaluate this question, I compare the districts that obtain a randomized seat reserved for women during a current election period (treatment group) with the district that elects a man[2] (control group), as used by (Iyer et at., 2012). Thanks to the randomization in the policy reform, I can solve the endogeneity issues caused by omitted variable bias[3] and other causality problems[4].

The second research question examines *how districts are affected by having a female leader during several different election periods?* In other words, I compare the districts that have had women reserved for the position of the head once, and the districts that had women reserved twice or more[5] with the districts that never have had women reserved. This means that I compare the effect of having a female leader during one or two election periods compared to never have a female leader. Moreover, I can also control for the possibility that the effect of a female leader takes time to have a significant impact on women's LFPR and then the effect might be implemented in the

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[2] Since I only have the information about the gender of the chairperson and not if the elected person is reserved for the seat. There is a possibility that a woman does not obtain a reserved seat and instead have been elected despite the seat were unreserved. Chattopadhyay and Duflo (2004) suggest that it is very uncommon that a woman is elected to the position of the head if the seat is unreserved and because of this I will treat all female heads as they have been elected to the seat because of the political reservation reform.

[3] Can occur when other variables that not are controlled for affecting the outcome variable. For instance, access to daycare for children in a district would probably affect the share of women that works.

[4]. Causality problems can occur, for instance, if the share of women that work is higher in some district, the possibility that there also are more women that are dedicated to the society and want to contribute by being the leader might be higher in the district where the share of women that works are already high and this can create causality problems.

[5] Since the districts that had women reserved more than twice are very few, I include those with the districts that had a woman reserved twice.

next election period when it's a high probability that it is a male leader again. I will also evaluate if there is any difference between having women reserved for two consecutive elections compared to having women reserved for the seat two inconsecutive times. Hence, I can then evaluate the effect of having consecutive female leaders over time (ten years) compared to having women for the same number of election cycles but not in one range.

Lastly, the third question examines *how a change in the proportion of reserved women from 33 % to 50 % impacts women's economic activity?* To evaluate this effect, I use a method by Iyer et al. (2012) to estimate the variation in the implementation of the expanded gender quota reform between different states in India. I use a dummy variable, which takes the value one in years following the first local government election that implemented the 50 % reservation scheme for women. This way, I can measure the effectiveness of the change in gender quota from 33% to 50% on women's economic activity.

To examine these questions, I used panel data collected by the National Sample Survey Office (NSSO) from a part of the government of India (GOI). I connect this with a data set constructed by Iyer et al. (2012) on the local government reservation of women in the districts. Finally, I extend this dataset with data I have scraped from the State Election Commission[6]. I estimate four different dependent variables on women's economic activity, the labour force participation rate (LFPR), paid work, unpaid work and domestic duties.

The result for the first research question shows a statistically insignificant impact of having a female leader on women's economic activity. Nevertheless, the second research question shows a positive and statistically significant effect on women's economic activity in the district that had a female leader once or twice compared to the districts that never have had a female leader. The districts that had been reserved twice had the most considerable effect on women's economic activity; this result implies that women's political reservation has a positive effect on women's economic activity, but it takes time to eventuate. Moreover, the study tries to examine if the result is robust due to the randomization in the quota policy by including control variables and fixed effects, the results are fairly robust to the changes in model specification. However, the results are not robust according to the robustness checks[7]. Further, the third research question shows no evidence that the change in the proportion of reserved women from 33 % to 50 % had an impact on women's labour force participation.

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[6] Obtained from State Election Commissions for each state.
[7] See section 8

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The remainder of this study proceeds as follows. In the next section 2, I will review the existing literature that is closest to my paper. Then I summarize the gender quota reform of political reservation for women at the local government level in section 3. Section 4 reviews the underlying theory. Section 5 describes the data, the variables of interest, summary statistics, section 6 describes the empirical strategy. Section 7 contains the result and discussion, and section 8 describes the robustness checks. Finally, section 9 conclusion.

2. Literature Review

Numerous researches have shed light on the potential gain from increasing women's political representation and the strength of women's opportunities in several countries. Franceschet and Piscopo (2008) estimate the effect of a gender quota introduced in Argentina in 1991 and find evidence that the gender quota contributed to an improvement in passing women's rights laws in the Argentine Congress. They also find a positive effect on the negative stereotypes about women's capacities as politicians. Krook (2013) investigated this topic in Africa and found that gender quotas lead to both developments of democracy and women's empowerment. Several studies have estimated the effect of the quota reform that was introduced in India in April 1993[8] within several different research fields. I will focus on the literature evaluating women's political reservation as these are the closest to my study.

Several studies estimate the relationship between women's political reservation in policymaking and find that increased female political representation is associated with significant change in policymaking (see, e.g., Chattopadhyay and Duflo, 2004; Duflo and Topalova, 2004; Clots-Figueras, 2011 Munshi and Rosenzweig, 2010). For instance, Chattopadhyay and Duflo (2004) use the political reservation for women in India to investigate the impact of women's leadership on policymaking. They use a dataset on the composition of village councils in two different regions, Rajasthan and West Bengal. In Rajasthan, the seats were reserved for women, and in West Bengal the seats were unreserved. They compared the distribution of public goods and find that investment requests by women increase in the region where seats are reserved for women. Hence, leaders often invest more in requests coming from their gender. Duflo and Topalova (2004) measure the quantity and quality of public goods and found that village's reserved for women had more public goods, and the quality of these goods was at least as high as in village's

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[8] More about this policy reform in section 3

that were unreserved for women. Furthermore, inhabitants in the village's reserved for women were also less likely to pay bribes.

Another study evaluating the effect of women's political reservation in India is Clots-Figueras (2012), and Beaman et al. (2012) these studies focus on education. Beaman et al. (2012) use the same political reservation reform for women in India to investigate the effect on both the attendance of girls in education and women's labour market outcome. They compared villages that were not reserved for women, with the village that was reserved once and those that were reserved twice. They find that the gap in education between adolescents were lowest in villages where the seats were reserved twice, second-lowest in the village's reserved once and highest in the village where women are unreserved. These findings show evidence that the reform reduced gender inequality in primary education among girls and boys. Beaman et al. (2012) also investigate women's labour market outcomes without finding any significant results. Clots-Figueras (2012) finds that primary educational attainment is higher in urban areas of the districts that have a female political reserved seat.

Iyer et al. (2012) consider the effect of women's political representations on crimes reported by women. They use the variation in the implementation of the gender quota reform between different states in India. They also used a method evaluating district chairperson post reserved for women to estimate the change in reported crimes by women. They find significant evidence that female political empowerment resulted in higher reporting of and arrests for crimes against women.

Directly in line with the specific topic of this paper are the two papers Ghain et al. (2012) and Ghain et al. (2013); they use the political reservation reform for women to evaluate employment among women in India. They use the same method as Iyer et al. (2012); estimating differences among district chairpersons post reserved for females to analyze women's employment. However, Ghain et al. (2012) investigate the effect of female political reservation on women in the manufacturing sector from 1994 to 2005 and finds no evidence of an increase in women's overall labour market participation. However, they found significant evidence that more women-owned businesses were built in the informal sector. Ghain et al. (2013) found an increase in the overall labour market participation in the public sector. Ghain et al. (2013) only use the method evaluating the chairperson post reserved for women to estimate the effect of the gender quota. This method does not account for the fact that the gender quota might take some time to have an impact on the labour market. It is only estimating the years of the election period when it is a woman at the seat and not the years after the election period. The years after the election period

with a female leader might still affect the labour market, which might affect the overall findings. Since Afridi et al. (2013) suggests that the result from female reservation might take time to have an impact and consequently, only estimating the election period with a female leader and not accounting for the years after the election period can lead to uncertain estimation. Therefore, I also following Afridi et al. (2013), I compare the districts that had women reserved for the seat over many election periods, by comparing the districts that had a woman reserved once or twice compared to the district that never had a woman reserved. Hence, I account for the effect of having a female leader during the years after the election period and not only under the election period, which controls for the fact that the effect of having a woman reserved might take time to have an impact.

