

Essays on Gender, Development and Political Economy

Divya Dev



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Divya Dev

Academic dissertation for the Degree of Doctor of Philosophy in Economics at Stockholm University to be publicly defended on Friday 24 September 2021 at 10.00 in hörsal 4, hus B, Universitetsvägen 10 B.

Abstract

The Long-Run Impact of Protestant Missionary Activity on Female Labour-Force Participation

Research has shown that missionary activity, in general, and Protestant missionary activity, in particular, has had a long-lasting positive effect on literacy, education and democratic values. In this chapter, I analyse the differential effect of early 20th century Protestant and Catholic missionary activity in three former British colonies - Kenya, Tanzania and Uganda - on female labour-force participation with a particular focus on formal-sector employment. Using survey data, I find that Protestant missionary activity, compared to Catholic missionary activity, has a persistent positive relationship with education, especially for women and girls, is associated with greater female empowerment within the household and increases in the likelihood that women are employed full time, in non-agricultural skilled work and that they earn cash wages. Furthermore, with a novel dataset on public sector employees in Tanzania, I find that greater Protestant missionary activity, as measured by the number of Protestant mission stations in a district, is positively related to higher shares of female employees, especially civil servants, and an increase in the likelihood that a Local Government Authority is led by a woman.

The Impact of Reservation on Female Representation - Evidence from Uttar Pradesh

India has a policy of reserving certain political positions for women and marginalised caste-groups which has increased their representation in local governments. In this chapter, I use the rotating design of India's reservation policy to estimate what happens in the election following reservation. I explicitly look at reservation for women with and without caste restrictions separately. I find that in the election following reservation for women there is an increase in the share of women mayors with particularly strong effects for lower-caste women where the share of lower-caste women mayors increases by 80%. I find limited evidence that this is driven by the re-election of incumbents but, instead, that it is driven by increases in the quality and quantity of candidates. In the election following reservation for women, I estimate an increase in the number of candidates and their quality, as measured by literacy, for both male and female candidates.

Voting from Abroad: Assessing the Impact of Local Turnout on Expatriates' Voting Behaviour

Over 150 countries allow expatriate citizens to vote in their country of origin. Yet, little is known about their voting behaviour and how this is affected by host countries. Using unique micro-data on Chilean expatriates living in Europe, we study how the host country's turnout affects expatriates' electoral participation in the 2017 Chilean Presidential election. We focus on the 2014 European Parliament election turnout in the district of the Chilean's geocoded residence and exploit local transitory shocks to the cost of voting given by the rainfall on the day of the election. We find that a 1 percentage point increase in the host country's turnout decreases the electoral participation of Chilean expatriates by nearly 1 percentage point. This suggests a trade-off between political engagement in host country and home country politics. We find a stronger impact for young Chileans and those living in small communities, and in localities more welcoming to migrants.

Keywords: *reservation in India, missionary activity, expatriate voter participation, Chilean presidential election, Tanzanian public sector, representation of women, female labour-force participation.*

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ESSAYS ON GENDER, DEVELOPMENT AND POLITICAL
ECONOMY

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For my family

Doctoral Dissertation
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Abstracts

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Introduction

This thesis is comprised of three self-contained essays. Chapters 1 and 2 are focused on the drivers and impact of women's participation in the public sector. While Chapter 1 explores historical reasons affecting present-day female labour-force participation with a particular focus on the public sector in East Africa, Chapter 2 analyses the effects of a targeted policy to increase the share of women in local government in India. Chapter 3 is somewhat different. It is a study of expatriate voting behaviour among Chileans living in the European Union.

Although all three chapters are quite different, there is a common theme that runs through all three which is the focus on the public sector and government which has been at the centre of my research interests.

The Long Run Impact of Protestant Missionary Activity on Female Labour-Force Participation

In this first chapter I study the differential impact of historical Protestant and Catholic missionary activity on present-day female labour-force participation in three former British colonies in East Africa - Kenya, Tanzania and Uganda. Missionaries played a central role in providing education throughout the colonial period and Protestant missionary activity, in particular, has been found to have had a persistent and larger effect on literacy, education and democratic values. This has mainly been attributed to the Protestant belief that an individual must be able to read the Bible in order to access the Word of God (*Sola Scriptura*). In my analyses, I estimate the relative effect of Protestant missionary activity,

as compared to Catholic missionary activity, on female education, empowerment within the household and labour-force participation, with a particular focus on formal employment, in East Africa.

Using data on the locations of Catholic and Protestant mission stations in the early twentieth century alongside survey data, I compare the outcomes of respondents living in villages with Protestant missionary activity to those with Catholic missionary activity. I find that female respondents who live in villages with historical Protestant missionary activity have more years of education and are more likely to have finished at least primary school. Furthermore, I also find that women in these villages are less accepting of domestic violence and are more likely to have a say in household financial decisions, including how to spend money from their own salaries.

The positive relationship between Protestant missionary activity and female education as well as greater female empowerment carries forward into higher rates of female labour force participation. Women who live in villages with a Protestant mission station are more likely to be employed full time, in non-agricultural skilled work, and earn cash wages. Although these effects are based on self-reports and are an imperfect measure of formal employment, they constitute suggestive evidence that Protestant missionary activity is positively associated with female labour-force participation particularly in the formal sector.

Finally, in order to get somewhat closer to understanding how historical missionary activity relates to female formal-sector employment, I build a novel dataset that has the share of female public sector employees in every district (Local Government Authority office or LGA) across mainland Tanzania. I find that districts with Protestant missionary activity have a larger share of female employees. Moreover, these districts are also significantly more likely to be headed by a female manager (District Executive Director).

This chapter contributes directly to the literature on the long-term effects of missionary activity. It adds to this literature by first replicating the effects of Protestant missionary activity on

female education and empowerment in the East African context. Furthermore, it puts forward a new aspect of the long-term effects of Protestant missionary activity in how it relates to female labour force participation. It also fits in with the literature on Protestantism and female education. Finally, this chapter also speaks briefly to the literature on the public sector employees from the perspective of a potential driver of the female share of employees and female managers.

The Impact of Reservation on Female Representation -Evidence from Uttar Pradesh

In 1993, India introduced a policy to improve the representation of women and marginalised caste-groups in local government. The policy means that in any given election cycle, a certain share of village mayoral posts is *reserved* for women, marginalised caste-groups or some combination of the two. The reservation of these mayoral posts rotates from one election cycle to another so that the same village mayoral position should not fall under the same reservation category in two consecutive elections. This policy design creates a natural experiment that I use to estimate what happens in the election cycle where the village mayoral post is unreserved following one in which the village mayoral post was reserved for women.

Using data from India's most populous state, Uttar Pradesh, I estimate that villages that were reserved for women mayors in one election cycle are more likely to elect a woman in the next election cycle. This is particularly apparent for lower caste women from the "Other Backward Classes" (OBC) caste group. Exposure to an OBC woman mayor through reservation in one election cycle raises the likelihood of electing an OBC woman in the next election cycle, without reservation, by 80%.

This increase in the likelihood of the election of women in an unreserved village after reservation is at most only partially explained by the re-election of incumbents. All women village mayors elected through reservation, both with and without caste restrictions, are significantly less likely to compete in the next election when the mayoral post is un-

reserved. However, conditional on competing, women mayors who were elected through reservation that was only gender-based, meaning there were no caste-based restrictions, are just as likely to be re-elected as unreserved mayors. This suggests that there is some potential positive selection in which incumbent mayors choose to compete in the next election.

In addition to selection and re-election of incumbents, I find that in the election cycle after an election with reservation for women, there is a change in the pool of candidates. There is an increase in the quantity of candidates including an increase in the number of women candidates, and following reservation for lower-caste women, an increase in the number of lower-caste women candidates. Furthermore, I also estimate an increase in the quality of candidates, as measured by literacy. The literacy rate in rural Uttar Pradesh is around 55% and thus literacy is non-trivial in this context. Interestingly, I find an increase in the number of literate candidates among both men and women.

This chapter contributes most specifically to the literature on India's reservation policy but also more broadly to the literature on the effects of affirmative action policies that are targeted at increasing the representation of women in politics. It makes two main contributions, the first is to explore the effects of reservation on increasing the representation of women considering gender-based reservation and combined caste-based and gender-based reservation separately. The second is to document the broader effects of reservation on electoral competition with respect to the quantity and quality candidates.

Voting from Abroad: Assessing the Impact of Local Turnout on Expatriates' Voting Behaviour

with Rubén Poblete Cazenave and Alessandro Toppetta

In the third chapter, we study expatriate voting behaviour in the context of Chilean expatriates living in the European Union (EU). More than 150 countries allow their citizens to vote from abroad, yet the motivations of these expatriate voters have been relatively understudied.

We are interested in understanding the voter participation of Chilean expatriates and, in particular, how this is affected by voter turnout in EU elections.

We build a dataset that has the locations of all registered Chilean voters who live in the EU and link them to the corresponding local level turnout in the 2014 EU parliamentary election. We focus on turnout as it is considered to be a key indicator of the quality of a country's democratic processes. In order to estimate a causal effect of the turnout in the 2014 EU election, we exploit a transitory shock to the cost of voting in the EU election, namely rainfall on the election day.

We find that a one percentage point increase in the turnout in the 2014 EU election results in a nearly one percentage point decrease in the turnout in the 2017 Chilean Presidential election among Chilean expatriates living in the EU. This negative effect supports the *zero-sum* argument which says that more inclusive countries decrease migrants' attachment to their home country politics.

To understand if there is additional suggestive evidence in support of this theory, we first use differences in the demographics and environmental factors of the Chilean voters. We find that the effects are larger among young Chilean voters, Chileans who live in rural areas and those who live in smaller communities in their country of residence are the most affected. Furthermore, we also find that the effects are larger among Chileans whose partners are not Chilean and among those who reported that language was not a difficulty they faced while migrating. Next, we also explore whether the magnitude of the effects differs according to how open the receiving population is to migrants. For this purpose, we use survey data and find that in areas where respondents report that they are more open to migration and believe that migrants enrich the local culture, the effects of the 2014 EU turnout on the Chilean turnout are larger. This provides some suggestive evidence that supports the theory that as Chileans are more integrated into their country of residence, this comes at the cost of their attachment to Chile.

Finally, we also consider the correlation between the local EU turnout

and some secondary outcomes that might also shed some light on the mechanisms we consider. In line with our previous findings, we document that higher local turnout in the EU elections is positively correlated with Chileans participating in local community organisations as well as higher interest in politics among host country respondents.

This chapter contributes to a few different strands of literature. It is most closely connected to a relatively new branch of research that is focused on how migration affects the politics in the migrants' countries of origin. The main contribution comes from estimating a negative causal relationship between expatriate voter turnout and local turnout, thereby highlighting that not only are the political preferences of expatriates affected by where they live but also their decision to participate in their home country politics at all. More generally, it contributes to the literature on electoral participation and its determinants, in particular the role of society and its influence on individual voter turnout. We contribute to this by studying a different setting wherein a large share of an individual's social network cannot participate in the election and find evidence that even in this type of context, social influences play a role in the decision to vote.

Chapter 1

The Long-Run Impact of Protestant Missionary Activity on Female Labour-Force Participation

1.1 Introduction

Across the world, there is a substantial gender gap in labour-force participation - according to the International Labour Organisation (ILO), while 75% of men are employed the comparative figure for women is only about 48% . Furthermore, in developing countries, women are particularly under-represented in the formal sector - for example in Tanzania, women make up about 37% of formal-sector employment.¹ While there are many reasons for these gaps, in this chapter I focus on a specific historical driver, the role of missionary activity, in particular Protestant missionary activity, and its effects on women's labour-force participation.

¹The World Bank Development Indicators show that 70% of female employment is in agriculture, and 76% of non-agricultural female employment is informal meaning that overall the share of female labour that is in formal employment is approximately 7.2%. The comparative figure for men is 12%.

Throughout the colonial period, missionary activity played a central role in providing access to schooling and healthcare. For example in Ghana in 1950, an estimated 97% of school enrolment was in schools run by missionaries (Berman, 1974). Consequently, research has found a persistent positive relationship between missionary activity and schooling and literacy. Protestant missionary activity, in particular, has been linked to higher present-day literacy rates (Cagé and Rueda, 2016), higher levels of schooling (Gallego and Woodberry, 2010, Okoye and Pongou, 2014), especially for women and girls (Nunn et al., 2014), more equitable gender attitudes (Caicedo, 2019), and more democratic values (Woodberry and Shah, 2004). Moreover, in Europe, the spread of Protestantism resulted in a decrease in the gender gap in education (Becker and Woessmann, 2008). However, thus far, limited attention has been given to how Protestant missionary activity may affect female labour-force participation in former colonies. In this chapter, I study this question by analysing the differential impact of Protestant and Catholic missionary activity in Kenya, Tanzania and Uganda, three former British colonies in East Africa, on female education, empowerment within the household and labour-force participation, particularly in the formal sector. In order to focus on formal-sector employment, I study employment in the Tanzanian public sector as it constitutes a substantial share of formal employment; in Tanzania, nearly half of all formal employment is in the public sector.² For my analyses I use data on missionary activity from the early 20th century (Roome, 1924), survey data from the Demographic and Health Survey (DHS) and the Afrobarometer and a novel dataset that covers all public sector employees in Tanzania.

As the first step, I follow the existing literature (Cagé and Rueda, 2016, Nunn et al., 2014, Gallego and Woodberry, 2010) and study the relationship between historical Protestant and Catholic missionary activity and education. I estimate a positive effect of both types of missionary activity on schooling. Women who live within twenty-five kilometres of a

²Women make up about 35% of the public sector employees in Tanzania (Tanzania National Bureau of Statistics, 2016).

mission station have, on average, 1.5 additional years of schooling compared to women who live in areas without missionary activity. Moreover, looking at the effects by missionary type, I find that women who were exposed to only Protestant missionary activity benefited to a greater extent than those exposed to only Catholic missionary activity. The former is associated with an increase of 0.94 additional years of schooling while the comparative effect for the latter is nearly forty percent lower (0.58 additional years of schooling) and women who live in areas where there was both Catholic and Protestant missionary activity benefited the most. This last group of women have on average 1.3 additional years of schooling compared to those living close to only one type of missionary and nearly 2 additional years of schooling compared to women in areas without any missionary activity. This result is in line with existing research on former colonies where the positive effects of both types of missionary activity on education were of relatively similar magnitude when missionaries had to compete with one another (Gallego and Woodberry, 2010).

Moving beyond education and examining various measures of female empowerment within the household, I find evidence that these also differ by missionary type: specifically Protestant missionary activity is associated with greater inclusion of women in decisions of household finances, smaller age differences between spouses and greater disapproval of domestic violence. I estimate that relative to areas without missionary activity, areas with historical Protestant missionary activity only have an associated increase of 7.6 percentage points (17%) in women's disapproval of domestic violence whereas the comparative measure for areas with Catholic missionary activity only is 3.8 percentage points (8.5%). The effects of Protestant missionary activity only on women's participation in household financing decisions is even clearer. In areas with Protestant missionary activity only, women are 1.7 percentage points (23%) more likely to have a say in how to spend the money from their salary, 3.7 percentage points (7%) more likely to have a say in large household expenses and 3.4 percentage points (5.5%) more likely to have a say in daily expenses compared both to villages with only Catholic

missionary activity and those without missionary activity. At the same time, it is perhaps worth keeping in mind that the latter two effects are eroded in villages with both Catholic and Protestant missionaries. While the positive effects of historical Protestant missionary activity on these measures of empowerment have not been studied in Africa, similar effects have been found in India (Calvi et al., 2020).