This paper further deviates from the earlier literature in several ways. First, I estimate the effect of female leaders at the district level by considering the number of times women are the leader in the district, similar to Beaman et al. (2012) except that I estimate a longer time period at the district level (instead of village level) and can, therefore, include a larger part of India. This is particularly important, as Afridi et al. (2013) suggests that the result from female reservation might be different by region and also can take time to have an impact. Second, I not only investigate the overall change in women's LFPR, I also investigate the changes in women's formal paid and unpaid work outside their home due to the policy reform since unpaid work is common in countries like India. This is an important determinant when evaluating women's labour market opportunities since an increase in women's paid work has a positive effect on women's empowerment (Garikipati, 2008). Understanding the impact of gender quotas on both formal and informal female employment has never been previously studied. Third, I also investigate the change in the proportion of reserved women from 33 % to 50 % on women's economic activity. Schwindt-Bayer (2009) show that the efficiency of gender quotas depends on both the design and size of the reform to have a significant effect on society. Therefore, it is essential to investigate the expansion of gender quota from 33% to 50 % to identify if a larger quota size has a larger effect on women's labour force opportunities.

3. The panchayat system

In April 1993, a new reform was introduced, the 73rd Amendment to the Indian constitution. The reform required each state to create a three-tier system of local government, which was named the Panchayati Raj. In the structure of the Panchayati System, a group of around 5-15 villages that includes around 10,000 people, is organized into a Gram Panchayat (GP), this is the

lowest level in the hierarchy. This local government is responsible for the administration in twenty-nine areas, including administration over services like health and education, and also for other local services like roads and sanitation.

The block-level (Panchayat Samiti), and district level (Zilla Parisad) is the next highest in the hierarchy, they contain members elected by the people every five years, and the Act to conduct this election was provided by the State Election Commission. In the district level councils, the voters elect a council, and then the council elect a chairperson (chief) and a vice-chairperson (vice-chief). Political parties generally selected the candidates that are residents of the communities they represent. The council makes decision making by majority vote, and the chairperson has the last word. The gender reservation of the chairperson was supposed to function by rotation among the districts. This means that in any given cycle one-third of the districts in every state was randomly selected and had to require a female leader (chairperson) during the election period. In the next election cycle, the reservation rotated to the next set of districts who were randomly selected to have a female leader. A similar process occurred for the reservation for the two castes, Scheduled and Tribes.

The Panchayati system has existed in India since the 1950' in most of the major states[9]. However, it has not always been active in all states, according to Ghatak and Ghatak (2002), before 1990, there were no elections held, and the Panchayat system did not assume to have an active role. In 1993, they introduced the three-tiered Panchayat system with the 73rd Amendment that was responsible for achieving elections while also reserving some positions for women. The proportion of women in the Panchayat councils raised to 36% after the 1993 election. In 2006 the proportion of reserved women was increased from 33% to 50 %; this was implemented in 20 out of 29 states which have now raised their gender quota to 50 % (Government of India, 2012).

4. Theoretical framework and hypothesis

4.1 Theory

An evolving body of economic theories has tried to explain how gender quotas affect women's economic activity, however, there is no existing coherent theoretical framework. Theories regarding gender quotas and women's economic activity could, similar to the empirical evidence, be categorized according to: (i) theories predicting a positive correlation between gender quota and social norms, that might increase the labour opportunities for women. (ii) Theories

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[9] Small states in India were only required to create a two-tier system of local government

predicting a positive correlation between females as role models on women's labour force opportunities.

4.2 The effect of gender quotas on social norms

Social norms exist in all societies and refer to how society believes an individual should behave (Michaeli and Spiro, 2017). Girls and boys grow up with different stereotypes that tell them how they should behave and their expected roles in society. The conventional stereotypes in society create a social comparison which performs a significant role in the society concerning the creation of gender differences. The comparison shapes certain gender roles, resulting in men and women, defining themselves using stereotypes connected to their own gender (Guimond et al., 2007). Yanni (1990) argues that men and women hold different stereotypes of roles based on their genders. Men are the ones with all the power and can act and make decisions, whereas women are liable to men and their power and decision-making. Women are then not acting from their own will; they instead act the way they are expected to act according to social norms.

Many women around the world report that they feel powerless to make their own decisions and have, therefore, been prevented from having a job outside their home. Oya (2010) established that in both Mozambique and Tanzania, women's father and husband had prevented them from having paid work where they were likely to connect with other men. Of the women who currently do not enter the labour force over 92 % of these women answer that they would rather have a paid work outside the home according to Das (2006), and of these, 65 % say that there is no other household member who likes to take these duties. Das (2006) also establishes that around one-third of these women wish to be employed, 25 % wished for a full-time job, and approximately 70 % wanted a part-time job. The women that wanted a full-time job also tend to have post-primary education but feel a compulsion to stay home because of the expected behaviour caused by social norms.

Hiller (2014) argues that gender inequality caused by certain social norms creates an education and labour gap with an underrepresentation of women, which limits economic development. These gaps are created by factors such as the existent gender difference in education due to parents' social norms, Bose (2012) argues that parents often are less willing to pay for their children's education if it does not provide an economic return in the future. Moreover, a woman has a higher probability of marrying a well-educated man than the likelihood that a man will marry a well-educated woman. Hence, parents are more willing to spending money on their son's education than on their daughters. Earlier research shows that gender bias occurs due to the difference in the amount the parents are willing to spend on their daughter's respectively son's

education (Azam and Kingdon, 2013). An increase in women's economic activity might change, the social norm regarding stereotypes and lead parents to be more willing to pay for their daughters' education.

Earlier research has established that gender quotas can change cultural attitudes on what seems to be acceptable characters for women. The concepts are that the exposure to characters that are not in line with the stereotype individuals created from social norms could reduce natural preconceptions (Dasgupta and Asgari, 2004). De Paola et al. (2010) investigating a gender quota in Italy that was implemented only during the years 1993-1995 and established that in villages that were exposed to the gender quota during this short time period were more likely to elect a woman in the next election period. This finding suggests that gender quotas can be a helpful tool to break down negative stereotypes.

Based on earlier research, I believe that increasing women's political power by using gender quota will have a positive effect on women's economic activity, by changing social norms and gender stereotypes. The general intuition behind the relationship between social norms and gender quota is that when women become more involved in powerful positions, they change the social norms, about what is considered acceptable behaviour (e.g., Dasgupta and Asgari, 2004; De Paola et al., 2010; Duflo, 2005). Hence, gender quotas influence social norms regarding men's and women's empowerment by normalization women in powerful positions. Further, changing the considered acceptable behaviour among women and men and makes women more authorized to make their own decisions. Hence, the social norms in society are changing due to the gender quota.

4.3 The effect of a female role model

Female role model works as an inspiration for women and can, therefore, enforce women to achieve positions, they did not think they were possible to achieve due to stereotype norms. For instance, if it becomes more common to see women in powerful political positions, more women believe that it is possible for them to succeed and also achieve a higher position in society. Spencer et al. (1999) used different psychological experiments to obtain information about performance and motivation, they find that women performed worse than men on a math test when they were told that the test is especially difficult for women. This result proved that women perform worse when they believe that they will perform worse. Therefore, a female role model might result in more women believe in themselves and think that they will succeed if they have other women as inspiration. Beaman et al. (2010) uses the political reservation for women in India and finds that the likelihood that a women's voices is heard at a meeting increased by 25%

when the local political leader position is reserved for women. This increased likelihood for women to speak in the meetings may be a result directly from the gender quota reform requiring the presence of women leader at the meeting, or indirectly from changes in the social norms about women's act in political positions. Regardless, the quota reservation policy is responsible for the increase in female citizen participation. These results suggest that women's participation in political positions increase their intensives to lead and contribute in policy making.