In addition to education, Protestant mission stations in the early 20th century provided some of the first employment opportunities for women outside of home-making (Meier zu Selhausen, 2014). Having established the positive effects of historical Protestant missionary activity on women's education and position within the household, I turn to its impact on female labour-force participation. Using self-reported employment data from the DHS survey, I study the effect of historical Protestant and Catholic missionary activity on the likelihood that a woman is employed full-time, whether she is employed in non-agricultural skilled work and whether she is paid cash wages. These measures work as a proxy for employment in the formal-sector and I estimate that living close to a Protestant mission location increases the likelihood that a woman is employed full time by about 8.6 percentage points (13.5%), that she is engaged in non-agricultural skilled work by 10 percentage points (29%) and that she earns cash wages by 10 percentage points (20%). Although these variables are imperfect measures of formal-sector employment, they present evidence of a lasting significant positive effect of Protestant missionary activity on women's employment. The comparative effect of Catholic missionary activity on each of these measures of employment is on average 50% lower. Similar to the effects on education, villages with both Protestant and Catholic missionaries are associated with a greater increase in these measures of female labour force participation.

Finally, in order to explore the effects of Protestant missionary activity on public sector employment further, I rely on employment data from the Tanzanian civil service which covers all public sector employees. I use this to calculate the share of female employees at all Local Gov-

ernment Authority (LGA) offices in mainland Tanzania.³ I find that for every Protestant mission location within the LGA, the share of female employees increases by 1 percentage point with the effect on civil servants being almost double that of front-line employees. The comparative effect of Catholic mission stations is zero. It is worth noting that the Tanzanian civil service has a relatively high share of female employees, approximately 44%, and therefore it is not clear if this increase is necessarily meaningful. Therefore, I also estimate if there is a differential effect on the likelihood of having a woman in a leadership position. In spite of the relatively high share of women in the civil service, only 15% of LGAs in Tanzania are led by women. I find that LGAs with Protestant missionary activity are significantly more likely, nearly 9 percentage points, to have a woman as the head of the LGA. The large magnitude of this effect should be interpreted with caution; however, it is indicative of areas with Protestant missionary activity having higher share of more qualified women and/or being more receptive to female leadership.

Overall, I find a strong positive relationship between Protestant missionary activity and female labour-force participation but the question of how this relates to its effects on education and empowerment still remains. To shed some light on this, I look at the relationship between female employment and education and empowerment within the household. Setting the same measures of female employment as outcome variables,⁴ I find that both education, measured as years of schooling, and the various measures of female empowerment within the household, have positive and statistically significant coefficients. Furthermore, the coefficient of the latter remains largely unchanged when the former is added to the estimation suggesting, that both channels may play somewhat separate roles. However, at the same time, the consistency of the effects of Protestant missionary activity on education and employment suggests

³LGAs constitute the third lowest Tanzanian administrative level and are the lowest level of centralisation where budgets are created and funds are disbursed.

⁴These are the same as those used in the main results are refer to self-reported employment measures of whether a woman works full time, whether she is employed in non-agricultural skilled labour, and whether she earns cash wages.

that education may be playing the more important role.

The results presented in this chapter build on the extensive existing research on the long-term effects of missionary activity, in particular of Protestant missionary activity, on literacy, education and gender norms. The positive link between missionary activity in the colonial period and human capital has been found in a number of settings from South America (Caicedo, 2019), to Africa (Cagé and Rueda, 2016, Nunn et al., 2014, Gallego and Woodberry, 2010), via India (Singh, 2013). While for all types of missionaries, providing essential services such as healthcare and education was arguably mainly motivated by a desire to gain converts, the link between Protestantism and increased literacy runs a little deeper. This positive relationship has been documented in both Europe (Becker and Woessmann, 2009) and colonial Africa (Cagé and Rueda, 2016) and has been attributed to the Protestant belief of *Sola Scriptura* - that reading the Bible alone is the way to understand the Word of God (Calvi et al., 2020). And, as a result, Protestant missionary activity has been linked to higher schooling levels in some African countries. Gallego and Woodberry (2010) show that this differential effect comes from countries where the former coloniser had policies that favoured Catholicism (Belgium, France, Portugal and Spain). Interestingly, Becker and Woessmann (2008) also highlight the role that the spread of Protestantism played in reducing the gender gap in education in early-nineteenth-century Prussia and Nunn et al. (2014) estimate that early-twentieth-century Protestant missionary activity, unlike Catholic missionary activity from the same period, had a particularly positive effect on female education in a number of countries across the African continent. Moreover, Guarnieri and Rainer (2021) show that former British colonies, in contrast to former French colonies, were much more effective at creating employment opportunities for women and this has had long-term effects. Finally, Calvi et al. (2020) find that areas exposed to Protestant missionary activity in India during colonialism score higher on a gender parity index. This chapter adds to this literature by extending the analyses of missionary activity on gender norms and linking this to female labour-force participation.

At the same time, there is a burgeoning literature on the importance of civil servants in the implementation of policy (Finan et al., 2017) - their ability to affect service delivery through a number of channels including management practices (Rasul and Rogger, 2018) as well as differences in career concerns (Bertrand et al., 2020, Nath, 2015) and explicit incentives (Khan et al., 2019). This chapter explores a potential driver of the geographical disparity in the representation of women in the public sector in Tanzania, namely historical Protestant missionary activity. Given the research on the importance of women in government (like Chattopadhyay and Duflo, 2004, Clots-Figueras, 2011), the selection of women into public sector employment has remained largely unexplored. Part of the reason is that the existing research on civil servants has been focused on countries such as India (Nath, 2015) and Pakistan (Khan et al., 2019) where, unlike Tanzania, the share of women in the civil service is, from an analysis perspective, restrictively low.

Finally, the work presented in this chapter also speaks briefly to the literature on female employment. Goldin (1995) shows how each subsequent generation of women is more ambitious than the preceding one. I believe that it is through such channels that historical "treatments" like Protestant missionary activity continue to have relevance today.

The rest of this paper is organised as follows. Section 1.2 provides background information on missionary activity and public sector employment in Sub-Saharan Africa, and on Tanzania and the Tanzanian civil service. Section 1.3 described the different sources of data used in this paper. Section 1.4 presents the estimating equations and the results of missionary activity on education, empowerment, employment, and the share of women in the Tanzanian public sector. Finally, this chapter concludes with Section 1.5.

1.2 Background

1.2.1 Missionaries in Africa

During the 19th and 20th centuries, missionary activity in Africa grew rapidly (Nunn, 2010). Missionary activity began before colonisation, and it continued to expand its influence and tended to work in tandem with colonial activity. The missionaries' primary objective was religious conversion and to spread the teachings of the Bible. The main tool they used for this was by providing key services like education and health (Cagé and Rueda, 2016). Since most colonizers did not invest in the schooling of local people, education became the main tool that missionaries used to bring people into the church and, in turn, schools run by missions became the main source of access to Western education and, subsequently, potentially, society (Nunn, 2010). The impact of missionaries on education provision was so vast that in the mid 20th century, the school going population was almost exclusively enrolled in schools run by a mission (Berman, 1974)⁵. Moreover, competition between Catholic and Protestant missions to gain converts translated into improved quality of education in mission schools. Protestant mission schools excelled, in particular, in regions where the Catholic colonisers had policies that favoured Catholic missions (Gallego and Woodberry, 2010).⁶

Although the location of missionary settlements, and therefore schools, was not random, it was largely based on geography, climate, and followed colonial explorer routes (Nunn, 2010). The first missions tended to be along the coast and subsequent missions slowly moved inland. The climate was particularly important due to the prevalence of diseases like malaria in the more tropical climatic zones. Thus, missions

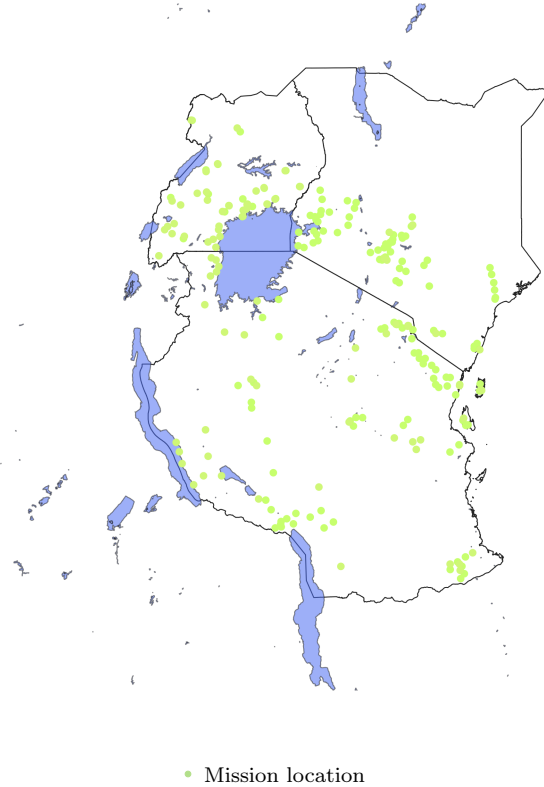
⁵For example, in 1950 in Ghana, 97% of the total school enrolment was in missionary schools. Similarly, in South Africa, in 1945 there were 5360 mission run schools versus 230 state run schools (Berman, 1974).

⁶The flip-side of this argument also holds true. In countries that did not have policies that favoured Catholic missions, for example in ex-British colonies, there is no measurable difference in the effects of missionaries on education by missionary type (Gallego and Woodberry, 2010).

were more frequently located at higher altitudes and in areas that had more temperate climates similar to those found in Europe. As the missions spread across the African continent, Roome (1924) created a map of their locations (Figure 1.1) which was regarded as highly accurate by experts in the area (Nunn et al., 2014). While the map of the missions is not exhaustive, it succeeds in locating the vast majority of European managed mission location as those that are not included in the Roome (1924) map are missionary locations where the services were managed by Africans (Michalopoulos and Papaioannou, 2018).⁷

⁷It is possible that the omission of these mission locations creates a bias in the estimates presented later on, however, this bias would plausibly be downward. This is because if we assume that the effects of these African missions is similar to that of the European missions then they would raise the education level of the non-treated group. If, however, we think for some reason that they had an opposite effect compared to the European missions, this would be a potential issue, but this seems unlikely.

Figure 1.1: *The locations of mission stations (both Catholic and Protestant) in Kenya, Tanzania, Uganda (based on Roome, 1924)*



Interestingly, the positive effect of missionary activity on a variety of interlinked outcomes like education, trust and political engagement persists into the present day and has been documented by a number of different studies (Nunn et al., 2014, Gallego and Woodberry, 2010, Cagé and Rueda, 2016, Michalopoulos and Papaioannou, 2018). At the same time, the overall impact of Protestant and Catholic missionaries has not been the same. The effect of missionaries on political engagement has largely been due to Protestant missionaries and the printing press as the spread of the Bible did, in turn, lead to greater literacy rates and this meant that more people could read the newspaper (Cagé and

Rueda, 2016). Furthermore, Gallego and Woodberry (2010) find that in regions where regulations favoured Catholic missions, Protestant missions tried to garner more converts by providing higher quality services, especially education. Moreover, Nunn et al. (2014) explore the difference between the effects of Protestant and Catholic missionaries on education by gender - women living in areas where there was Protestant missionary activity have more years of schooling than both those located near Catholic missionaries as well as those located close to neither Catholic nor Protestant missions. He attributes this to the Protestant belief that in order to go to heaven, an individual must be able to read the Bible, irrespective of gender. The effect of Protestant missions on more equitable gender attitudes has been studied in the Indian context (Calvi et al., 2020), and Meier zu Selhausen (2014) estimates the positive effects of Protestant missionary activity on female empowerment in Uganda. He provides evidence that Protestant mission locations provided the first wage employment opportunities for women and this led to them marrying later in life and to men closer to their own age, which are suggestive indicators of more equitable power sharing within the household.

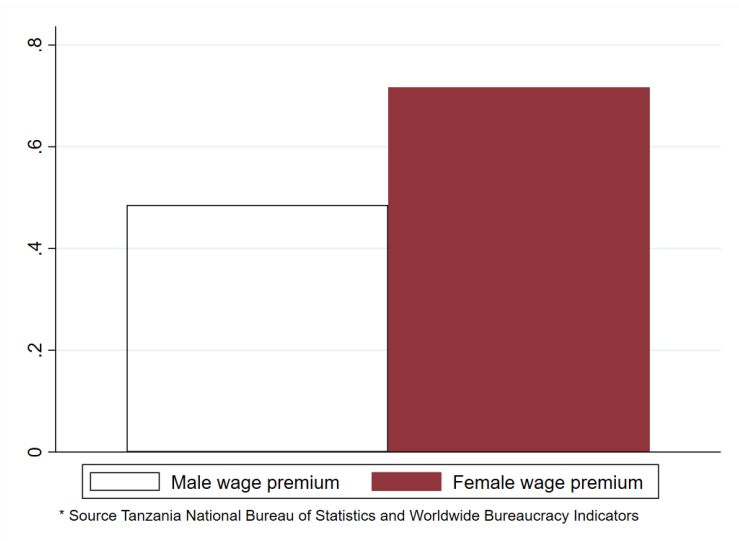
Overall, missionaries had a strong and persistent effect on the societies within which they worked.

1.2.2 Public Sector Employment

The public sector, especially in lower income countries, constitutes a substantial share of formal employment. According to the World Bank's Worldwide Bureaucracy Indicators, the public sector makes up an average of 50% of formal employment across 42 countries in Africa but women remain under-represented. For example, in Tanzania, about 44% of the labour-force in the formal-sector is in the public sector, however, women make up approximately 35% of public sector employees (World Bank, 2020). Moreover, there is a wage premium in the public sector, particularly for women. This latter point may be driven by the fact that more skilled women select into the public sector (Besley et al., 2017) and/or

that the private formal-sector employment for women simply pays lower wages. However, in both cases, this means that the public sector is an attractive job opportunity for women and contributes a large share of the formal employment opportunities. Figure 1.2 shows the wage premium by gender for the public sector over the private sector in Kenya, Tanzania, and Uganda. It shows that, on average, women in the public sector are earning over 70% more than those working in the private sector (restricted to formal employment). The premium over informal employment would be even greater.

Figure 1.2: Public sector to private sector wage premium by gender

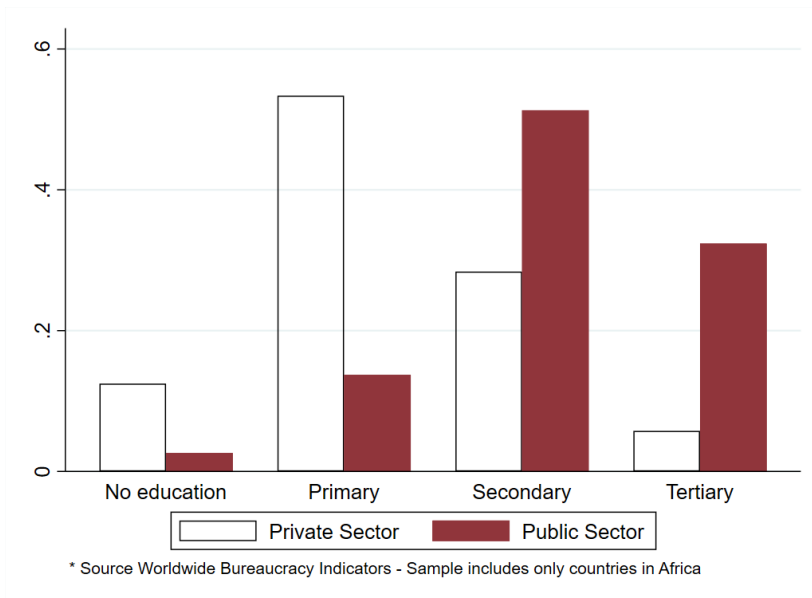


Furthermore, public sector employment is generally characterized by rigid rules and a tiered pay structure. The main reason for this is to insulate public sector employees from political change. However, these structures and rules provide additional benefits to public sector employees - first, for women, this means that they are able to get closer to equal pay, especially when compared to the private sector, and second, all employees enjoy very high job security when working for the public sector.

Given both the size of the public sector as an employer and the po-

tential wage premium it offers, it is somewhat unsurprising that the public sector attracts more highly educated individuals in most developing countries. Finan et al. (2017) highlight this as one of the key characteristics of public sector employment in the developing world, and the same pattern can be seen in Figure 1.3, which is based on data from Kenya, Tanzania and Uganda,⁸ where the education distributions of public sector employees is clearly shifted to the right of that of private sector employees.

Figure 1.3: *Education premium by sector*



Taken together, these characteristics highlight the importance of studying the public sector when analysing female employment in formal sectors in developing nations.

⁸Data from the World Bank (2020) shows that the pattern extends across the African continent.

1.2.3 Tanzania and the Tanzanian Civil Service

Since its independence in 1961, Tanzania has consistently had a large and prominent public sector. This is at least partly because the first President of Tanzania, Julius Nyerere, had a vision of African Socialism and developed policies that put cooperative initiatives and the public sector at the forefront. He remained in power for 24 years and his tenure shaped the country profoundly. Importantly, his focus on self-reliance resulted in the Tanzanian public sector being very large and thus, constituting the main employment opportunity for a majority of Tanzanians. After Julius Nyerere's retirement as president and since (approximately) that time the Tanzanian private sector has been growing consistently. However, the public sector remains a major player in the labour market for formal employment and, anecdotally, it is considered to be the modal choice of employment for educated Tanzanians.

In Tanzania, the public sector employs approximately seven hundred thousand individuals and so constitutes around 44% of total formal employment in the country (World Bank, 2020). Similar to public sector employment in most other countries, in Tanzania, individuals employed by the government enjoy high job security, a wage premium, and a number of additional benefits like health insurance and a pension scheme. Thus, working for the Tanzanian public sector is an attractive employment opportunity. Joining the civil service in Tanzania is considered to be a standard career path for educated individuals.

Tanzania's public sector is divided into three levels of administration - the central, the regional and the local (Local Government Authority or LGA). There are 26 regions subdivided into 186 LGAs in mainland Tanzania.⁹ The LGAs are the lowest level of public sector administration and are responsible for service delivery at the local level as well as budget formulation and implementation (Decentralisation by Devolution). They are responsible for managing healthcare, education, and water provision

⁹The island of Zanzibar has its own administration that functions separately from that of mainland Tanzania.

services for their areas. In order to do this, they receive funding from the central government ministries via the appropriate regional government authorities. LGAs wield substantial power over the quality of services in Tanzania. LGAs also make up a large share of public sector employment.

1.3 Data

Mission Stations and their locations: The data on mission locations in the early 20th century are from Roome (1924). The Roome (1924) map is considered by experts to be an accurate and comprehensive representation of missionary activity across the African continent at the time and has been used by a number of scholars in the literature (Nunn, 2010, Nunn et al., 2014, Montgomery, 2017, Okoye and Pongou, 2014). The missions included in this map are those that were established by foreign missionaries with the intent to educate, serve, and convert local populations (Nunn et al., 2014)¹⁰.

The locations of missionaries were not random. The general consensus is that they were influenced by existing explorer routes, colonial railways and climatic conditions, specifically with lower disease burden and closer to the coast (Nunn et al., 2014, Michalopoulos and Papaioannou, 2018). However, there is no evidence that the motivations behind the locations of Christian missions, at least within a country, differed by type of missionary. The Century Company map provides information on the locations of explorer routes up until 1895 and colonial railways as of 1897 (Nunn et al., 2014)¹¹. As missionary locations tended to follow explorer routes and existing railways, the Century Company map allows for controls for these factors. In addition, following Nunn et al. (2014) I use data from the FAO to take into account geographic and climatic

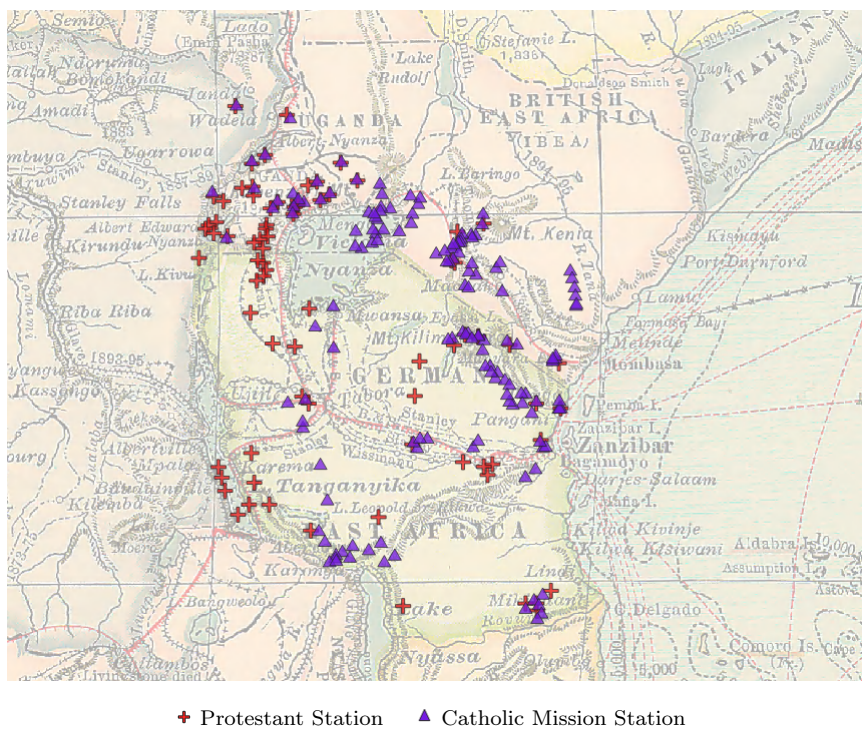
¹⁰This implies that the map does not include missionary-type activity that was conducted by Africans for Africans (Michalopoulos and Papaioannou, 2018). In addition, it does not include foreign missionary locations that catered to (white) immigrant and other foreign populations.

¹¹Digitized versions of the Nunn et al. (2014) map and the Century Company Atlas are very generously available via Nathan Nunn's website (<https://scholar.harvard.edu/nunn/pages/data-0>).

conditions. The Global Agro-Ecological Zones (GAEZ) provide data in 5x5 km grid cells on the ecological suitability for crop cultivation, elevation, and access to fresh water. It is worth noting that the FAO GAEZ data is used to control for the suitability of locations for cultivation and does not reflect land usage patterns.

Figure 1.4 below shows the locations of Protestant missionaries (purple triangles) and Catholic missionaries in (red crosses) in East Africa (present day Kenya, Tanzania, and Uganda) on the Century Map.

Figure 1.4: Locations of Protestant and Catholic mission stations in Kenya, Tanzania, Uganda (based on Roome, 1924)



Survey Data: The main source of survey data used in this paper come from four rounds of the Demographic and Health Survey (DHS) - from

rounds 4 to 7 (2000-2016) - across Kenya, Tanzania and Uganda.¹² ,
¹³ All of the DHS surveys provide data on individual education and employment, while the more recent rounds have data on gender attitudes within the household. The DHS is focused on surveying women who make up at least 70% of the sample. I also use data from round 6 of the Afrobarometer from the same set of countries - Kenya, Tanzania, and Uganda - to look at public sector employment and attitudes towards female political leaders.

Civil Service Data: In addition to survey data, I use data from the Tanzanian civil service. The World Bank Bureaucracy Lab provided the staff lists of the Tanzanian public sector. The raw employment data comprises approximately 520,000 individual employees and it is matched to the WIPO name-gender database to match genders to employee names. The matching is successful for over 85% of the names and then it is aggregated to the organisational level to compute the share of female employees. I focus on employment at the local government authority (LGA) level and in addition to calculating the share of female employees at the LGA level, I use job titles to separately calculate the female share of civil servants (those working in the administration) and front-line workers (doctors, teachers, etc.). Furthermore, I also use this data to see if the administrative leadership, namely the District Executive Director, is a woman.

¹²There are different accompanying surveys that are carried out in the years in-between DHS surveys but all the data used in this paper comes from the full DHS surveys.

¹³For Kenya, I use DHS rounds 4, 5,7; for Tanzania - 4, 6, 7; for Uganda - 4, 5, 6, 7. The difference in the rounds used comes only from when the DHS included the country in the full DHS survey.

1.4 Estimation and Results

1.4.1 Education

I use an estimation strategy that is similar to that of Nunn et al. (2014) where a respondent is considered to be exposed to missionary activity if there is a mission station (Protestant or Catholic) within a 25km radius of her location.¹⁴ This 25km radius serves as a proxy for the respondent's village. The estimating equation can be written as:

$$y_i = \alpha_c + \beta D_{v(i)} + \phi D_{v(i)} \times female_i + \Gamma X_i + \Lambda X_{v(i)} + \Theta X_{m(i)} + \omega_r + \epsilon_i, \quad (1.1)$$

where y_i represents a series of measures of an individual's education. $D_{v(i)}$ is a dummy variable that equals one if there is a mission station, irrespective of type, located within 25km of the respondent's location. Thus, β captures the average total effect of missionary activity on individuals whereas ϕ measures the additional effect of missionary activity on female respondents. Nunn et al. (2014) provide evidence that Protestant missionary activity in particular has a strong and persistent effect on female education, and so I explore this within the East African context and estimate the following equation:

$$y_i = \alpha_c + \beta_m D_{v(i)} + \beta_{Cath} D_{v(i)}^{Cath} + \beta_{Both} D_{v(i)}^{Both} + \Gamma X_i + \Lambda X_{v(i)} + \Theta X_{m(i)} + \omega_r + \epsilon_i, \quad (1.2)$$

where $D_{v(i)}$, $D_{v(i)}^{Cath}$, $D_{v(i)}^{Both}$ are three different dummy variables that capture different levels of missionary activity within a 25km radius of a respondent's location. While $D_{v(i)}$ is still a dummy variable that equals one if there is a mission station, irrespective of type, $D_{v(i)}^{Cath}$ is a dummy variable that equals one if there is *only* a Catholic mission station and $D_{v(i)}^{Both}$ is a dummy variable that equals one if there is *both* a Catholic and

¹⁴For results that measure exposure to missionary activity as the distance between the respondent and the mission station, see Section 1.C

a Protestant mission station. This means that although the first two variables equal one if there is at least one mission station, the latter equals one if there are at least two mission stations. Their corresponding coefficients show the differential effect of Protestant and Catholic missionaries in villages that have only one or the other, as well as the effects in villages that have both types. Thus, β_m captures the effect of missionary activity on the outcome variable and β_{Cath} captures the differential effect of Catholic missionary activity relative to Protestant missionary activity. Finally, β_{Both} estimates the effect of missionary activity in villages that have both Catholic and Protestant missionary activity.

In both Equation 1.1 and Equation 1.2, X_i represents a vector of individual-specific controls, namely age, whereas $X_{v(i)}$ are village level controls, mainly related to the ecological and environmental conditions. The vector $X_{m(i)}$ represents a vector of measures of topography and crop suitability of the area surrounding the closest mission location.¹⁵ It also includes dummy variables which indicate whether the closest mission was either along a colonial explorer route and/or railway line. The consensus is that missions located themselves in areas that had a more moderate climate and easy access to fresh water. Finally, α_c and ω_r are country and DHS round fixed effects, respectively.

Figure 1.5 shows the locations of respondents in round 4 of the DHS alongside the locations of mission stations.

¹⁵This is calculated from the average of these variables in a 25km radius around the mission location. The variables included are elevation, proximity to fresh water, suitability for cultivating cereals, corn, and rice. The 25km radius and the list of variables follow Nunn et al. (2014)

Figure 1.5: Locations of round 4 DHS respondents, Protestant mission stations and Catholic mission stations in Kenya, Tanzania, Uganda (based on Roome, 1924)

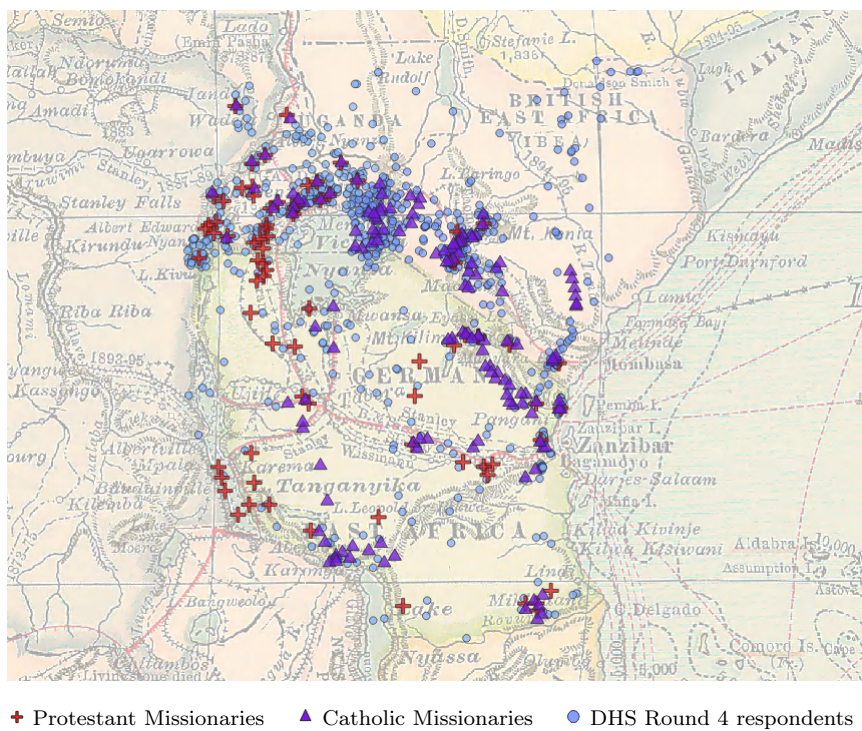
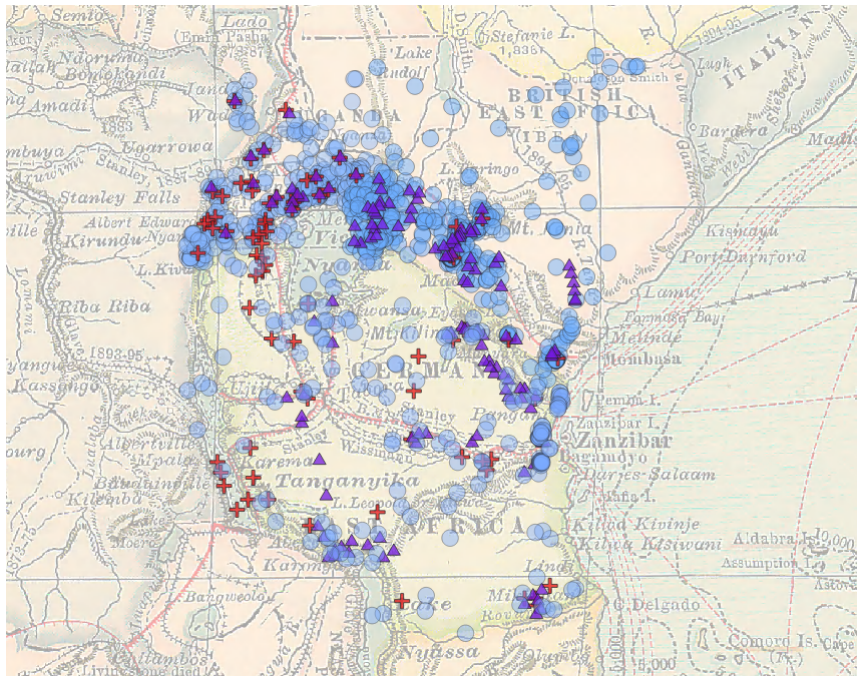


Figure 1.6 below illustrates the locations of respondents to DHS round 4 with a circle of radius 25km drawn around them along with the locations of mission stations.