To sum up, earlier research shows evidence that both social norms and having a female role model lead to an increase in female empowerment and in turn can empower women to decide over their own lives and participate more in some economic activity. I expect gender quotas to affect the social norms positively by including more women in political positions. This makes women more committed to society, which increases the incentives to participate in economic activities and also by a female role model that enforce women to believe that they will succeed in the labour market.

4.4 Hypothesis

Based on the above discussion, three hypotheses will be tested. The hypothesis is that the relationship between the introduction of the 1993 political gender quota reform has a significant, positive effect on women's economic activity in India. I will evaluate this by three different hypotheses:

Hypothesis 1: Districts with a female leader during a given election period will have a change in social norms and female role model that lead to higher female economic activity.

Hypothesis 2: Districts that have had a female leader one or two times will have a change in social norms and female role model that lead to higher female economic activity compared to the district that never had a female leader. Also having a female leader for two consecutive elections leads to higher female economic activity than the district that had a female leader during two inconsecutive times.

Hypothesis 3: The change in the proportion of reserved women to 50% will have a larger impact on the change in social norms and female role model that lead to an increase in women's economic activity than the primordial gender quota of 33%. Since Schwindt-Bayer (2009) has estimated the efficiency of the gender quota and established that size is one essential aspect of the

reform to have an impact on society. Therefore, an increase in the size of the quota might have an increased effect on women's economic activity.

I believe that the effect of the gender quota may be a result of a change in the social norms and female role model.

5. Data

For the empirical analysis, I use a database collected from the National Sample Survey Office (NSSO). The survey contains data of the unorganized manufacturing sector, it is carried out from the Government of India (GOI). The survey used interviews to collect data from randomly selected households, during the years: 1987-8, 1993-4, 1999-2000, 2003-4, 2005-6, 2007-8, 2009-10, and 2011-12. The NSSO survey contains data on the question regarding employment at the individual level. Since there is a decline in women's employment due to increasing trends in education among younger cohorts, the sample is restricted to the 25-59 age group to isolate these trends (Lahoti and Swaminathan, 2016). I am then left with a sample of 346,372 individuals, which corresponds to a mean of 779 individuals in every district for every year. Since the survey is at an individual level, and I am interested in the proportion of women participating in the labour force, I will divide the sum of all women for every variable and divide it with all the women living in respective districts. In other words, I will construct variables that are in per capita for every district instead of individual variables.

5.1 Participation in economic activity variables

This study will estimate women's economic activity by using the *LFPR* for women between the age of 25-59 years as the dependent variable. All analyses in this study are based on NSSO´s question about the usual principal activity[10] and subsidiary activity[11] status. The usual participation activity remains a question about an individual's economic activity with several different possible responses regarding their main economic activity, in other words, what they do for a living. Depending on the different response from the interviews[12], NSSO categorizes the respondents into different categories[13], working (or employed), not working but seeking/available for work (unemployed) and neither working nor available for work (or not in the labour force).

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[10] and Usual activity status. Which is determined based on the main economic activity the respondent spends the majority of her time during a reference period of 365 days (NSSO 2011).

[11] Subsidiary status is based on the economic activity pursued for a shorter time or a minor period, which is not less than thirty days through the reference period of one year. This is a yes or no question (NSSO 2011).

[12], See Table 1 in the appendix for information about the answering alternatives.

[13]. See Table 1 in the appendix for more exactly detonates about the answering alternatives.

NSSO defines the two categories working and not working but seeking/available for work as inhabitants that participate in the labour force. I will use the same definition as NSSO and include the individuals that are categorized as unemployed to the group that participates in the labour force. Since I am interested in changes in social norms and if more women are seeking/available on the labour market; this might be because the social norms regarding women's expected duties to stay home and not be available on the labour market have changed. This is also the same as (Lahoti and Swaminathan, 2016). Nevertheless, they also separate women's LFPR into *paid work*[14] and *unpaid work*[15] to explore the pattern in women economic activity in India.

Since I am interested in women's empowerment and studies like Garikipati (2008) measure Indian women's empowerment in terms of income and assets and find a significant determinant. Also, women that participate in different microcredit programs have a significant and positive impact on women's empowerment (Garikipati, 2012). Several empirical studies suggest a significant and positive association between women paid work and dimensions of empowerment. Jose (2007) suggests that women that participate in the labour force tend to have more decision making and spatial mobility than women that do not participate in the labour force. Further, women that receive paid work tend to have an even higher saying about decision making and freedom of mobility. Whether women get paid for their work, has a crucial impact on their empowerment. Therefore, I separate paid and unpaid work as two dependent variables.

I also create a variable for the women that do not participate in the labour force and *only attend domestic duties*. The variable is created by including all women that respond with "attending domestic duties only" or "attending domestic duties only but also engaged in free collection of goods".

I have chosen these specific four outcome variables women's:

- *LFPR,*
- *Paid work,*
- *Unpaid work*
- *Domestic duties*

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[14], reference work paid in either any cash or kind; is the economic activity including self-employment, wage employment and causal labour (NSSO 2011).

[15] refers to the work that not receives in regular remuneration in cash or kind, which is the economic activity, including assistance in the operation of a family farm or enterprise (NSSO 2011).

Since I believe they are crucial for women's empowerment. If women are less responsible for domestic duties and more involved in the labour market, it enables a higher proportion of people to work and contribute to society. It can also benefit the whole society through lower fertility levels since women that participate in labour are estimated to have fewer children. Hence, it will benefit both women and the entire society.

5.2 Independent Variables – Reservation Status

The independent variable is reservation status of the *chairperson*; the variable describes whether or not the *chairperson* of the 129 districts in six different states is a woman in the following years 1987, 1993, 2000, 2004, 2006, 2008, 2010, and 2012. The data used for this variable is taken from Iyer's et al. (2012) data set on chairperson in 10 states for the years 1987 to 2007. I also complement this data with data I have collected from the State Election commission[16]. Due to the constraints of the availability of data on the State Election website for all the states in India, I was only able to obtain complemented data for women's reservation status in six states; therefore, I only include these six states[17] in this study. However, this is still far better than most studies which focus on one or two states. As suggested by Afridi et al. (2013) result from female reservation policy might be different by region, and therefore it is essential to examine the impact for a larger part of India with different regions.

The independent variable will capture the effect of a female leader that is randomly reserved in a district. Since the districts have changed from 1987 to 2012, I use the division of the district from 1987; this means that I merge the districts that are divided into different districts after 1987. For instance, the district Cuttack in the state Orrisa was one district in 1987 but is now divided into four different districts. Therefore, I merge these four different districts[18] into one district, Cuttack as it was in 1987. For the data set from NSSO for the year 2012 I had 178 districts and to get this dataset to fit both with the data set from NSSO for the remaining year and the dataset from Iyer et al. (2012) I merge this district into 129 to receive the same division of the districts like in 1987. Hence, 34 districts out of my 129 are merged with one to four other districts.