Figure 1.6: Locations of round 4 DHS respondents with a 25km radius circle drawn around them, Protestant mission stations and Catholic mission stations in Kenya, Tanzania, Uganda (based on Roome, 1924)



✚ Protestant Missionaries ▲ Catholic Missionaries ● Villages of DHS Round 4 respondents

The effects of missionary activity on education are shown in Table 1.1. Column (1) shows the combined effect of missionaries on years of schooling as well as the differential effect of missionary activity on women. Column (2) restricts the sample to women only and we can see that women living close to mission stations had nearly 1.5 additional years of schooling compared to those without missionary activity. Column (3) shows the differential effects of Protestant and Catholic missionaries on women's education. In villages with only Protestant missionary activity, women had nearly 1 additional year of schooling compared to villages without missionary activity and approximately 0.36 additional years of schooling compared to villages with only Catholic missionary activity. Similarly, in villages with Protestant missionary activity only, women are

10 percentage points (18.5%) more likely to finish primary school compared to villages without missionary activity and 4 percentage points (7.5%) compared to villages with only Catholic missionary activity (see column (6)). These differential effects seem to be mainly driven by rural areas where it is more likely that missionaries provided the first and main source of education (see Section 1.D.1).

When it comes to the likelihood of women completing secondary school, I do not find a significant difference between the effects of Catholic and Protestant missionary activity (see column (9)). Interestingly, across all three measures of schooling, women benefit the most when there are both Catholic and Protestant mission stations (see the bottom row of columns (3), (6), (9)). On the one hand, the large magnitude of this coefficient (Missionary X (Catholic & Protestant)) is in part mechanical since it requires that a village has at least two missions. On the other hand, however, it is evidence of the positive effect of competition between Catholic and Protestant missionaries first shown by Gallego and Woodberry (2010).

Table 1.1: *The impact of the historical presence of missionaries (Catholic and Protestant) on education*

	Education (years)			Completed Primary School			Completed Secondary School		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Mission	Full Sample 0.945*** (0.079)	Women 1.452*** (0.071)	Women 0.938*** (0.091)	Full Sample 0.090*** (0.009)	Women 0.151*** (0.008)	Women 0.103*** (0.010)	Full Sample -0.038*** (0.005)	Women 0.080*** (0.006)	Women 0.042*** (0.008)
Female X Mission	0.569*** (0.062)			0.066*** (0.007)			0.130*** (0.008)		
Mission X Catholic only			-0.356** (0.166)			-0.043** (0.017)			-0.009 (0.012)
Mission X (Catholic & Protestant)			1.294*** (0.106)			0.123*** (0.011)			0.091*** (0.010)
No. of Observations	130621	97100	97100	131013	97332	97332	131013	97332	97332
No. of Clusters	5164	5162	5162	5164	5162	5162	5164	5162	5162
R-squared	0.232	0.249	0.262	0.156	0.175	0.184	0.617	0.132	0.139
Mean Dependent Variable	6.786	6.474	6.474	0.567	0.540	0.540	0.368	0.149	0.149

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Clustered standard errors are reported in parentheses with clustering done at the village (enumeration area) level. The sample is restricted to all individuals (or only women where indicated) surveyed in the DHS over the age of 18. The outcome variables are indicated in the columns where "Education (years)" is years of schooling, "Completed Primary School" is a dummy indicating if an individual completed primary school, and "Completed Secondary School" is a dummy indicating if an individual completed secondary school. The missionary variables capture the proximity to a historical mission location - they are dummies that equal 1 if a mission station is within 25km from a respondent's location. All columns contain controls for the ecological characteristics in the surrounding village - elevation, the length of the growing season, rainfall and the average annual diurnal temperature range. Controls are also included for the area surrounding the mission locations from the FAO-GAEZ maps. These are suitability for cultivation of rice, wheat, and corn, elevation, access to fresh water and proximity to an explorer route and colonial railway line as marked on the Century Atlas. Individual controls are for age. Fixed effects for the country and the DHS round are also included in all specifications. P-values for testing the difference between the coefficients of the distance to the closest Protestant mission and distance to the Catholic mission are reported where appropriate.

The larger effects of Protestant missionary activity as compared to Catholic missionary activity on women's education are in line with the existing research on missionary activity in Africa (Cagé and Rueda, 2016, Nunn et al., 2014, Gallego and Woodberry, 2010) and constitute the first step in exploring its effects on female employment. While the 25km radius is somewhat arbitrary, it follows Nunn et al. (2014) and Section 1.C presents results with a more flexible estimation strategy where exposure to missionary activity is calculated as (log of) distance to the closest mission station. The effects are similar to those presented here, however, in the continuous distance estimation strategy, I am unable to disentangle the effects when respondents are exposed to both types of missionaries.

1.4.2 Female Empowerment in the Household

It has been established that there exists a relationship between religion and attitudes towards gender equality and roles (Guiso et al., 2003, Giuliano, 2017). However, the role of missionary activity during the colonial period has not been as clear, especially in the East African context. Calvi et al. (2020) present evidence of the positive effect of Protestant missionary activity on gender parity in India and the analysis in Nunn et al. (2014) hints at the possibility that Protestant missions had a positive effect on attitudes towards gender equality.¹⁶ In this subsection, I estimate the effect of different types of missionaries on measures of gender equality that are mainly focused on the position of women within the household.

I use the same estimation strategy as shown above in Equation 1.1 and Equation 1.2 where y_i represents outcome variables which measure gender equity. As in Section 1.4.1, I start by estimating the combined average effect of missionary activity on the outcome variables and then analyse the differential effects of Protestant and Catholic missionaries. The remaining control variables are the same as the earlier estimation.

¹⁶The results on this in Nunn et al. (2014) are not very consistent and therefore are not presented as convincing evidence.

Since the majority of the outcome variables in this subsection are based on questions in the DHS that are only asked to women, the sample is restricted to include only women.

For ease of interpretation, the outcome variables in Table 1.2 have been re-scaled so that more positive numbers indicate more equitable (or pro-female) gender attitudes.¹⁷ The results are shown in the table below.

¹⁷This re-scaling affects only the first two outcome variables - "Age Difference" and "Domestic Violence" - so that more positive numbers indicate spouses being closer in age and being less accepting of domestic violence.

Table 1.2: *The impact of the historical presence of missionaries (Catholic and Protestant) on measures of female empowerment*

	Age Difference		Domestic violence		Say in Large Exp.		Say in Daily Exp.		Say in Woman's Salary	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Mission	0.209*** (0.064)	0.150* (0.090)	0.098*** (0.008)	0.076*** (0.011)	0.006 (0.008)	0.037*** (0.010)	-0.003 (0.013)	0.034** (0.016)	0.009** (0.004)	0.017*** (0.006)
Mission X Catholic only		-0.072 (0.129)		-0.038** (0.016)		-0.020 (0.017)		-0.035 (0.027)		-0.013 (0.008)
Mission X (Catholic & Protestant)		0.158 (0.103)		0.061*** (0.012)		-0.059*** (0.012)		-0.066*** (0.018)		-0.011* (0.006)
No. of Observations	54113	54113	79835	79835	59844	59844	21837	21837	41439	41439
No. of Clusters	4992	4992	4999	4999	4993	4993	1362	1362	3910	3910
R-squared	0.013	0.013	0.067	0.070	0.102	0.104	0.153	0.155	0.007	0.007
Mean Dependent Variable	-6.452	-6.452	0.445	0.445	0.541	0.541	0.609	0.609	0.074	0.074

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Clustered standard errors are reported in parentheses with clustering done at the village (enumeration area) level. In columns (1)-(10) the sample includes all women surveyed in the DHS over the age of 18. Columns (1)-(10) contain controls for the ecological characteristics in the surrounding village - elevation, the length of the growing season, rainfall and the average annual diurnal temperature range. The outcome variables have all been re-scaled so that positive coefficients indicate greater gender equality - "Age Difference" is the age difference between spouses; "Domestic Violence" is a dummy that equals 1 if the respondent says domestic violence is not justified; "Say in Large Exp." equals 1 if the respondent has a say in large household expenses; "Say in Daily Exp." equals 1 if the respondent has a say in daily expenses; "Say in Women's Salary" equals 1 if the respondent has a say in spending money from her salary. The missionary variables are dummies that equal 1 if a mission station is within 25km radius of the respondents' location. All columns include controls for the area surrounding the mission locations from the FAO-GAEZ maps. These are suitability for cultivation of rice, wheat, and corn, elevation, access to fresh water and proximity to an explorer route and colonial railway line as marked on the Century Atlas. Individual controls are for age. Fixed effects for the country and the DHS round are also included in all specifications.

In columns (1)-(2) we can see that women living in areas where missionaries were active are closer in age to their husbands which is a measure of greater gender equality in a marriage. The effects are strongest where there is only Protestant missionary activity and although the differential effect of Catholic missionaries is negative, it is not statistically significant. Column (3)-(4) show that in villages that had only Protestant missionary activity respondents were less accepting of domestic violence compared to villages with only Catholic missionary activity. The coefficient is negative and statistically significant, indicating that in areas with only Catholic missionary activity, respondents were 3.8 percentage points more likely to accept domestic violence compared to areas with Protestant missionary activity. The differences between the effects of Protestant and Catholic missions are weaker and more suggestive in the estimates on outcomes that measure women's say in household finances. Columns (5)-(8) suggest that in villages exposed to Protestant missions only, rather than Catholic missions, women were marginally more likely to have a say in both large household expenses and daily expenses. The relatively large coefficient on having both types of missionaries is in part mechanical as these villages have at least two mission stations versus having just one. Nonetheless, the negative coefficient points to Protestant missionary activity not having a large impact on these outcomes. Columns (9) and (10), on the other hand, show that villages with only Protestant missionary activity had a significant effect on women having a say in what happens to their own salary. Summing the coefficients in rows one and three of column (10), we see that Protestant missionary activity is associated with a 0.6 percentage point (approximately 8%) increase in women having a say in what happens with their own salary. Across all columns in Table 1.2, the coefficient on Catholic missionary activity is consistently negative, however, the estimate is somewhat imprecise and therefore is more suggestive rather than definitive evidence.

The shaping of attitudes is likely to be a long-term process and in order to dig somewhat deeper into the effects of missionary activity on these measures of female empowerment in the household, I re-do the same

analyses separately for urban and rural areas. The reason for exploring this margin for differential effects is that rural areas are arguably less diverse and more insular with missionaries providing the main source of external influence. Therefore, they would potentially have a larger contemporary effect of historical missionary activity. I find evidence that is in line with this wherein the relationship between Protestant missionary activity and female empowerment within the household is stronger in rural areas than urban areas (see Section 1.D.1 and Section 1.D.2). This differential effect gives some additional confidence to the evidence presented in this subsection.

1.4.3 Employment

Education alongside more equitable gender attitudes are some of the main drivers of female labour-force participation. The results so far show that Protestant missionaries in particular had a larger positive impact on the quantity of education for women, and a somewhat more positive effect on attitudes and behaviours indicating greater gender equality. Furthermore, historically, Protestant mission stations provided women with some of the first employment opportunities in Uganda Meier zu Selhausen (2014). Given these factors, I explore the differential effects of Protestant and Catholic missionary activity on women's labour-force participation in this sub-section.

The estimation strategy is the same as that used in Equation 1.2 where respondents who have a mission location within 25km of their location are considered to have been exposed to missionary activity. I consider three different outcomes related to employment. The first is a dummy that equals one if an individual reports having been employed full-time in the past year. The second outcome indicates if an individual reports that her broad category of employment is not in agriculture and is not unskilled labour. Finally, the third outcome equals 1 if an individual reports that she was paid cash wages in her employment. The reasoning behind these measures of employment is that they are the closest to

capturing participation in the formal labour-force using this survey data.

The results are presented in Table 1.3.

Table 1.3: *The impact of the historical presence of missionaries (Catholic and Protestant) on employment*

	Employed (full-time)			Employed (non-agricultural, skilled)			Employed (cash)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Full Sample	Women	Women	Full Sample	Women	Women	Full Sample	Women	Women
Mission	0.068*** (0.011)	0.088*** (0.009)	0.086*** (0.014)	0.156*** (0.011)	0.125*** (0.009)	0.100*** (0.012)	0.120*** (0.011)	0.133*** (0.011)	0.100*** (0.016)
Female X Mission	0.023** (0.011)			-0.035*** (0.009)			0.016 (0.011)		
Mission X Catholic only			-0.045** (0.020)			-0.047** (0.020)			-0.046** (0.023)
Mission X (Catholic & Protestant)			0.025* (0.014)			0.072*** (0.013)			0.090*** (0.016)
No. of Observations	85935	60399	60399	116704	83198	83198	90304	61801	61801
No. of Clusters	5148	5055	5055	5164	5162	5162	4996	4901	4901
R-squared	0.143	0.137	0.139	0.147	0.106	0.110	0.158	0.130	0.136
Mean Dependent Variable	0.605	0.584	0.584	0.391	0.349	0.349	0.539	0.489	0.489

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Clustered standard errors are reported in parentheses with clustering done at the village (enumeration area) level. The sample includes all individuals (or only women where indicated) surveyed in the DHS over the age of 18. The outcome variables are indicated over the columns where "Employed" equals 1 if a respondent is employed full-time; "Employed (non-agricultural, skilled)" equals 1 if a respondent is employed outside of agriculture and not in unskilled work. The missionary variables are dummies that equal 1 if a mission station is within 25km radius of the respondents' location. All columns contain controls for the ecological characteristics in the surrounding village - elevation, the length of the growing season, rainfall and the average annual diurnal temperature range. Controls are also included for the area surrounding the mission locations from the FAO-GAEZ maps. These are suitability for cultivation of rice, wheat, and corn, elevation, access to fresh water and proximity to an explorer route and colonial railway line as marked on the Century Atlas. Individual controls are for age. Fixed effects for the country and the DHS round are also included in all specifications.

Starting from columns (1)-(3), the overall effect of missionary activity on female employment is positive and significant. However, looking at Protestant and Catholic missionary activity separately (see column (3)), I estimate that women living in areas Protestant missionary activity only are about 8.6 percentage points (15%) more likely to be employed full-time. In comparison, in villages with Catholic missionary activity, this likelihood is reduced by a little less than half and the estimated coefficient on Catholic only missionary activity is 4.1 percentage points. Next, in columns (4)-(6), I look at women who report being employed in non-agricultural and skilled work. I find that women in villages with Protestant missionary activity only are 10 percentage points (approximately 28.5%) more likely to be engaged in these forms of employment (see column (6)). Once again, this likelihood is reduced by nearly 50% in villages with Catholic missionary activity only (5.3 percentage points). Finally, in columns (7)-(9), I estimate the relationship between missionary activity and the likelihood that a woman is employed for cash wages. The overall pattern persists wherein missionary activity is associated with a higher likelihood that a woman is employed for cash wages (column (8)) but villages with Protestant missionary activity only account for much of this increase. Villages with Protestant missionary activity only have 10 percentage points (20%) higher share of women who earn cash wages. In villages with Catholic missionary activity only, this likelihood decreases by 4.6 percentage points (11%). Across all three measures of employment, I find a strong positive effect of Protestant missionary activity on women that is consistently larger and different from the effect of Catholic missionary activity. As in Section 1.4.1, the estimated relationship is stronger in rural areas (see Section 1.D.1).

Consistent with the effects of missionary activity on education, villages with both types of missionaries have an even larger associated increase in these measures of female employment. This can be seen in the coefficient of the variable "Mission X (Catholic & Protestant)" in Table 1.3. Again, this effect is partly mechanical since these villages must have had at least *two* mission stations - one Catholic and one Protestant

- in order to capture this effect while the other coefficients are estimated using villages that had at least *one* mission station. At the same time, this larger effect could be the result of missionaries competing with one another and thereby providing better education and/or employment opportunities. This would be in line with Gallego and Woodberry (2010) who have shown that in locations where missionaries had to compete, Catholic and Protestant missionaries had similarly positive effects on education.

Finally, using survey data from round 6 of the Afrobarometer, I estimate the effects of missionary activity on public sector employment. As discussed in Section 1.2, the public sector makes up a substantial share of the formal employment sector - in Tanzania approximately 44% of formally employed labour works in the public sector. The Afrobarometer asks respondents for their sector of employment so I am able to use this to explore the effects of Protestant missionary activity on female employment in the formal sector. The estimation is the same as in Equation 1.2 and the results are shown in Table 1.4

Table 1.4: *The impact of missionary activity on self-reported public sector employment*

	Full Sample	Women	
	(1)	(2)	(3)
Mission	0.016 (0.011)	0.022** (0.010)	0.027 (0.017)
Female X Mission	0.005 (0.013)		
Mission X Catholic only		-0.032* (0.019)	
Mission X (Catholic & Protestant)			0.002 (0.019)
No. of Observations	5784	2851	2851
No. of Clusters	896	888	888
R-squared	0.018	0.026	0.027
Mean Dependent Variable	0.051	0.042	0.042

***, **, *, indicates significance at the 1%, 5%, and 10% levels respectively. Standard errors are clustered at the level of the primary sampling unit of the Afrobarometer. The outcome variables is a dummy that equals 1 if a respondent is employed by the government. The missionary variables are dummies that equal 1 if a mission station is within 25km radius of the respondents' location. Controls are also included for the area surrounding the mission locations from the FAO-GAEZ maps. These are suitability for cultivation of rice, wheat, and corn, elevation, access to fresh water and proximity to an explorer route and colonial railway line as marked on the Century Atlas. Individual controls are for age. P-values for testing the difference between the coefficients of the distance to the closest Protestant mission and distance to the Catholic mission are reported where appropriate.

Similar to the previous results, I find that Protestant missionary activity has a mildly positive effect on the likelihood that a woman reports being employed in the public sector, while the coefficient on Catholic missionary activity has the opposite effect. Although these results are mainly suggestive rather than conclusive, they are in line with an interesting pattern that Protestant missionary activity has had a larger positive effect on formal female employment. Furthermore, to address any potential concerns that the results are driven by areas that are either very close to or very far away from mission stations which may not be comparable to areas with missionary activity, in Section 1.B I restrict the sample to respondents who live between 5 and 100km from a mission

station. The results remain very similar.

Potential Channels between Employment, Education and Empowerment

The evidence presented thus far highlights the positive association between Protestant missionary activity, female education, empowerment within the household and employment. However, the question of how this relationship between Protestant missionary activity and women's employment may be attributed to education or greater female empowerment or some combination of the two remains. In the appendix in Section 1.A and Section 1.E, I present results from estimations that perhaps shed some light on this.

First, in Section 1.A, I estimate the relationship between the same employment variables as used above and education, as measured by years of schooling, and the female empowerment measures. The coefficient on education and the majority of the measures of female empowerment are positive and statistically significant. Furthermore, the estimated relationship between education and employment remains largely unchanged when the empowerment measures are added to the regression. Next, in Section 1.E, I estimate a positive correlation between the residuals from regressing the same measures of employment on education and the measures of female empowerment. While all of these estimates are merely correlations, they suggest that both education and empowerment play concurrent but potentially separate roles in affecting female employment.

At the same time, the consistency of the association between Protestant missionary activity and women's employment and Protestant missionary activity and women's education suggests that education may be the main channel through which Protestant missionary activity has impacted women's employment. This can be seen in the large positive coefficient estimated in villages with both types of missionary activity when education and employment are outcome variables and is mirrored in the negative coefficient of the same when female empowerment mea-

sures are the outcome variables. Moreover, this finding is in some ways aligned with Guarnieri and Rainer (2021) who document that in a somewhat similar context, women's increased employment is associated with higher education levels but comes at the cost of higher incidence of domestic violence in former British Cameroon. Given that in my context I do not find any evidence of increased domestic violence, rather the evidence of the opposite, supports the possibility that there is a positive relationship between empowerment and labour-force participation. However, when weighing the relative importance of these two channels, namely, education or female empowerment, the former is the more important driver of female employment.

The focus on education in terms of quantity thus far has been mainly due to the fact that I am unable to tease apart potential differences in the quality and type of education provided by Protestant and Catholic missionaries. This might be particularly relevant when it comes to the education of women and girls. There remains the possibility that schools run by Protestant missions provided higher quality or more gender equal education. This would be plausible given the emphasis that Martin Luther put on the importance of teaching girls how to read (Becker and Woessmann, 2008) compared to the more general missionary objective of educating girls to simply be Christian wives and home-makers (Labode, 2021). If Protestant missionaries did provide higher quality education, it would present a potential alternative channel through which Protestant missionary activity might affect female employment through both education and empowerment which would not be captured in the estimates of education measured by years of schooling. Although I am unable to present any definitive evidence in support of or against this channel, I believe it is worth keeping in mind as a possible alternative manner through which Protestant missionary activity continues to have a positive associated effect with female employment through education and empowerment simultaneously.

1.4.4 Tanzanian Civil Service

While survey data enabled me to estimate the effect of missionary activity on female employment at an individual level, I use data from the Tanzanian civil service to estimate the effects of missionary activity on the share of female employees in Local Government Authority offices across mainland Tanzania. For this analysis, I use the following equation:

$$y_{lga} = \alpha + \beta_p M_{lga}^j + \Theta X_{lga} + \epsilon_{lga}. \quad (1.3)$$

The outcome variable, y_{lga} , is the computed share of female employees in a given Local Government Authority (LGA) according to the Tanzanian Government - President's Office for Public Sector Management's staff list. LGAs are the lowest form of public administration. The share of female employees at the LGA level is estimated using the official staff list to identify female employees and then, the data is collapsed to an LGA level to get the share of female employees, the share of female civil servants and the share of female front-line workers at an LGA level.

The treatment is the number of Protestant and Catholic missionaries (both together and separately) in a given LGA.¹⁸ The regressions also include similar geographic controls to those in the previous analysis - average elevation, crop producing area and proximity to fresh water. Additional controls are added for the size of LGA both in terms of area and population, if the LGA is classified as urban, and the total number of employees in the LGA. The control variables are represented in the equations above as X_{lga} . The results are shown in Table 1.5.

¹⁸In cases where the boundaries have changed after 2012, this is usually when new LGAs were carved out of older ones, I use the treatment for the older bigger LGA for both old and new districts. In cases where district changes occurred, these were checked on each LGA website and the matching done manually. There are a small number of cases where I was unable to ascertain when and where an LGA was created, and as such these have been excluded from this part of the analysis, but they would be covered in the earlier part which uses data from the Afrobarometer.

Table 1.5: *The impact of missionary activity on the share of female public sector employees at a Local Government Authority (LGA) level in Tanzania*

	All Employees				Civil Servants	Frontline Workers
	(1)	(2)	(3)	(4)	(5)	(6)
Missionary (Total)	0.008** (0.004)					
Protestant Missionary		0.011** (0.004)	0.011** (0.005)	0.011** (0.005)	0.014** (0.006)	0.007* (0.004)
Catholic Missionary		0.004 (0.008)	0.004 (0.009)	0.004 (0.009)	0.011 (0.008)	0.001 (0.008)
No. of Observations	169	169	159	159	159	159
R-squared	0.725	0.727	0.735	0.735	0.513	0.727
Female Share - Average	0.484	0.484	0.480	0.480	0.444	0.420
Population			✓	✓	✓	✓
Pay Grades				✓		

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Standard errors are clustered at the LGA level. Treatment is the number of the Protestant and Catholic missionary locations in an LGA. In columns (1)-(4) the dependent variable is the share of female employees at an organizational (LGA) level, while columns (5)-(6) looks at the female share of civil servants and front-line workers respectively. Geographic controls are from GAEZ and are estimates of the agricultural productivity potential of the area, average elevation and average availability of fresh water as well as whether a historical explorer route or railway (based on The Century Company Map) passed through the LGA. Additional controls are included where indicated for if an LGA is an urban LGA, the size in terms of area of an LGA, population of the LGA as well as the share of staff at each pay grade.

The results from the Tanzanian civil service analysis show that LGAs which had Protestant missionary activity also have a higher share of female employees and the results remain relatively stable. The estimates indicate that the doubling of Protestant missionary activity (as measured by the number of Protestant mission locations) in an LGA corresponds to a 1.1 percentage points increase in the share of female employees. Given that the baseline employment of women in the Tanzanian civil service is estimated at 48%, the effect of Protestant missionary activity corresponds to an approximately 2.5% increase in the female share of employees, making the gender ratio in the organisation almost exactly equal. Furthermore, when splitting the employees into civil servants and front-line workers, the effects seem to be driven by an increase in female civil servants rather than front-line workers and the estimate increases slightly in magnitude.

Public sector employment is one of the major sources of formal em-

ployment in developing countries and thus, the positive effects of Protestant missionary activity on female public sector employment also speak to the broader topic of female labour-force participation. Moreover, given that public sector employment not only has high job security (Finan et al., 2017) but also has higher wages (Figure 1.2), a more equitable gender-wage distribution and includes a number of other benefits such as health insurance, maternity leave, and a pension, it is a very attractive employer. Therefore, being employed in the public sector is a valuable career path, especially for women, as their share of employment in the formal private sector tends to be very limited in this context.

Next, I study how missionary activity affects the likelihood that an LGA has a female administrative head, namely District Executive Directors. The estimating equations are the same as Equation 1.3 above where y_{lga} is a dummy that indicates if the District Executive Director for the LGA is a woman. DEDs are the highest ranking civil servants at an LGA level and are responsible for all final decisions. The treatment is the number of Protestant and Catholic missionaries in a given LGA and the geographic controls, as well as controls for size in terms of both area and population, are included as indicated. The results are presented in Table 1.6.

Table 1.6: *The effect of missionary activity on the likelihood of having a female District Executive Director (DED)*

	Female DED			
	(1)	(2)	(3)	(4)
Missionary (Total)	0.034 (0.035)			
Protestant Missionary		0.100** (0.047)	0.099** (0.048)	0.099** (0.048)
Catholic Missionary		-0.081* (0.044)	-0.068 (0.044)	-0.068 (0.044)
No. of Observations	169	169	159	159
R-squared	0.069	0.105	0.152	0.152
Sh. of Female DEDs	0.166	0.166	0.164	0.208
Population			✓	✓
Pay Grades				✓

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Standard errors are robust (clustered at organization level). The outcome variable is a dummy variable that takes value 1 if an LGA has a female District Executive Director. Treatment is the number of the Protestant and Catholic missionary locations in an LGA. Control variables are included as indicated in the table including the number of employees and the share of employees at each pay grade level as classified according to the Tanzanian Civil Service pay schedule. Geographic controls are from GAEZ and are estimates of the agricultural productivity potential of the area. Other controls include whether a historical explorer route or railway (based on The Century Company Map) passed through the LGA, if an LGA is an urban LGA, the area in the LGA, the share of that area that is classified as urban within the LGA as well as controls for LGA population and the number of employees.

The results show that LGAs with at least one Protestant mission location have a higher likelihood of having a female DED. The increase corresponds to nearly 10 percentage points. Given that the baseline share of LGAs with a female DED is about 20%, this estimated increase is very large and it should be interpreted with some caution. DEDs are centrally appointed and therefore are more likely to move for their jobs. This implies that the estimated coefficient may not necessarily only capture the positive effect of Protestant missionary activity on the supply of

qualified women through higher levels of schooling, more equitable gender norms and higher levels of female employment. The coefficient may also be capturing the fact that these areas may be more hospitable to women leaders as seen in the estimates on attitudes towards women having equal chance of being in political office in Table 1.2. As both these channels may be playing a role and would go in the same direction, I am unable to separate or disentangle these effects but rather think that if both are at play, this may cause an amplifying effect of Protestant missionary activity on the likelihood that an LGA has a female DED.

1.5 Conclusion

The influence of missionaries, from the early 20th century, on individual education persists even today (Nunn et al., 2014, Woodberry and Shah, 2004, Gallego and Woodberry, 2010, Cagé and Rueda, 2016). Using survey data from East Africa, I find that Protestant missionary activity, compared to Catholic missionary activity, had a larger positive effect on women's and girls' education. Similarly, I also find that Protestant missionary activity, in particular, is positively associated with measures of greater female empowerment in the household including attitudes towards domestic violence and the likelihood that women have a say in household financial decisions.

Next, I estimate that Protestant missionary activity is related to an increase in the likelihood that women are employed full time and in non-agricultural skilled employment, earn cash wages and in particular in the public sector. These effects are consistently larger than the effects of Catholic missionary activity. Taking these results together suggests that Protestant missionary activity may exercise its effects on female employment through the stimulus of education as well as through its associated effect on the social attitudes towards women's position in society.

With additional data from the Tanzanian Civil Service staff list, I analyse the effect of Protestant missionary activity on gender composi-

tion at an organizational level. I estimate that districts or Local Government Authorities (LGAs) with Protestant missionary activity have a higher share of female employees. Moreover, when separating out civil servants from front-line service providers, I find that the effects are somewhat stronger for the civil servants. Finally, I explore the effect of historical missionary activity on the likelihood that an LGA has a woman manager (District Executive Director) and find that Protestant missionary activity increases this likelihood substantially.

The results presented in this chapter aim to add to the literature on the long-term effects of Protestant missionary activity on female education, empowerment and employment, and, at the same time, contribute to the research done on the public sector.

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Appendices

1.A Employment, Education, and Empowerment within the Household

Table A1: Estimating the relationships between employment, education and female empowerment within the household

	Employed (full-time)			Employed (non-agricultural, skilled)			Employed (paid cash wages)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Education (years)	0.021*** (0.001)		0.015*** (0.002)	0.033*** (0.001)		0.032*** (0.002)	0.030*** (0.001)		0.028*** (0.002)
Age difference		0.003* (0.001)	0.002 (0.001)		0.003** (0.001)	0.001 (0.001)		0.001 (0.001)	-0.000 (0.001)
Domestic violence is okay		0.093*** (0.018)	0.071*** (0.018)		0.089*** (0.014)	0.042*** (0.013)		0.111*** (0.016)	0.068*** (0.015)
Say in large exp.		-0.002 (0.018)	-0.006 (0.018)		0.064*** (0.014)	0.052*** (0.013)		0.030 (0.018)	0.021 (0.017)
Say in daily exp.		-0.016 (0.020)	-0.021 (0.020)		0.094*** (0.013)	0.078*** (0.013)		0.046*** (0.018)	0.038** (0.017)
Say in salary		-0.032 (0.031)	-0.026 (0.030)		0.014 (0.031)	0.032 (0.030)		0.016 (0.031)	0.028 (0.030)
No. of Observations	60222	6655	6601	82971	8959	8885	61620	6968	6914
No. of Clusters	5055	706	702	5162	718	717	4901	707	703
R-squared	0.127	0.099	0.109	0.144	0.113	0.172	0.143	0.233	0.271
Mean Dependent Variable	0.583	0.558	0.555	0.348	0.279	0.275	0.488	0.375	0.371

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Clustered standard errors are reported in parentheses with clustering done at the village (enumeration area) level. The sample includes all individuals (or only women where indicated) surveyed in the DHS over the age of 18. The outcome variables are indicated over the columns where "Employed" equals 1 if a respondent is employed full-time; "Employed (non-agricultural, skilled)" equals 1 if a respondent is employed outside of agriculture and not in unskilled work. The variable "Education (years)" measures years of schooling. The variables measuring gender attitudes are - "Age Difference" is the age difference between spouses; "Domestic Violence" is a dummy that equals 1 if the respondent says domestic violence is not justified; "Say in Large Exp." equals 1 if the respondent has a say in large household expenses; "Say in Daily Exp." equals 1 if the respondent has a say in daily expenses; "Say in Women's Salary" equals 1 if the respondent has a say in spending money from her salary; All columns contain controls for the ecological characteristics in the surrounding village - elevation, the length of the growing season, rainfall and the average annual diurnal temperature range. Individual controls are for age. Fixed effects for the country and the DHS round are also included in all specifications.