To estimate different methods on the reservation status, I will construct different reservation status variables. In the model that evaluates the first research question, I use the independent variable *chairperson*, which takes the value 1 if the seat is reserved for women and 0 otherwise

[16] Obtained from State Election Commissions for each state.
[17]. The included States are Andres Pradesh, Marathararara, Rajasthan, Orrisa, Haryana, and Bihar
[18]. The districts that are merged with Cuttack after 1987 are Kendrapara, Jagatsinghapur, and Jajapur

except for the districts that are merged. Merged districts will take a value between 0.25-1.5 for the districts that are reserved for women and 0 otherwise. For instance, if district Cuttack that is merged into one district with three other districts and one of these four districts is reserved for women, this district will take the value 0.25, and the same for all the other districts that are merged. This is the same method used by (Iyer et al., 2012).

The second model will evaluate the second research question. Here, I create a variable called *once* and *twice, once* is equal to 1 if the chairperson in the district is a woman during one election period[19], and 0 if the district never had a female chairperson. The variable *twice* is equal to 1 if the chairperson in the district is a woman during two elections[20] or more. This is similar to the method used by (Beaman et al., 2012). I will also evaluate the districts that had a female chairperson during two consecutive election periods. I, therefore, create a dummy variable *consecutive* that equals 1 if the district chairperson is reserved for women during two consecutive election periods. For instance, if a district had a woman reserved for the chairperson seat during the election period 2000-2004 and the next election 2005 the seat is reserved for women again. The variable then takes the value 1 and 0 if the district has been reserved for women in two inconsecutive time periods. Another example here is if the chairperson seat in the district is reserved for women in the election 2000-2004 and the next election 2005-2009 the chairperson is a male but the coming election 2010-2015 the seat is again reserved for women the variable will equal 0.

In the model for my third research question, I examine how a change in the proportion of reserved women from 33 % to 50 % impacts women's economic activity. Therefore, I create a dummy variable that takes the value one in years following the first local government election, which implemented the 50% reservation scheme for women.

5.3 Control variables

Several variables might affect both the independent variables of interest (political reservation) and the dependent variables (women's *LFPR, paid work, unpaid work* and *domestic duties)*, which could create a biased result if left uncontrolled. I, therefore, include controls for a range of factors that might affect the outcome variables in a given place and year.

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[19]. The merged Districts would be equal 1 if more than half of the districts had a woman reserved for the chairperson seat once.

[20]. Since there are very few districts that are reserved for a woman more than twice, I will not do a separate variable for those districts; I include them with the districts that are reserved twice.

Districts in India vary both in terms of the religion and ethnical background and therefore, the likelihood that women participate in the labour market might be affected by factors like religion, ethical and social norm on women's behaviour and duties. The degree of development of social institutions, e.g., in childcare, might affect women's participation in the labour market as well. The extent to which district a woman lives might determine women's labour market participation and are likely to differ by districts, and I therefore, control for district fixed effects.

The difficulty of estimating the labour market is that it varies over time. The number of inhabitants applying for a job varies due to economic changes and shocks and also to economic circumstance that might fluctuate over time. For instance, a bad year in agriculture might increase the demand for non-agricultural income; therefore, it is essential to control for these time-varying effects. Another essential control variable is the proportion of literate women, which most likely will affect the women that receive a job because if you are able to read you will likely be more coveted on the labour market. I also control for the proportion of women living in rural areas since Dasgupta and Goldar (2006) have found evidence that women in rural areas are less likely to work. Since the access to schooling and work opportunities due to geographic distance are limited in urban areas. I control for the proportion of Muslims since Rustagi (2013) has found that Muslim women are more likely not to be employed.

5.4 Descriptive Statistics

Table 1: Descriptive Statistics

VARIABLES	(1) Obs	(2) Mean Value	(3) Standard deviation	(4) Min Value	(5) Max Value
LFPR	1,028	0.482	0.210	0.00621	0.919
Paid Work	1,028	0.270	0.169	0	0.850
Unpaid Work	1,028	0.125	0.112	0	0.714
Domestic duties	1,028	0.579	0.221	0.102	0.983
Female/Male-ratio	1,028	0.993	0.105	0.649	1.923
Rural	1,028	0.690	0.185	0.0505	1
Literate	1,028	0.630	0.193	0.139	1
Muslim	1,028	0.0887	0.0725	0	0.522
Merrid	1,028	0.859	0.129	0.425	0.991
Chairpersion	1,031	0.268	0.418	0	1.500
Once	1,033	0.806	0.395	0	1
Twice	1,033	0.280	0.449	0	1
Number of Districts	129	129	129	129	129

In Table (1), summary statistics are presented. The dependent variable, LFPR has a mean of 48.2%, which indicates that approximately half of the women participate in any economic activity. The value ranges from 0.62% to 91.9% for the LFPR, which indicate that the share of women that participate in the labour force is extensive and varies a lot between the districts. In the district that has the lowest amount of women's LFPR, only 0.62 % work which corresponds almost only one women out of 200. In the district that has the highest amount of women's LFPR is 92 %, which represents approximately 9 out of 10 women. This massive variance between the district might be due to differences in religion, the control variable Muslim that estimates the share of inhabitants that are Muslims in a district varies from 0-0.522. Hence, some districts have no inhabitants with Islam as their religion and other districts, have around half of the population considered to be Muslim. Rustagi (2013) have established that Muslim women are more likely to not participate in the labour force and therefore one theory that might explain the changes in women's LFPR is the unequal distribution of Muslims among the districts. Also, paid and unpaid work varies expressively around the districts, the mean for paid- and unpaid work are 27 % and 12.5 % respectively. The Female/Male-ratio ranges from 0.649 to 1.923, which indicate that I might have an unequal sample of men and women in the dataset.

6. Methodology

To test the hypotheses and causal effect of women's political reservation on women's economic activity; this paper will apply three different empirical strategies taking advantage of the gender quota reform as a policy experiment.

In the ordinary least square (OLS) method, one of the assumptions is that the error term is uncorrelated with the dependent variable, the estimation is then endogenous. If this assumption does not fulfil, the OLS method will provide bias and inconsistent results (Stock and Watson, 2011). In this paper, randomization is used to control the problems regarding internal validity, such as reverse causality, omitted variables, and measurement errors. The assumption regarding randomization is; first, a relevant sample of the population is randomly collected, and then the control group and treatment group are randomly allocated from this sample. A well-designed program with a correctly randomized sample can be unbiased and provide a true estimation of the effect (Duflo et al., 2007). The political reservation for women which I observe in this study is a random policy experiment. The districts are randomly assigned to require women as chairperson. Thanks to the randomization in the reservation for women, this experimental

sample can then be randomly divided into two groups, a treatment group and a control group. The treatment group contains inhabitants living in a district where the chairperson is randomly reserved for women. The comparison or (control) group obtain the inhabitants living in a district where the chairperson is not reserved for women. The assumption of randomization is then fulfilled, and we might obtain a casual effect. The outcome variable is then observed for both treatments and without treatment (comparison groups). The average treatment effect is then estimated as the difference in empirical means of the outcome variable between the two groups,

$$\widehat{D} = \widehat{E}(Y_i|T) - \widehat{E}(Y_i|C),$$

Where $\widehat{E}$ denotes the sample average. As the sample size increases, this difference converges to:

$$D = E(Y_i^T|T) - \widehat{E}(Y_i^C|C).$$

Since the group of treatment inhabitants are randomly assigned, individuals assigned to the treatment and control groups differ in expectation only through their exposure to the treatment. If neither of the groups is exposed to the treatment, their outcomes would most likely be the same. Hence, the selection bias, $E(Y_i^T|T) - \widehat{E}(Y_i^C|C)$, is equal to zero (Duflo et al., 2007)

The regression to obtain $\widehat{D}$ is:

$$Y_i = \alpha + \beta T + u_{it}$$

Where T is the dummy for participating in the treatment group, the equation is estimated with ordinary least squares (OLS). Moreover, the $\widehat{\beta}_{OLS}$ estimates the average treatment effect.