1.B Restricted Sample to Individuals living from 5km to 100 km from Mission Locations

In this section I present estimates of missionary activity on education, empowerment and employment when the sample is restricted to respondents who live at least 5km and at most 100km away from a mission station.

Table A2: *The impact of the historical presence of missionaries (Catholic and Protestant) on education (restricted sample)*

	Education (years)			Completed Primary School			Completed Secondary School		
	(1) Full Sample	(2) Women	(3) Women	(4) Full Sample	(5) Women	(6) Women	(7) Full Sample	(8) Women	(9) Women
Mission	0.648*** (0.084)	1.053*** (0.074)	0.809*** (0.092)	0.065*** (0.009)	0.114*** (0.008)	0.088*** (0.011)	-0.028*** (0.005)	0.054*** (0.006)	0.029*** (0.008)
Female X Mission	0.447*** (0.068)			0.053*** (0.008)			0.091*** (0.009)		
Mission X Catholic only			-0.557*** (0.162)			-0.059*** (0.018)			-0.016 (0.012)
Mission X (Catholic & Protestant)			0.879*** (0.114)			0.094*** (0.012)			0.073*** (0.011)
No. of Observations	102377	75736	75736	102616	75871	75871	102616	75871	75871
No. of Clusters	4004	4002	4002	4004	4002	4002	4004	4002	4002
R-squared	0.219	0.238	0.246	0.146	0.165	0.171	0.642	0.122	0.127
Mean Dependent Variable	6.800	6.503	6.503	0.561	0.534	0.534	0.363	0.138	0.138

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Clustered standard errors are reported in parentheses with clustering done at the village (enumeration area) level. The sample is restricted to all individuals (or only women where indicated) surveyed in the DHS over the age of 18 and who live at least 5km and at most 100km from the closest mission location. The outcome variables are indicated in the columns where "Education (years)" is years of schooling, "Completed Primary School" is a dummy indicating if an individual completed primary school, and "Completed Secondary School" is a dummy indicating if an individual completed secondary school. The missionary variables are (log of) distance to the closest mission station. All columns contain controls for the ecological characteristics in the surrounding village - elevation, the length of the growing season, rainfall and the average annual diurnal temperature range. Controls are also included for the area surrounding the mission locations from the FAO-GAEZ maps. These are suitability for cultivation of rice, wheat, and corn, elevation, access to fresh water and proximity to an explorer route and colonial railway line as marked on the Century Atlas. Individual controls are for age. Fixed effects for the country and the DHS round are also included in all specifications. P-values for testing the difference between the coefficients of the distance to the closest Protestant mission and distance to the Catholic mission are reported where appropriate.

Table A3: *The impact of the historical presence of missionaries on measures of female empowerment within the household (restricted sample)*

	Age Difference		Domestic violence		Say in Large Exp.		Say in Daily Exp.		Say in Woman's Salary	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Mission	0.160** (0.064)	0.128 (0.090)	0.094*** (0.008)	0.075*** (0.011)	0.002 (0.008)	0.030*** (0.010)	-0.005 (0.013)	0.029* (0.017)	0.009** (0.004)	0.015** (0.006)
Mission X Catholic only		-0.076 (0.129)		-0.038** (0.016)		-0.013 (0.017)		-0.021 (0.027)		-0.010 (0.008)
Mission X (Catholic & Protestant)		0.100 (0.103)		0.055*** (0.012)		-0.053*** (0.012)		-0.064*** (0.019)		-0.007 (0.006)
No. of Observations	48912	48912	72742	72742	54175	54175	20167	20167	37239	37239
No. of Clusters	4472	4472	4477	4477	4473	4473	1248	1248	3487	3487
R-squared	0.012	0.013	0.072	0.074	0.105	0.106	0.164	0.166	0.007	0.007
Mean Dependent Variable	-6.330	-6.330	0.453	0.453	0.537	0.537	0.607	0.607	0.071	0.071

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Clustered standard errors are reported in parentheses with clustering done at the village (enumeration area) level. In columns (1)-(10) the sample includes all women surveyed in the DHS over the age of 18 living at least 5km and at most 100km from the closest mission location. Columns (1)-(10) contain controls for the ecological characteristics in the surrounding village - elevation, the length of the growing season, rainfall and the average annual diurnal temperature range. The outcome variables have all been re-scaled so that positive coefficients indicate greater gender equality - "Age Difference" is the age difference between spouses; "Domestic Violence" is a dummy that equals 1 if the respondent says domestic violence is not justified; "Say in Large Exp." equals 1 if the respondent has a say in large household expenses; "Say in Daily Exp." equals 1 if the respondent has a say in daily expenses; "Say in Women's Salary" equals 1 if the respondent has a say in spending money from her salary. The missionary variables are dummies that equal 1 if a mission station is within 25km radius of the respondents' location. All columns include controls for the area surrounding the mission locations from the FAO-GAEZ maps. These are suitability for cultivation of rice, wheat, and corn, elevation, access to fresh water and proximity to an explorer route and colonial railway line as marked on the Century Atlas. Individual controls are for age. Fixed effects for the country and the DHS round are also included in all specifications.

Table A4: *The impact of the historical presence of missionaries (Catholic and Protestant) on employment (restricted sample)*

	Employed (full-time)			Employed (non-agricultural, skilled)			Employed (paid cash wages)		
	(1) Full Sample	(2) Women	(3) Women	(4) Full Sample	(5) Women	(6) Women	(7) Full Sample	(8) Women	(9) Women
Mission	0.037*** (0.012)	0.059*** (0.010)	0.071*** (0.014)	0.104*** (0.011)	0.077*** (0.009)	0.072*** (0.012)	0.090*** (0.012)	0.095*** (0.012)	0.080*** (0.017)
Female X Mission	0.023* (0.012)			-0.030*** (0.010)			0.008 (0.012)		
Mission X Catholic only			-0.069*** (0.021)			-0.061*** (0.020)			-0.051*** (0.023)
Mission X (Catholic & Protestant)			0.007 (0.016)			0.041*** (0.015)			0.062*** (0.019)
No. of Observations	69042	48665	48665	91533	64921	64921	72612	49681	49681
No. of Clusters	3999	3977	3977	4004	4002	4002	3878	3855	3855
R-squared	0.129	0.121	0.123	0.136	0.098	0.101	0.148	0.116	0.119
Mean Dependent Variable	0.596	0.576	0.576	0.365	0.324	0.324	0.517	0.464	0.464

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Clustered standard errors are reported in parentheses with clustering done at the village (enumeration area) level. The sample includes all individuals (or only women where indicated) surveyed in the DHS over the age of 18 who live at least 5km and at most 100km from the closest mission location. The outcome variables are indicated over the columns where "Employed" equals 1 if a respondent is employed full-time; "Employed (non-agricultural, skilled)" equals 1 if a respondent is employed outside of agriculture and not in unskilled work. The missionary variables are dummies that equal 1 if a mission station is within 25km radius of the respondents' location. All columns contain controls for the ecological characteristics in the surrounding village - elevation, the length of the growing season, rainfall and the average annual diurnal temperature range. Controls are also included for the area surrounding the mission locations from the FAO-GAEZ maps. These are suitability for cultivation of rice, wheat, and corn, elevation, access to fresh water and proximity to an explorer route and colonial railway line as marked on the Century Atlas. Individual controls are for age. Fixed effects for the country and the DHS round are also included in all specifications.

Table A5: *The impact of the historical presence of missionaries (Catholic and Protestant) on self-reported public sector employment (restricted sample)*

	Full Sample	Women	
	(1)	(2)	(3)
Mission	0.011 (0.011)	0.017 (0.011)	0.017 (0.018)
Female X Mission	0.005 (0.014)		
Mission X Catholic only			-0.029 (0.019)
Mission X (Catholic & Protestant)			0.016 (0.020)
No. of Observations	4528	2238	2238
No. of Clusters	704	697	697
R-squared	0.015	0.021	0.024
Mean Dependent Variable	0.046	0.037	0.037

***, **, *, indicates significance at the 1%, 5%, and 10% levels respectively. Standard errors are clustered at the level of the primary sampling unit of the Afrobarometer and the sample is restricted to individuals living within 100km of a mission location. The outcome variables is a dummy that equals 1 if a respondent is employed by the government. The missionary variables are dummies that equal 1 if a mission station is within 25km radius of the respondents' location. Controls are also included for the area surrounding the mission locations from the FAO-GAEZ maps. These are suitability for cultivation of rice, wheat, and corn, elevation, access to fresh water and proximity to an explorer route and colonial railway line as marked on the Century Atlas. Individual controls are for age. P-values for testing the difference between the coefficients of the distance to the closest Protestant mission and distance to the Catholic mission are reported where appropriate.

1.C Distance treatment

In this section I present results where exposure to missionary activity is computed as the distance from the respondent to the closest mission station. The estimating equations can be written as below:

$$y_i = \alpha_c + \beta M_{v(i)} + \phi M_{v(i)} \times female_i + \Gamma X_i + \Lambda X_{v(i)} + \Theta X_{m(i)} + \omega_r + \epsilon_i, \quad (1.4)$$

where y_i represents the various outcome variables for education, empowerment and employment that were used in Section 1.4. $M_{v(i)}$ is the log distance between the respondents' village and the closest mission location, irrespective of type. To estimate the effects by missionary type, I use the following equation:

$$y_i = \alpha_c + \beta_p M_{v(i)}^{Prot} + \beta_c M_{v(i)}^{Cath} + \Gamma X_i + \Lambda X_{v(i)} + \Theta_p X_{p(i)} + \Theta_c X_{c(i)} + \omega_r + \epsilon_i, \quad (1.5)$$

where $M_{v(i)}^{Prot}$ and $M_{v(i)}^{Cath}$ are log distance from the respondent's village to the closest Protestant and Catholic mission respectively. The remaining control variables are the same as in the main estimation. The results are in the tables that follow.

Table A6: *The impact of the historical presence of missionaries (measured as continuous distance) on education*

	Education (years)			Completed Primary School			Completed Secondary School		
	(1) Full Sample	(2) Women	(3) Women	(4) Full Sample	(5) Women	(6) Women	(7) Full Sample	(8) Women	(9) Women
Distance to closest mission	-0.628*** (0.036)	-0.876*** (0.032)		-0.055*** (0.004)	-0.085*** (0.003)		0.017*** (0.002)	-0.051*** (0.003)	
Female X Distance to closest mission	-0.277*** (0.028)			-0.032*** (0.003)			-0.073*** (0.004)		
Distance to closest Protestant mission			-0.599*** (0.038)			-0.061*** (0.004)			-0.032*** (0.003)
Distance to closest Catholic mission			-0.557*** (0.036)			-0.052*** (0.003)			-0.034*** (0.003)
No. of Observations	130621	97100	97100	131013	97332	97332	131013	97332	97332
No. of Clusters	5164	5162	5162	5164	5162	5162	5164	5162	5162
R-squared	0.252	0.270	0.278	0.166	0.187	0.193	0.623	0.142	0.144
H ₀ :Protestant=Catholic			0.506			0.192		0.635	
Mean Dependent Variable	6.786	6.474	6.474	0.567	0.540	0.540	0.368	0.149	0.149

***, **, * indicate significance at the 1%, 5%, and 10% levels respectively. Clustered standard errors are reported in parentheses with clustering done at the village (enumeration area) level. The sample includes all individuals (or only women where indicated) surveyed in the DHS over the age of 18. The outcome variables are indicated in the columns where "Education (years)" is years of schooling, "Completed Primary School" is a dummy indicating if an individual completed primary school, and "Completed Secondary School" is a dummy indicating if an individual completed secondary school. The missionary variables are (log of) distance to the closest mission station. All columns contain controls for the ecological characteristics in the surrounding village - elevation, the length of the growing season, rainfall and the average annual diurnal temperature range. Controls are also included for the area surrounding the mission locations from the FAO-GAEZ maps. These are suitability for cultivation of rice, wheat, and corn, elevation, access to fresh water and proximity to an explorer route and colonial railway line as marked on the Century Atlas. Individual controls are for age. Fixed effects for the country and the DHS round are also included in all specifications. P-values for testing the difference between the coefficients of the distance to the closest Protestant mission and distance to the Catholic mission are reported where appropriate.

Table A7: *The impact of the historical presence of missionaries (measured as continuous distance) on measures of female empowerment within the household*

	Age Difference		Domestic violence		Say in Large Exp.		Say in Daily Exp.		Say in Woman's Salary	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Mission	-0.163*** (0.028)		-0.058*** (0.003)		-0.006* (0.003)		-0.003 (0.006)		-0.001 (0.002)	
Protestant mission		-0.030 (0.034)		-0.038*** (0.004)		-0.001 (0.004)		0.002 (0.007)		-0.003 (0.002)
Catholic mission		-0.176*** (0.033)		-0.037*** (0.004)		0.005 (0.004)		0.006 (0.007)		0.003 (0.002)
No. of Observations	54113	54113	79835	79835	59844	59844	21837	21837	41439	41439
No. of Clusters	4992	4992	4999	4999	4993	4993	1362	1362	3910	3910
R-squared	0.013	0.014	0.073	0.075	0.103	0.102	0.153	0.153	0.007	0.007
H ₀ :Protestant=Catholic		0.011		0.852		0.446		0.767		0.120
Mean Dependent Variable	-6.452	-6.452	0.445	0.445	0.541	0.541	0.609	0.609	0.732	0.074

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Clustered standard errors are reported in parentheses with clustering done at the village (enumeration area) level. In columns (1)-(10) the sample includes all women surveyed in the DHS over the age of 18. Columns (1)-(10) contain controls for the ecological characteristics in the surrounding village - elevation, the length of the growing season, rainfall and the average annual diurnal temperature range. The outcome variables have all been re-scaled so that positive coefficients indicate greater gender equality - "Age Difference" is the age difference between spouses; "Domestic Violence" is a dummy that equals 1 if the respondent says domestic violence is not justified; "Say in Large Exp." equals 1 if the respondent has a say in large household expenses; "Say in Daily Exp." equals 1 if the respondent has a say in daily expenses; "Say in Women's Salary" equals 1 if the respondent has a say in spending money from her salary. The exposure to historical missionary activity is calculated as (log of) the distance between the respondent and the closest mission location. All columns include controls for the area surrounding the mission locations from the FAO-GAEZ maps. These are suitability for cultivation of rice, wheat, and corn, elevation, access to fresh water and proximity to an explorer route and colonial railway line as marked on the Century Atlas. Individual controls are for age. Fixed effects for the country and the DHS round are also included in all specifications. P-values for testing the difference between the coefficients of the distance to the closest Protestant mission and distance to the Catholic mission are reported where appropriate.

Table A8: The impact of the historical presence of missionaries (measured as continuous distance) on employment

	Employed (full-time)			Employed (non-agricultural, skilled)			Employed (paid cash wages)		
	(1) Full Sample	(2) Women	(3) Women	(4) Full Sample	(5) Women	(6) Women	(7) Full Sample	(8) Women	(9) Women
Mission	-0.040*** (0.005)	-0.052*** (0.004)		-0.093*** (0.004)	-0.077*** (0.004)		-0.070*** (0.005)	-0.080*** (0.005)	
Female X Mission	-0.014*** (0.005)			0.017*** (0.004)			-0.013*** (0.005)		
Protestant mission			-0.041*** (0.005)			-0.054*** (0.005)			-0.055*** (0.006)
Catholic mission			-0.024*** (0.005)			-0.040*** (0.004)			-0.047*** (0.005)
No. of Observations	85935	60399	60399	116704	83198	83198	90304	61801	61801
No. of Clusters	5148	5055	5055	5164	5162	5162	4996	4901	4901
R-squared	0.148	0.142	0.142	0.160	0.119	0.120	0.168	0.140	0.143
H ₀ :Protestant=Catholic			0.044			0.079			0.402
Mean Dependent Variable	0.605	0.584	0.584	0.391	0.349	0.349	0.539	0.489	0.489

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Clustered standard errors are reported in parentheses with clustering done at the village (enumeration area) level. The sample includes all individuals (or only women where indicated) surveyed in the DHS over the age of 18. The outcome variables are indicated over the columns where "Employed" equals 1 if a respondent is employed full-time; "Employed (non-agricultural, skilled)" equals 1 if a respondent is employed outside of agriculture and not in unskilled work. The exposure to historical missionary activity is calculated as (log of) the distance between the respondent and the closest mission location. All columns contain controls for the ecological characteristics in the surrounding village - elevation, the length of the growing season, rainfall and the average annual diurnal temperature range. Controls are also included for the area surrounding the mission locations from the FAO-GAEZ maps. These are suitability for cultivation of rice, wheat, and corn, elevation, access to fresh water and proximity to an explorer route and colonial railway line as marked on the Century Atlas. Individual controls are for age, Fixed effects for the country and the DHS round are also included in all specifications. P-values for testing the difference between the coefficients of the distance to the closest Protestant mission and distance to the Catholic mission are reported where appropriate.

1.D Heterogeneous Effects in Urban and Rural Areas

1.D.1 Rural Estimates

In this subsection, I present estimated analogous to the main results but where the sample has been restricted to individuals living in rural areas only.

Table A9: The impact of the historical presence of missionaries on education in rural areas

	Education (years)				Completed Primary School				Completed Secondary School			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Full Sample	Women	Women	Full Sample	Women	Women	Full Sample	Women	Women	Full Sample	Women	Women
Mission	0.456*** (0.083)	0.944*** (0.078)	0.676*** (0.094)	0.056*** (0.010)	0.109*** (0.009)	0.081*** (0.012)	-0.019*** (0.003)	0.038*** (0.005)	0.024*** (0.007)			
Female X Mission	0.524*** (0.070)			0.055*** (0.009)			0.064*** (0.006)					
Mission X Catholic only			-0.315* (0.173)			-0.041** (0.019)					-0.011 (0.012)	
Mission X (Catholic & Protestant)			0.915*** (0.124)			0.100*** (0.015)					0.045*** (0.009)	
No. of Observations	91553	68238	68238	91610	68270	68270	91610	68270	68270			
No. of Clusters	1403	1403	1403	1403	1403	1403	1403	1403	1403			
R-squared	0.213	0.230	0.237	0.132	0.148	0.153	0.732	0.076	0.079			
Mean Dependent Variable	5.927	5.586	5.586	0.485	0.455	0.455	0.319	0.087	0.087			

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Clustered standard errors are reported in parentheses with clustering done at the village (enumeration area) level. The sample is restricted to all individuals (or only women where indicated) surveyed in the DHS over the age of 18 and who live in a rural location. The outcome variables are indicated in the columns where "Education (years)" is years of schooling, "Completed Primary School" is a dummy indicating if an individual completed primary school, and "Completed Secondary School" is a dummy indicating if an individual completed secondary school. The missionary variables are (log of) distance to the closest mission station. All columns contain controls for the ecological characteristics in the surrounding village - elevation, the length of the growing season, rainfall and the average annual diurnal temperature range. Controls are also included for the area surrounding the mission locations from the FAO-GAEZ maps. These are suitability for cultivation of rice, wheat, and corn, elevation, access to fresh water and proximity to an explorer route and colonial railway line as marked on the Century Atlas. Individual controls are for age. Fixed effects for the country and the DHS round are also included in all specifications.

Table A10: *The impact of the historical presence of missionaries on measures of female empowerment within the household in rural areas*

	Age Difference		Domestic violence		Say in Large Exp.		Say in Daily Exp.		Say in Woman's Salary	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Mission	0.100 (0.075)	0.167 (0.108)	0.067*** (0.008)	0.075*** (0.011)	-0.008 (0.009)	0.027** (0.012)	-0.013 (0.014)	0.037** (0.018)	0.014*** (0.004)	0.018** (0.007)
Mission X Catholic only		-0.146 (0.156)		-0.048*** (0.018)		-0.020 (0.019)		-0.039 (0.031)		-0.011 (0.010)
Mission X (Catholic & Protestant)		-0.086 (0.136)		0.006 (0.015)		-0.078*** (0.014)		-0.108*** (0.022)		-0.005 (0.008)
No. of Observations	40706	40706	57053	57053	44464	44464	15990	15990	31230	31230
No. of Clusters	3503	3503	3508	3508	3504	3504	984	984	2718	2718
R-squared	0.016	0.016	0.048	0.049	0.103	0.105	0.149	0.153	0.009	0.009
Mean Dependent Variable	-6.502	-6.502	0.401	0.401	0.527	0.527	0.600	0.600	0.072	0.072

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Clustered standard errors are reported in parentheses with clustering done at the village (enumeration area) level. In columns (1)-(10) the sample includes all women surveyed in the DHS over the age of 18 who live in rural areas. Columns (1)-(10) contain controls for the ecological characteristics in the surrounding village - elevation, the length of the growing season, rainfall and the average annual diurnal temperature range. The outcome variables have all been re-scaled so that positive coefficients indicate greater gender equality - "Age Difference" is the age difference between spouses; "Domestic Violence" is a dummy that equals 1 if the respondent says domestic violence is not justified; "Say in Large Exp." equals 1 if the respondent has a say in large household expenses; "Say in Daily Exp." equals 1 if the respondent has a say in daily expenses; "Say in Women's Salary" equals 1 if the respondent has a say in spending money from her salary. The missionary variables are dummies that equal 1 if a mission station is within 25km radius of the respondents' location. All columns include controls for the area surrounding the mission locations from the FAO-GAEZ maps. These are suitability for cultivation of rice, wheat, and corn, elevation, access to fresh water and proximity to an explorer route and colonial railway line as marked on the Century Atlas. Individual controls are for age. Fixed effects for the country and the DHS round are also included in all specifications.

Table A11: The impact of the historical presence of missionaries on employment in rural areas

	Employed (full-time)			Employed (non-agricultural, skilled)			Employed (cash wages)		
	(1) Full Sample	(2) Women	(3) Women	(4) Full Sample	(5) Women	(6) Women	(7) Full Sample	(8) Women	(9) Women
Mission	0.025** (0.013)	0.048*** (0.010)	0.043*** (0.014)	0.077*** (0.011)	0.057*** (0.008)	0.049*** (0.011)	0.081*** (0.012)	0.081*** (0.012)	0.054*** (0.017)
Female X Mission	0.024* (0.013)			-0.022** (0.010)			0.003 (0.014)		
Mission X Catholic only			-0.028 (0.021)			-0.037** (0.017)			-0.023 (0.024)
Mission X (Catholic & Protestant)			0.028 (0.018)			0.041*** (0.015)			0.082*** (0.020)
No. of Observations	62295	44438	44438	82636	59416	59416	65336	45442	45442
No. of Clusters	1399	1351	1351	1403	1403	1403	1401	1355	1355
R-squared	0.142	0.138	0.139	0.088	0.060	0.062	0.110	0.084	0.087
Mean Dependent Variable	0.535	0.513	0.513	0.285	0.251	0.251	0.442	0.394	0.394

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Clustered standard errors are reported in parentheses with clustering done at the village (enumeration area) level. The sample includes all individuals (or only women where indicated) surveyed in the DHS over the age of 18 who live in a rural area. The outcome variables are indicated over the columns where "Employed" equals 1 if a respondent is employed full-time; "Employed (non-agricultural, skilled)" equals 1 if a respondent is employed outside of agriculture and not in unskilled work. All columns contain controls for the ecological characteristics in the surrounding village - elevation, the length of the growing season, rainfall and the average annual diurnal temperature range. Controls are also included for the area surrounding the mission locations from the FAC-GAEZ maps. These are suitability for cultivation of rice, wheat, and corn, elevation, access to fresh water and proximity to an explorer route and colonial railway line as marked on the Century Atlas. Individual controls are for age. Fixed effects for the country and the DHS round are also included in all specifications. P-values for testing the difference between the coefficients of the distance to the closest Protestant mission and distance to the Catholic mission are reported where appropriate.

1.D.2 Urban Estimates

In this subsection, I present estimated analogous to the main results but where the sample has been restricted to individuals living in urban areas only.

Table A12: The impact of the historical presence of missionaries on education in urban areas

	Education (years)			Completed Primary School			Completed Secondary School		
	(1) Full Sample	(2) Women	(3) Women	(4) Full Sample	(5) Women	(6) Women	(7) Full Sample	(8) Women	(9) Women
Mission	0.280 (0.178)	0.799*** (0.155)	0.339* (0.190)	0.016 (0.017)	0.075*** (0.015)	0.037** (0.018)	-0.045*** (0.013)	0.044*** (0.014)	0.004 (0.020)
Female X Mission	0.545*** (0.130)			0.062*** (0.014)			0.102*** (0.021)		
Mission X Catholic only			0.257 (0.274)			0.029 (0.026)			0.028 (0.026)
Mission X (Catholic & Protestant)			0.857*** (0.184)			0.067*** (0.016)			0.072*** (0.020)
No. of Observations	39068	28862	28862	39403	29062	29062	39403	29062	29062
No. of Clusters	901	900	900	901	900	900	901	900	900
R-squared	0.134	0.140	0.145	0.074	0.087	0.090	0.407	0.107	0.109
Mean Dependent Variable	8.799	8.572	8.572	0.756	0.740	0.740	0.480	0.295	0.295

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Clustered standard errors are reported in parentheses with clustering done at the village (enumeration area) level. The sample is restricted to all individuals (or only women where indicated) surveyed in the DHS over the age of 18 and who live in an urban location. The outcome variables are indicated in the columns where "Education (years)" is years of schooling, "Completed Primary School" is a dummy indicating if an individual completed primary school, and "Completed Secondary School" is a dummy indicating if an individual completed secondary school. The missionary variables are (log of) distance to the closest mission station. All columns contain controls for the ecological characteristics in the surrounding village - elevation, the length of the growing season, rainfall and the average annual diurnal temperature range. Controls are also included for the area surrounding the mission locations from the FAO-GAEZ maps. These are suitability for cultivation of rice, wheat, and corn, elevation, access to fresh water and proximity to an explorer route and colonial railway line as marked on the Century Atlas. Individual controls are for age. Fixed effects for the country and the DHS round are also included in all specifications. P-values for testing the difference between the coefficients of the distance to the closest Protestant mission and distance to the Catholic mission are reported where appropriate.

Table A13: *The impact of the historical presence of missionaries on measures of female empowerment within the household in urban areas*

	Age Difference		Domestic violence		Say in Large Exp.		Say in Daily Exp.		Say in Woman's Salary	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Mission	0.239*	0.099	0.062***	0.018	-0.012	0.019	-0.056**	-0.021	-0.007	0.007
	(0.122)	(0.159)	(0.017)	(0.023)	(0.016)	(0.022)	(0.023)	(0.033)	(0.010)	(0.012)
Mission X Catholic only		-0.040		0.025		0.006		0.034		-0.028*
		(0.222)		(0.031)		(0.033)		(0.046)		(0.016)
Mission X (Catholic & Protestant)		0.284*		0.076***		-0.061***		-0.061**		-0.017
		(0.168)		(0.021)		(0.023)		(0.030)		(0.010)
No. of Observations	13407	13407	22782	22782	15380	15380	5847	5847	10209	10209
No. of Clusters	1489	1489	1491	1491	1489	1489	378	378	1192	1192
R-squared	0.014	0.015	0.057	0.060	0.099	0.101	0.189	0.191	0.006	0.006
Mean Dependent Variable	-6.298	-6.298	0.555	0.555	0.581	0.581	0.632	0.632	0.081	0.081

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Clustered standard errors are reported in parentheses with clustering done at the village (enumeration area) level. In columns (1)-(10) the sample includes all women surveyed in the DHS over the age of 18 who live in urban areas. Columns (1)-(10) contain controls for the ecological characteristics in the surrounding village - elevation, the length of the growing season, rainfall and the average annual diurnal temperature range. The outcome variables have all been re-scaled so that positive coefficients indicate greater equality - "Age Difference" is the age difference between spouses; "Domestic Violence" is a dummy that equals 1 if the respondent says domestic violence is not justified; "Say in Large Exp." equals 1 if the respondent has a say in large household expenses; "Say in Daily Exp." equals 1 if the respondent has a say in daily expenses; "Say in Women's Salary" equals 1 if the respondent has a say in spending money from her salary. The missionary variables are dummies that equal 1 if a mission station is within 25km radius of the respondents' location. All columns include controls for the area surrounding the mission locations from the FAO-GAEZ maps. These are suitability for cultivation of rice, wheat, and corn, elevation, access to fresh water and proximity to an explorer route and colonial railway line as marked on the Century Atlas. Individual controls are for age, Fixed effects for the country and the DHS round are also included in all specifications. P-values for testing the difference between the coefficients of the distance to the closest Protestant mission and distance to the Catholic mission are reported where appropriate.

Table A14: *The impact of the historical presence of missionaries on employment in urban areas*

	Employed (full-time)			Employed (non-agricultural, skilled)			Employed (cash wages)		
	(1) Full Sample	(2) Women	(3) Women	(4) Full Sample	(5) Women	(6) Women	(7) Full Sample	(8) Women	(9) Women
Mission	0.021 (0.020)	0.018 (0.017)	-0.001 (0.024)	0.058*** (0.017)	0.045*** (0.016)	0.014 (0.020)	0.043*** (0.016)	0.044** (0.020)	0.010 (0.024)
Female X Mission	0.000 (0.020)			-0.010 (0.016)			0.011 (0.017)		
Mission X Catholic only			0.028 (0.033)			0.056* (0.033)			0.005 (0.039)
Mission X (Catholic & Protestant)			0.028 (0.021)			0.042** (0.019)			0.065*** (0.022)
No. of Observations	23640	15961	15961	34068	23782	23782	24968	16359	16359
No. of Clusters	900	889	889	901	900	900	896	885	885
R-squared	0.062	0.063	0.063	0.110	0.068	0.068	0.073	0.054	0.057
Mean Dependent Variable	0.788	0.782	0.782	0.647	0.594	0.594	0.792	0.754	0.754

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Clustered standard errors are reported in parentheses with clustering done at the village (enumeration area) level. The sample includes all individuals (or only women where indicated) surveyed in the DHS over the age of 18 who live in an urban area. The outcome variables are indicated over the columns where "Employed" equals 1 if a respondent is employed full-time; "Employed (non-agricultural, skilled)" equals 1 if a respondent is employed outside of agriculture and not in unskilled work. The missionary variables are dummies that equal 1 if a mission station is within 25km radius of the respondents' location. All columns contain controls for the ecological characteristics in the surrounding village - elevation, the length of the growing season, rainfall and the average annual diurnal temperature range. Controls are also included for the area surrounding the mission locations from the FAO-GAEZ maps. These are suitability for cultivation of rice, wheat, and corn, elevation, access to fresh water and proximity to an explorer route and colonial railway line as marked on the Century Atlas. Individual controls are for age, Fixed effects for the country and the DHS round are also included in all specifications. P-values for testing the difference between the coefficients of the distance to the closest Protestant mission and distance to the Catholic mission are reported where appropriate.