6.1 Empirical model: Difference-in-Difference

I start the analysis by running an OLS estimation on the data for the six states and compare the means of the outcome variables of interest across district councils with different reservation status. I estimate a number of different equations with four different dependent variables.

6.2 Chairperson

To evaluate the first research question, I start by estimating the following regression on my four different dependent variables.

$$\ln(Y_{dt}) = \alpha_0 + \beta_1 Chairperson_{dt} + \beta_2 X'_{dt} + \delta_d + \theta_t + u_{dt} \tag{1}$$

Where (y) is my outcome variables; *LFPR, Paid work, unpaid work* and *domestic duties* per capita in the district (in logs). The key independent variable $Chairperson_{dt}$ is a dummy variable[21] equals one if the chairperson seat in district d in year t council is reserved for women, and zero otherwise. X'_{dt} is a vector of district-level control variables that accounts for district characteristics. δ_d district fixed effects and θ_t are time fixed effects, allowing to control for factors varying over districts but not over time. u_{it} is the error term. All standard errors are clustered at the district level, to account for possible correlated shocks in a district that might affect the outcome variables. This method is similar to the one used by Iyer et al. (2012) to estimate the effect on gender-related crimes depending on the same gender quota reform as studied in this paper.

The NSSO data survey from GOI has some gaps, and therefore, I do not have the data for all the years between 1987-2012, this highlights some limitations to the model. Due to these limitations, I cannot estimate how the outcome variables will change for every year in an election period[22] Moreover, I cannot choose which specific year in the election period I want to estimate. For instance, in some districts, the election period will obtain an outcome effect that might account for the first or second year of the election period only and not for the fourth or fifth year the women are reserved for the district head. In other words, I cannot choose which specific year in an election period I want to estimate. For instance, the last year for every election period would most likely be the year when the effect of a female chairperson has the largest significant effect on the outcome variables. However, the restriction in the data set limited me from choosing to estimate the last year for every election period in every district, I can only estimate the last year for some districts.

Furthermore, the restriction in the election period to only five years can also generate uncertain estimation because the effect of a female political reservation might have a long-term effect on women's economic activity. Hence, the effect might show a significant impact after five years when it might be a male on the chairperson seat again. Consequently, this leads to uncertain estimation because the effect of having a female chairperson might show a significant effect in the next election period when it is a male at the seat again. This leads to wrong estimation since the effect of a female chairperson might take more than five years before it shows an effect on social norms and estimated significant results. Moreover, I will do another estimation as well, explained below, where I compare the districts that reserved the chairperson for women *once* or

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[21] Except for the merged districts, for these, the variable takes the value from 0.25 to 2.0
[22] The election periods are every five years for all the States except Andres Pradesh; one election period extends from 2006-2014.

twice or more compared to the districts that never reserved the chairperson for women. This method accounts for the long-term effect of having a woman as chairperson.

6.3 Reservation status

To evaluate the second research question, I will use the following regression model to estimate if there exist any differences between having a female leader once or twice compared to zero times.

$$\ln(Y_{dt}) = \alpha_0 + \beta_1 Once_t + \beta_2 Twice_t + \beta_3 X'_t + \delta_d + \theta_t + u_{dt} \qquad (2)$$

$Once_t$ is equal to 1 if the seat for the chairperson in the district is reserved for women during one election period[23], and 0 if the district never had women reserved for the chairperson seat. $Twice_t$ is equal to 1 if the seat for the chairperson in the district have been reserved for women twice or more[24], and 0 if the district had women reserved for the chairperson seat or one or zero time. δ_d district fixed effects, θ_t are time fixed effects and X'_t are defined as before. I compare the means of outcomes of interest across district councils with different reservation status.

6.4 Reservation Status - Consecutive

I now create the same estimation as above except I am taking all the districts that reserved the chairperson for women in at least two election cycles as my sample group. This sample excludes all the districts that only had a female chairperson during one or zero election periods:

$$\ln(Y_{dt}) = \alpha_0 + \beta_1 Consecutive_t + \beta_2 X'_t + \delta_d + \theta_t + u_{dt} \qquad (3)$$

Where $Consecutive_t$ is equal to 1 in districts where the chairperson is reserved for women during two consecutive election periods and 0 if the district has been reserved in two inconsecutive election periods[25]. Then I divide the sample group into one treatment group and one control group. The treatment group obtain the districts with two consecutive election periods with a woman as the chairperson. The control group contain all the districts that contains a woman in two inconsecutive election periods. This estimation shows the treatment effect between having a woman in the chairperson seat for at least ten years at one time compared to having a woman as chairperson for at least ten years but not in ten years following.

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[23]. The districts that are merged equal 1 if more than half of the districts had a woman reserved for the chairperson during one election period.

[24] Since there are very few districts that are reserved for women more than twice, I will not make a separate variable for those districts, I will include them with the district that is reserved twice.

[25] for a briefer explanation about this variable, seen section 5.3

6.5 State-level regression

To evaluate the third research question, focusing on how a change in the proportion of reserved women from 33% to 50% impacts women's economic activity. To evaluate if the size of the gender quota has a significant impact on my outcome variables; *LFPR, Paid work, unpaid work* and *domestic duties* per capita in the district (in logs).

$$\ln(Y_{dt}) = \alpha_0 + \beta_1 local\ government\ election_{st} + \beta_2 X'_{st} + \delta_s + \theta_t + u_t \tag{4}$$

The dummy $\beta_1 local\ government\ election_{st}$ equals one in years following the first local government election, which implemented the 50 % reservation scheme for women in state's, and zero otherwise. X'_{st} is a vector of state-level control variables that accounts for state characteristics. δ_s are state fixed effects and θ_t are time fixed effect, allowing to control for factors varying over states but not overtime. u_{it} is the error term. All standard errors are clustered at the state level, to account for possible correlated shocks in a state that might affect the outcome variables.

7. Result and discussion

7.1 Empirical model

This section will explain and discuss all the analysis from my OLS estimation with and without controls and fixed effects.

7.2 Variation in Chairperson

Table (3) presents the results from the first research question and Panel (A) shows the estimated results of the different outcome variables without district-characteristic controls and with fixed effects for year and district. Panel (B) shows the estimated results with both district-characteristic control variables and fixed effects for year and district. Panel (C) obtains the estimated results without both control variables and fixed effects.

I start the discussion by estimating the OLS model, in panel (A) (without control variables and with fixed effects). In the OLS, I find no statistically significant effects of having a woman district *chairperson* on any of the variables *LFPR, paid work, unpaid work* and *domestic duties*. These results deviates from Ghain et al. (2013) that estimate the gender reform on different work categorise and find evidence that women's LFPR increases in some industries.

As mentioned in the methodology, gender quota reform is carried out randomly to different districts. Thanks to the randomisation, I can solve for issues that might create concerns to the validity of the DD method presented in Table (3). I have in panel (A) excluded different district control variables which might influence women's economic activity in different districts. I have controlled for female-male ratio, Islam, literate, marriage and living area. I think these control variables pick up most of the differences between the districts not connected to the gender quota reform.

In panel (B), the result when including the control variables are presented, and I can compare it to the same regression without the controls in panel (A). I can see that the result is changing, also when comparing the outcome in Panel (A) with Panel (C). The changes in the results might indicate an issue regarding validity.

To sum up, the results in Table (3) shows no evidence that having a female leader impact women's economic activity variables. The reason behind these results might be related to the theory regarding social norms, that it will be a change in social norms associated with the gender quota takes time to change social norms. An election period is in general five years and then it is a new election, and therefore this method might not be that effective in the short term. For instance: if a district has a female chairperson for one election period, it will be a woman at the seat for generally five years. The probability that it is a male at the seat after these five years is quite large. Since the effect of a female chairperson might take more than five years before it shows an effect on social norms and estimated significant results.

Therefore, in Table (4), I estimate results using other independent variables of interest, namely, two dummy variables, *once* and *twice*. This method makes it possible to compare the districts that had a female chairperson once or more compared to the districts that never had a female chairperson.

Table 3: DD regressions, using OLS, evaluation of the effect of a female chairperson.

VARIABLES	(1) LFPR	(2) Paid work	(3) Unpaid work	(4) Domestic duties
	Panel (A)			
Chairperson	0.0509	-0.0139	-0.0312	0.0130
	(0.0356)	(0.0417)	(0.0714)	(0.0229)
Controls	No	No	No	No
Fixed Effects	Yes	Yes	Yes	Yes
Observations	1,026	1,025	963	1,026
R-squared	0.002	0.000	0.000	0.000
	Panel (B)			
Chairperson	-0.00870	-0.159***	0.00159	0.0597***
	(0.0381)	(0.0405)	(0.0669)	(0.0195)
Controls	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes
Observations	1,026	1,025	963	1,026
R-squared	0.200	0.420	0.113	0.472
Number of Districts	129	129	129	129
	Panel (C)			
Chairperson	0.0201	-0.0276	-0.0394	0.0181
	(0.0532)	(0.0422)	(0.0675)	(0.0212)
Controls	No	No	No	No
Fixed Effects	No	No	No	No
Observations	1,026	1,025	963	1,026
R-squared	0.000			
Number of Districts		129	129	129

*Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1*
Controls include: female male ration, married, Muslim, literate and rural.
Fixed Effects include: year and district.

7.3 Reservation Status

In Table (4), I examine the second research question; the impact of having a female leader on women's economic activity by the DD strategy outlined in section 5.2. As explained, the two dummy variables of interest are included, *once* and *twice*. The dummy variable *once* takes the value 1 for every district that had a female chairperson once and 0 otherwise. The dummy variable *twice*

takes value 1 if the district had a female chairperson twice or more[26] and zero otherwise. Both the variables *once* and *twice* are compared to the base group (districts that never had a female chairperson).

In Table (4), panel (A) the variable *once* estimates an increase by 29.5 percentage points on women's LFPR and the variable *twice* shows an increase by 45.1 percentage points, these are statistically significant at the 1% level. Likewise, I find a positive and significant result of domestic duties. The share of women only attending domestic duties decreases by 10.1 percentage points in the district with a female chairperson *once* and by 8.9 percentage points in the district with a female chairperson *twice*, these are statistically significant at the 1 % respectively 5% level. These results show evidence that the gender quota reform has had a positive impact on women's LFPR, and the district that has been exposed to the reform more times has an even larger effect of the reform on women's LFPR, and a negative effect on the share of women only attending domestic duties.

The variable paid work in panel (A) is statistically significant with the variable *once* and *twice*. I find evidence that districts that have been exposed to the reform *once* had a positive effect on women's *paid work* by 21.4 percentage points, this is statistically significant at the 1% level. Districts that have been exposed to the reform *twice* had a positive effect on women's *paid work* by 19.9 percentage points, this is statistically significant at the 1% level. The variable *unpaid work* has a positive effect in the districts that explored the reform once by 21.5 percentage points and *twice* by 39.7 percentage points this is statistically significant at the 5% respectively 1% level. These results are in line with the hypotheses except for the variable *unpaid work* that I had hypothesis that it would be affected negatively of the reform.

This methodology also takes advantage of the randomisation in gender quota to solve issues that might create concerns to the validity of the DD method presented in Table (4). I have in panel (B) included year and district fixed effects and control variables that might influence the women's economic activity in different districts. Nevertheless, I have controlled for female-male ratio, Muslim, literate, married and rural areas, and hopefully, pick up differences between the districts not connected to the gender quota reform. Panel (A), shows the results when excluding the control variables and panel (C) shows the results without both control variables and fixed effects. I can then compare the results in panel (B) and (C) with the results from panel (A) without control variables and with fixed effects included. We can see that the results are quite similar,

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[26] Since the number of the district that had women reserved more than twice is very low, I chose to include those districts with the districts that are reserved for women twice.

with some small changes. For the *LFPR* variable estimated on variable *once*, both the sign and significance remain the same in panal (B) and panal (A) but decreases in magnitude to 20.5 percentage points in panel (B). In panel (C) it remains the same, in both sign and magnitude as in panel (A) 29.5 percentage points. Both the variable *paid work,* and *domestic duties* remain statistically significant with the same sign. However, some changes in magnitude, this result shows evidence that the result might be fairly robust.

The largest change concerns the variable *paid work*; the sign remains the same. However, it is statistically significant at the 10% level in panel (B) and at the 1 % level in both panel (A), and Panel (C). The magnitude decreased to 10.2 percentage points respectively 21.1 percentage points in panel (B) and (C) compared to 21.4 percentage points in panel (A). This result may be because some of the controls are linked to specific districts characteristics connected to the control variables. Like religion, married and literate and having a *paid work* in a district is most likely associated with religion, married and literate.

The result for the second independent variable of interest *twice* in Table (4), also estimates similar effects in all the three panels, with only some small changes in the magnitude. Hence, the results might not be affected by the issue with omitted variable bias due to the randomisation in the model controlled for the endogeneity, except for the variable *paid work*. The variable *paid work* shows a statistically significant result in Panel (A) and Panel (C). It then changed to a statistically insignificant result in Panel (B) when including control variables. This change might sign that the result is not estimating a causal effect. Likewise, the case above this might be because some of the controls are linked to specific districts characteristics connected to the control variable.

To sum up, by comparing the district that had a female chairperson reserved for the seat once, twice or never, I find that having a woman reserved twice had the largest positive effect on women's economic activity and once had the second largest effect. The different result in Table (3) and (4) can then be related to the fact that social norms take time to change and therefore the second method is a better measurement of social norms associated to the gender quota since it accounts for the years after the election period with a female chairman.

Table 4: DD regressions, using OLS, evaluation of the effect between having a female chairperson once or twice in a district compared to never had a female chairperson.

VARIABLES	(1) LFPR	(2) Paid work	(3) Unpaid work	(4) Domestic duties
Panel A				
Once	0.295***	0.214***	0.215**	-0.101***
	(0.0613)	(0.0636)	(0.0962)	(0.0337)
Twice	0.451***	0.199***	0.397***	-0.0890**
	(0.0605)	(0.0653)	(0.103)	(0.0361)
Controls	No	No	No	No
Fixed Effects	Yes	Yes	Yes	Yes
Observations	1,026	1,025	963	1,026
R-squared	0.179	0.246	0.044	0.204
Panel (B)				
Once	0.205***	0.102*	0.141	-0.0720**
	(0.0589)	(0.0600)	(0.0998)	(0.0347)
Twice	0.388***	0.0916	0.403***	-0.0917**
	(0.0569)	(0.0614)	(0.102)	(0.0366)
Controls	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes
Observations	1,026	1,025	963	1,026
R-squared	0.242	0.338	0.092	0.265
Panel (C)				
Once	0.295***	0.211***	0.217**	-0.103***
	(0.0659)	(0.0730)	(0.0970)	(0.0374)
Twice	0.450***	0.194**	0.406***	-0.0907**
	(0.0654)	(0.0759)	(0.104)	(0.0405)
Controls	No	No	No	No
Fixed Effects	No	No	No	No
Observations	1,028	1,027	964	1,028
R-squared	0.051	0.010	0.016	0.008

*Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1*
Controls include: female male ration, married, Muslim, literate and rural.
Fixed Effects include: year and district.

7.4 Reservation Status - Consecutive

Finally, in Table (5), I estimate the DD estimation with a small sample that only obtain the districts that had a woman reserved for the chairperson twice or more. I compare the districts

that had a woman reserved for two consecutive elections with the districts that had women reserved for the seat two inconsecutive times[27].

Table (5) show a statistically significant result for all the four outcome variables in all the three panels. However, the result shows some unexpected outcomes. The dependent variable *consecutive* shows a negative result on both *LFPR* and *paid work* and a positive result for *domestic duties*.

This result implies that in districts with a female chairperson in two consecutive elections; women's *LFPR* decreased by 20.9 percentage points and the share of the women that obtain paid work decrease by 30.6 percentage points. Also, the women that only obtain domestic duties increases by 19.2 percentage points. These results were unexpected and not in line with the hypothesis. Moreover, I hypothesised that this would show a significant positive effect on women's economic activity and a negative effect on the share of women that only attend domestic duties. However, I find no evidence that districts with a female chairperson during ten years in two consecutive election period has a positive effect on women's economic activity compering to having a woman for ten years but in two inconsecutive election periods. Nevertheless, the result showed the opposite, which implies that there is a larger change in social norms associated to gender quota reform when districts have a female chairperson during two inconsecutive election period compared to two consecutive election periods.

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[27] More information about this variable in section 5.2

Table 5: DD regressions, using OLS, evaluation the effect between having a female chairperson in two consecutive election period compared to have a female chairperson in two inconsecutive election period.

VARIABLES	(1) LFPR	(2) Paid work	(3) Unpaid work	(4) Domestic duties
Panel (A)				
Consecutive	-0.209***	-0.306***	-0.343***	0.192***
	(0.0529)	(0.0676)	(0.128)	(0.0430)
Controls	No	No	No	No
Fixed Effects	Yes	Yes	Yes	Yes
Observations	294	294	275	294
R-squared	0.255	0.356	0.060	0.278
Panel (B)				
Consecutive	-0.203***	-0.268***	-0.232*	0.164***
	(0.0583)	(0.0707)	(0.125)	(0.0443)
Controls	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes
Observations	294	294	275	294
R-squared	0.333	0.430	0.226	0.366
Panel (C)				
Consecutive	-0.211***	-0.312***	-0.340***	0.194***
	(0.0592)	(0.0815)	(0.127)	(0.0486)
Controls	No	No	No	No
Fixed Effects	No	No	No	No
Observations	294	294	275	294
R-squared	0.047	0.049	0.027	0.051

*Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1*
Controls include: female male ration, married, Muslim, literate and rural.
Fixed Effects include: year and district.

7.5 State-level Regression

My last estimation in Table (6) evaluates the third research question; how a change in the proportion of reserved women from 33% to 50% impacts women's economic activity. However, I find no statistically significant result for this estimation, and it might depend on the small sample size. The sample size is remarkably small for this method; therefore, it is suspected that I would have these insignificant results. I cannot say anything about the impact of a change in the proportion of reserved women from 33% to 50 % on women's economic activity. However, if I had a larger sample size and could evaluate more districts, results may be different and in line with my hypothesis.

Table 6: DD regressions, using OLS, evaluation of the effect of having a female chairperson on state-level.

VARIABLES	(1) LFPR	(2) Paid work	(3) Unpaid work	(4) Domestic duties
Panel (A)				
State Chairperson	0.0613	0.268	-0.103	-0.158**
	(0.0833)	(0.178)	(0.159)	(0.0536)
Controls	No	No	No	No
Fixed Effects	Yes	Yes	Yes	Yes
Observations	48	48	48	48
R-squared	0.006	0.053	0.009	0.085
Number of State	6	6	6	6
Panel (B)				
State Chairperson	-0.192	-0.138	-0.0942	0.0428
	(0.106)	(0.112)	(0.157)	(0.0278)
Controls	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes
Observations	48	48	48	48
R-squared	0.402	0.681	0.282	0.864
Number of State	6	6	6	6
Panel (C)				
State Chairperson	-0.239	-0.162	-0.509**	0.0962
	(0.151)	(0.208)	(0.226)	(0.110)
Controls	No	No	No	No
Fixed Effects	No	No	No	No
R-squared	0.052	0.013	0.100	0.016

*Robust standard errors in parentheses: *** $p<0.01$, ** $p<0.05$, * $p<0.1$*
Controls include: female male ration, married, Muslim, literate and rural.
Fixed Effects include: State and year.

8. Robustness

I will now further evaluate the relationship between gender quota reform and women's economic activity status by performing robustness checks. For the method, I have chosen and discuss some more issues with my data.

I have some restriction problems in my data regarding the reservation status for women among the districts since I have used a data set collected and used by (Iyer et al., 2012). The districts are as mentioned in section 5 changed from 1987 to 2012, and therefore Iyer et al. (2012) had merged the districts. The reservation status is then in parts since I cannot exactly know which district is reserved for women and which not, I had to round of the parts to approximate numbers. For instance, a district that is merged with three different districts and two out of these

three districts are reserved for women; I have to account for all the three districts as reserved for women even if of the district is not. These parts create a problem since it is harder to compare the districts to each other, I will therefore only examine the three states[28] that I have collected from the State Election Commission from 2000-2012 and make the same estimation as in Table (4).

As we can see the result in the Table (A.9) presented in the appendix section, the estimated result show statistical insignificance on all coefficients. In Table (A.9), one of the four outcome variables are of statistically significance. This result implies that I find no statistically significant positive effect of having a woman as chairperson on women's economic activity. Arguably, this result could be due to the small sample size in this robustness test. It could also be because I am only estimating three states and these states might not be a good representation for estimating the effect of the gender quota on women's economic activity. Since these states might suffer from state characteristics that prevent women from having a job, like for instance, distance to work and access to child daycare.

8.2 Logit model and multinomial logit model

In the second robustness check, I compare my independent variables once and tw*ice* in a Logit model on the dependent variable LFPR. In Table (A.11) in the appendix, we can see that the estimated marginal effect of having a female leader is negative. In the districts with a female chairperson during one election period, the women are 21.8 % less likely to participate on the labour market respectively 0.8 % for the district with a female chairperson during at least two election periods, compering to the district that never had a female chairperson. These results are unexpected and not in line with the earlier estimated results.

I also estimate the three other dependent variables: *Paid work, unpaid work and domestic duties* in a multinomial logit model. In Table (A.13) shows the estimated marginal effects of the outcome variables. In the districts with a female chairperson during one election period, the women are 19.2 % less likely to have a *paid work* respectively 10.3 % for the district with a female chairperson during at least two election periods, compering to the district that never had a female chairperson. For the variable *unpaid work*, women are 10.1 % less likely to have *paid work* in districts with a female chairperson once respectively 4.9 % for the district with a female chairperson *twice* or more. The share of women is 29.3 % more likely to only attain domestic duties in districts with a female chairperson once respectively 15.2% in the districts with a female

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[28] Andres Pradesh, Haryana and Rajasthan

chairperson twice. These results are also unexpected and the opposite to my earlier results when using the OLS models. This means that the data are sensitive and not robust since the result change remarkably to the opposite results. Arguably, the OLS model estimates a sample size on 1,028 observation while the logit model estimates a sample of 652,447 observations. This massive change in number of observations might impact the results differently.

9. Conclusion

The main objective of this paper is to provide causal evidence on the effect of women's political reservation on women's opportunities in the labour market. I use survey data from India on women's reservation status of being elected as chairperson of the district and data on women's economic activity status. The outcome variables used in this study are different variables from the NSSO, a government of India survey on economic activity status.

The first method evaluates if the districts are differently affected depending on the chairperson seat and if it is reserved for women during an election period or not. Furthermore, these results show no evidence of an improvement in women's economic activity; this might be because the effect of a female political reservation might take a long time to eventuate. Therefore, I next use another method, where I compare the districts that never were reserved for women, with the districts that was reserved once and those that were reserved twice. In the third method, I examine how a change in the proportion of reserved women from 33 % to 50 % impact women's economic activity. I estimate the variation in the implementation of the expanded gender quota reform between different states in India.

The result presented from the first research question shows a statistically insignificant effect from the gender quota reform on women's economic activity. Nevertheless, the second research question shows a positive and statistically significant effect on women's economic activity in the districts that had a female leader once or twice compared to the districts that never have had a female leader. They were also less likely only to attend domestic duties as their primary activity. The districts that had been reserved twice had the most considerable effect on women's economic activity; this result implies that women's political reservation has a positive effect on women's economic activity. It was in line with the hypothesis. The result from evaluating if having a woman as chairperson in two consecutive election periods compared to having a woman as chairperson during two inconsecutive election periods showed a statistically significant and negative result. Further, this was unexpected relative to the extant hypostasis. Further, I find

no evidence that an increase in the quota from 33% to 50% reserved seats for women had an impact on women's labour force participation.

The main issue in estimating my hypothesis was the lack of data on the reservation status for women at the district. Hence, I had to use an old dataset collected by Iyer et al., (2012), which had some limitations. I could only obtain data for the years 1987-2012 for six districts, and since the districts are merged since 1987, I could not distinguish precisely which districts had women reserved[29]. To try to control for this, I performed a robustness check on the three districts[30] for the years 2000-2012 to estimate if the result shows similar results. Unfortunately, it did not, and the result was not statistically significant; this might be due to its small sample size. I also evaluate my second model by a Logit and Multinomial logit model, the results show almost the opposite results compared to the DD estimation, this shows evidence that the results are not robust.

Finally, there are some results showing that women's political representation has a statistically significant and positive effect on women's economic activity. The results are not robust to all the robustness checks. However, the result shows some evidence on causality in the OLS regression when including control variables due to similar results by including controls and excluding fixed effects this might shows evidence that the results are unbiased. For future research, I recommend, other researchers to investigate the reasons behind the positive effect of women's political reservation on women's economic activity. It requires further study to know the reason for the changes if it depends on the change in social norms, women participate in decision-making by, for instance, increase child daycare which enables women to work outside their home. I believe, knowing the reasons would bring vital information for policymakers intervention decision and further investigation in the topic is required.

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[29] More about this method in section 4.
[30] Andres Pradesh, Haryana and Rajasthan

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Appendix - Variable description

Table A.9: Usual principal activity status

Usual principal activity status
Workers (or employed): includes all persons that were engaged in any economic activity for a relatively long period during the 365 days before the interview were taken. All the persons that answer in the principal activated 11-71 were categorized as workers Persons who temporary default from the attendance in economic activity due to illness or other physical
Not working but seeking/available for work (unemployed): include all persons that where answering 81-82
Neither working nor available for work (or not in labour force): include all the persons that answering 91-95

Note: The answers that can be given to the questions are the following: 11-" Worked in hh. Enterprise (self-employed) as own-account worker", 12- "Worked in hh. Enterprise (self-employed) as employer", 21- "Worked as helper in hh. enterprises (unpaid family worker)", 31- "worked as regular salaried/wage employee", 41- "Worked as casual wage labour : in public works", 51- "Worked as causal wage labour: In other types of work" 81- "Did not work but was seeking and/or available for work" 91- "Attended educational institutions" 92- "Attended domestic duties only" 93-" Attended domestic duties and engaged in free collection of goods for hh. Use" 94-" Rentiers, pensioners, remittance recipients, etc." 95- Not able to work due to disability" 97 "Beggars, prostitutes" 15 "Others" 99- "children age 0-4" (I will exclude those).
Source: Computed from Household Survey data of NSSO 68th Round

Appendix – Robustness Checks

Table A.9: Including the districts Andres Pradesh, Haryana and Rajasthan for years 2000-12

VARIABLES	(1) LFPR	(2) Paid work	(3) Unpaid work	(4) Domestic duties
		Panel (A)		
Once	-0.0132	0.130	-0.0551	-0.0484
	(0.0403)	(0.0928)	(0.125)	(0.0494)
Twice	-0.130**	-0.238**	-0.266*	0.157***
	(0.0504)	(0.0967)	(0.158)	(0.0509)
Controls	No	No	No	No
Fixed Effects	Yes	Yes	Yes	Yes
Observations	408	408	384	408
R-squared	0.396	0.488	0.052	0.401
Once	-0.0132	0.130	-0.0551	-0.0484
	(0.0403)	(0.0928)	(0.125)	(0.0494)

	Panel (B)			
Once	0.0518	0.140	0.119	-0.0936**
	(0.0361)	(0.0853)	(0.119)	(0.0450)
Twice	-0.0201	-0.182*	0.0271	0.0657
	(0.0463)	(0.0934)	(0.145)	(0.0481)
Controls	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes
Constant	-1.067***	-2.025***	-2.268***	-1.191***
	(0.309)	(0.554)	(0.808)	(0.299)
Observations	408	408	384	408
	Panel(C)			
Once	-0.0132	0.130	-0.0501	-0.0484
	(0.0549)	(0.121)	(0.126)	(0.0646)
Twice	-0.130*	-0.238*	-0.264	0.157**
	(0.0681)	(0.136)	(0.160)	(0.0697)
Controls	No	No	No	No
Fixed Effects	No	No	No	No
Observations	408	408	384	408
R-squared	0.011	0.033	0.010	0.038

Robust standard errors in parentheses:
*Significance levels: *:10% ***:5% ***:1%*
Controls include: female male ration, married, Muslim, literate and rural.
Fixed Effects include: year and district.

Table A.10 Robustness check with Logit model

VARIABLES	(1)
Reservation status	LFPR
Once	-0.9551***
Twice	-0.3624***
Controls	Yes
Fixed Effects	Yes
Number of observations	734,335
Pseudo -	0.0407

*Significance levels: *:10% ***:5% ***:1%*
Controls include: female male ration, married, Muslim, literate and rural.
Fixed Effects include: district.

Table A.11 Marginal Effects at Means - Logit model

VARIABLES Reservation status	(1) LFPR
Once	-0.2179***
Twice	-.00827 ***

*Significance levels: *:10%   ***:5%   ***:1%*

Table A.12 Robustness check with Multinomial Logit model

VARIABLES Reservation status	(1) Paid work	(2) Unpaid work	(3) Domestic duties
	Panel (A)		
Once	-1.2149***	-1.7617***	Base-outcome
Twice	-0.6353***	-0.8861***	Base-outcome
Controls	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes
Number of observations	652,447	652,447	652,447
Pseudo -	0.0321	0.0321	0.0321

*Significance levels: *:10%   ***:5%   ***:1%*
Controls include: female male ration, married, Muslim, literate and rural.
Fixed Effects include: district.

Table A.13 Marginal Effects at Means – Multinomial Logit model

VARIABLES Reservation status	(1) Paid work	(2) Unpaid work	(3) Domestic duties
	Panel (A)		
Once	-0.1924***	-0.1010***	0.2934***
Twice	-0.1028***	-0.0493***	0.1521***

*Significance levels: *:10%   ***:5%   ***:1%*