1.E Gender Equality and Employment Residuals

In this section I present estimates for the correlations between the residuals from regressing each employment variable on education and other individual and village level control variables and each of the variables that measure women's employment within the household. The individual controls are age and gender. The village-level controls are variables that capture the ecological and climactic conditions of the surrounding area and are the same as those used in the main estimation when studying the impact of missionary activity.

Table A15: *The correlation between measures of female empowerment within the household and the residuals from female full-time employment and education*

	Employed				
	(1)	(2)	(3)	(4)	(5)
	Age Difference	Domestic violence	Say in Large Exp.	Say in Daily Exp.	Say in Woman's Salary
Residuals	-0.048 (0.064)	0.035*** (0.006)	0.039*** (0.007)	0.024** (0.011)	0.005 (0.004)
No. of Observations	40414	57600	44232	15329	30803
No. of Clusters	4817	4893	4831	1338	3748
R-squared	0.012	0.066	0.105	0.139	0.009

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Clustered standard errors are reported in parentheses with clustering done at the village (enumeration area) level. The coefficient reported is the correlation between the residual variation from regressing the outcome - equals 1 if the respondent was employed full time in the previous year - on education, and the relevant female empowerment variable. The number of clusters varies by outcome variable as there is some variation in the sample due to when the question was asked in the DHS and in which countries. The sample includes all women surveyed in the DHS over the age of 18. All the columns contain controls for the ecological characteristics in the surrounding village - elevation, the length of the growing season, rainfall and the average annual diurnal temperature range. All columns include controls for the area surrounding the mission locations from the FAO-GAEZ maps. These are suitability for cultivation of rice, wheat, and corn, elevation, access to fresh water and proximity to an explorer route and colonial railway line as marked on the Century Atlas. Individual controls are for age. Fixed effects for the country and the DHS round are also included in all specifications.

Table A16: *The correlation between measures of female empowerment within the household and the residuals from female non-agricultural skilled employment and education*

	Employed (non-agriculture, skilled)				
	(1)	(2)	(3)	(4)	(5)
	Age Difference	Domestic violence	Say in Large Exp.	Say in Daily Exp.	Say in Woman's Salary
Residuals	0.104 (0.063)	0.038*** (0.006)	0.113*** (0.006)	0.146*** (0.009)	0.029*** (0.004)
No. of Observations	53901	79467	59580	21630	41294
No. of Clusters	4992	4999	4993	1362	3909
R-squared	0.013	0.061	0.111	0.168	0.009

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Clustered standard errors are reported in parentheses with clustering done at the village (enumeration area) level. The coefficient reported is the correlation between the residual variation from regressing the outcome - equals 1 if the respondent was employed in non-agricultural skilled labour in the previous year - on education, and the relevant female empowerment variable. The number of clusters varies by outcome variable as there is some variation in the sample due to when the question was asked in the DHS and in which countries. In columns (1)-(10) the sample includes all women surveyed in the DHS over the age of 18. Columns (1)-(10) contain controls for the ecological characteristics in the surrounding village - elevation, the length of the growing season, rainfall and the average annual diurnal temperature range. All columns include controls for the area surrounding the mission locations from the FAO-GAEZ maps. These are suitability for cultivation of rice, wheat, and corn, elevation, access to fresh water and proximity to an explorer route and colonial railway line as marked on the Century Atlas. Individual controls are for age. Fixed effects for the country and the DHS round are also included in all specifications.

Table A17: *The correlation between measures of female empowerment within the household and the residuals from female employment for cash wages and education*

	Employed (cash wages)				
	(1)	(2)	(3)	(4)	(5)
	Age Difference	Domestic violence	Say in Large Exp.	Say in Daily Exp.	Say in Woman's Salary
Residuals	0.020 (0.066)	0.056*** (0.006)	0.073*** (0.007)	0.056*** (0.011)	0.012*** (0.004)
No. of Observations	42708	61470	46807	16179	32623
No. of Clusters	4838	4901	4850	1339	3769
R-squared	0.012	0.065	0.109	0.144	0.009

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Clustered standard errors are reported in parentheses with clustering done at the village (enumeration area) level. The coefficient reported is the correlation between the residual variation from regressing the outcome - equals 1 if the respondent was employed for cash wages in the previous year - on education, and the relevant female empowerment variable. The number of clusters varies by outcome variable as there is some variation in the sample due to when the question was asked in the DHS and in which countries. The sample includes all women surveyed in the DHS over the age of 18. All columns contain controls for the ecological characteristics in the surrounding village - elevation, the length of the growing season, rainfall and the average annual diurnal temperature range. All columns include controls for the area surrounding the mission locations from the FAO-GAEZ maps. These are suitability for cultivation of rice, wheat, and corn, elevation, access to fresh water and proximity to an explorer route and colonial railway line as marked on the Century Atlas. Individual controls are for age. Fixed effects for the country and the DHS round are also included in all specifications.

Chapter 2

The Impact of Reservation on Female Representation - Evidence from Uttar Pradesh

2.1 Introduction

Women are under-represented in governments worldwide and this is changing very slowly. In fact, at the current growth-rate, the UN estimates that achieving gender equality would take another hundred and thirty years (UN Women, 2021). To promote greater representation of women, a large number of countries use some form of gender quotas, but the efficacy of these policies, especially outside of their mechanical effects, remains debated. In this chapter, I aim to dig into this question. Taking advantage of the programme design of a nationwide affirmative action policy in India, I evaluate its impact on increasing the representation of women in local government and study the channels that may be at work.

In 1993, the Indian government introduced quotas for women by way of a policy called reservation. Under this policy, it created a system where in each electoral cycle, certain elected offices would be *reserved* for women

and specific marginalised caste groups. At the same time, it formalized a decentralised system of rural governance with democratically elected village councils (Gram Panchayats) headed by a village mayor (Gram Pradhan) which were to be the focal point of promoting grass-roots development. These two institutions were designed to work together and implied that in a given election cycle, some village mayoral posts could only be occupied by a woman and/or an individual from a marginalised caste group.

Furthermore, as an additional feature of this programme, the reservation status of the mayoral posts of the village would rotate after one election cycle to ensure that a village did not fall under the same reservation category in two consecutive election cycles. This creates a form of natural experiment to estimate the effects of the programme. Focusing on the villages with mayoral posts that become unreserved after an election cycle in which they were reserved, I estimate the effect of reservation on the likelihood that a woman is elected, both in general and separately by caste groups. Moreover, I investigate to what extent these effects can be attributed to re-elected incumbents compared to changes in the composition of the pool of candidates. I analyse the broader effects on the quality of candidates following reservation. Finally, I estimate the effect of a village experiencing multiple cycles of reservation for women, irrespective of caste, on the likelihood that a woman is elected.

To conduct my analyses, I build a dataset which covers the outcomes of three election cycles (in about fifty-thousand villages) in Uttar Pradesh and records the caste and gender of each elected village mayor. In each election, a village mayoral post may be reserved for women in one of three ways: "General Woman" is reserved for women without any caste restrictions, "Other Backward Classes - Woman" is reserved for women from the "Other Backward Classes" caste group, and "Scheduled Caste - Woman" is reserved for women from the "Scheduled Caste" caste group.¹

¹There is a fourth category - "Scheduled Tribe - Woman" which is for women who are from the "Scheduled Tribe" caste group. However, in this setting, the population of "Scheduled Tribes" is very low and therefore I do not put a great deal of emphasis

As a first step, I study the effect of reservation for women in general, irrespective of caste, and estimate that having a mayoral post reserved for women increases the likelihood that a woman is elected by about 10% on average. When taking a closer look, an interesting pattern emerges. The reservation for lower-caste women, specifically "Other Backward Classes" (OBC) women, has a particularly strong positive effect - I estimate that it is associated with a nearly 50% increase in the probability that an OBC woman is elected in the next election. In contrast, the effects for "Scheduled Caste" (SC) women are less consistent, suggesting that caste-gender effects may in fact vary by caste.²

To explore what is driving the positive effects of reservation on the election of women, I turn to investigate the role of incumbency, specifically whether these effects are coming from the re-election of incumbent women mayors. I find that this channel may at best be only partially responsible as mayors elected through reservation are significantly less likely to compete in the next election - while around 50% of the unreserved incumbent mayors compete in the next election, on average less than 20% of the reserved women incumbent mayors do so. However, conditional on running, I find that incumbent women mayors elected under the "General Woman" reservation category are no less likely to be re-elected than their unreserved counterparts with nearly 40% of them winning the election. While this effect is specific to the GW reservation category, it suggests that there might be some positive selection among reserved incumbent women mayors who compete in the next election. Moreover, it also provides suggestive evidence against some of the main criticism of reservation, that women mayors elected through reservation would simply be figureheads, controlled by their male relatives (Ramesh and Ali, 2001). At the same time, however, incumbent women mayors from the OBC women and SC women reservation categories do not en-

on this group.

²There are multiple different categories of reservation and those based on caste are - "Other Backward Classes", "Scheduled Caste" and "Scheduled Tribe" - and the latter two categories are relatively more dis-advantaged than the former.

joy the same success rate and are between 12 percentage points and 20 percentage points less likely to be elected, even conditional on running.

Given the low rates of incumbent reserved mayors competing in the following election, it is perhaps unsurprising that reservation causes a big change in *who* competes in the following election. Following reservation in 2010, villages that become unreserved in 2015 see an increase in the number of candidates. This is true of all caste-based reservation including reservation for lower caste women. Interestingly, reservation for women without any caste restrictions does not have the same effect. After reservation for OBC (SC) women, there is an increase of about 10% (20%) in the total number of candidates. Furthermore, this corresponds to a 13% (18%) increase in the total number of women candidates following reservation for OBC (SC) women and a 20% (50%) increase in the share of OBC (SC) women candidates. However, it might be worth keeping in mind however that large increase in the share of OBC (SC) women candidates may be partly due to a low initial share of OBC (SC) women candidates. Nonetheless, the positive effects on the number of women candidates, and in particular the number of lower-caste women candidates speaks to the work done by Beaman et al. (2012) which shows that exposure to female mayors through reservations leads to an increase in the aspirations of teenage girls. It is plausible that having experienced an OBC (SC) woman Gram Pradhan inspires other OBC (SC) women to compete in elections even in the absence of reservation.

In addition to the increase in the number of candidates, I also explore how the quality of candidates, as measured by literacy, changes following reservation. It is worth noting that the average literacy in rural Uttar Pradesh is only 65% (Census of India, 2011), indicating that this is a potentially meaningful margin. Similar to the results on the number of candidates, villages that become unreserved in 2015, after caste-based reservation in 2010, experience an increase in the number of literate candidates. While the "General Woman", which is reservation for women without caste restrictions, has no effect, reservation for OBC (SC) women is associated with a 15% (25%) increase in the number of

literate candidates. Furthermore, this increase is across genders, and is, in fact, larger for men - in the election following an election with reservation for OBC (SC) women there is a 17% (27%) increase in the number of literate male candidates. This result speaks directly to Besley et al. (2017) which shows that the efforts made to increase the representation of women in political parties in Sweden led to an increase in the competence of male politicians. I find some evidence that reservation for OBC (SC) women also leads to a similar increase in the number of literate women; however, the estimated coefficient is not as stable as the one for men. Finally, reservation for OBC women is also followed by a 16% increase in the share of literate OBC women. The corresponding effect on the share of literate SC women candidates following reservation for SC women is much larger; however, the baseline share of literate SC women candidates is less than 1%.

Finally, I estimate that reservation for women across multiple cycles does further raise the likelihood that a woman is elected as GP in an unreserved village. Pooling all types of reservation for women together, with and without caste restrictions, I find some suggestive evidence that there is an increase in the likelihood of electing a woman mayor when a village mayoral post is reserved more than once. The estimated coefficient for villages that are reserved for women three times is double the size of the coefficient for a village that was reserved just once. However, only the latter coefficient is statistically significant.

The work done in this chapter first contributes to the extensive literature on India's reservation policy. Understanding the impact of the policy on financing decisions has been at the centre of the literature which started with Chattopadhyay and Duflo (2004)'s seminal paper. These authors found that women mayors made investment decisions in sectors that were more in line with what women reported as being important. Furthermore, Pande (2003) presented the effects of caste-based reservation on the public finance decisions in India's State Legislatures. Reservation created opportunities for greater representation of marginalised caste groups in state governments which, in turn, resulted in their being

able to direct funds. At the intersection of caste and gender lies Clots-Figueras (2011) which shows that lower-caste women voted for more pro-female policies, while upper caste women's support for policies did not differ from that of their male counterparts.³ Overall, the policy of reservation led to the increased representation of women and Ban and Rao (2008) showed that it went beyond simply descriptive representation - they find that women elected through reservation were of high quality and were not simply figure-heads. However, the effect of reservation of the provision of public goods and services has been somewhat less consistent across contexts. While Ban and Rao (2008) do not find any evidence that women mayors performed any differently from men, Gajwani and Zhang (2014) show that women mayors performed slightly worse than men, a fact that they attribute to women facing more challenges when co-ordination with higher-level officials was needed.

However, aside from the effects on public good provision, the reservation policy had other positive effects. Beaman et al. (2009) find that exposure to female mayors through reservation resulted in a reduction in bias against female mayors. Both men and women in villages that had had female mayors in two consecutive election cycles had better perceptions of the efficacy of female leadership. Furthermore, Beaman et al. (2012) present evidence that teenage girls who lived in villages with female mayors had higher aspirations. Bhavnani (2009) finds that reservation for women, irrespective of caste, in an urban setting in one election has a positive effect on the election of women in the subsequent election, though the effects are largely driven by the re-election of incumbents.⁴ The work presented in this chapter is closely related to this part of the literature wherein reservation raises the likelihood that women, especially lower-caste women, are elected in the subsequent election cy-

³The pro-female policy in question refers to an amendment of inheritance laws to make them more gender equal.

⁴In Bhavnani (2009) he estimates the effect of reservation on ward elections in Mumbai. While he finds a positive effect of reservation for women on the election of women in a subsequent unreserved election cycle, he finds that of the 8 women elected in unreserved seats, 6 of them were incumbents who were successfully re-elected.

cle. This may reflect a number of drivers, including a reduction in bias from the voters' point of view, the entry of more candidates from these groups thanks to increased aspirations and positive selection of reserved mayoral incumbents.

Finally, this chapter presents evidence of the broader effects of reservation on the quantity and quality of the candidates in the election when a village goes from being reserved to unreserved. In particular, the positive effect of reservation for lower-caste (OBC and SC) women on the quality of male candidates speaks to Besley et al. (2017) which shows that the efforts to improve the representation of women in Swedish party lists led to improvements in the quality of male politicians on party lists. While the measure of candidate quality in this chapter is somewhat narrowly defined as it is restricted to literacy, the general similarity of the effects in very different contexts is worth noting. Thus, this chapter contributes in part to the large literature on the effects of quotas for women in politics (for example Baltrunaite et al., 2014, Bhalotra et al., 2018, O'Brien and Rickne, 2016, Murray, 2010, De Paola et al., 2010, Campa, 2011).

This chapter is organised as follows. In the next section (Section 2.2) I present some background on Uttar Pradesh, the local government structure as well as the different reservation categories. In Section 2.3, I outline the different datasets used for the analyses in this paper, and in Section 2.4, I present my identification strategy using the design of the reservation policy. Section 2.5 presents the estimation and results and finally, the chapter concludes with Section 2.6.

2.2 Background and Context

2.2.1 Panchayati Raj

Panchayati Raj is the name given to the structure of the local rural government. When India gained independence, the Republic of India was established as a federation of states. However, Mahatma Gandhi had

envisioned further decentralisation, specifically in the form of independently functioning village governments and to this end, the idea of village governance had consistently been a recurring topic in political debates. Finally, in the early 1990s, the Indian government passed the 73rd and 74th constitutional amendments to establish and give formal powers to such local government structures in both rural and urban India.

In rural India, the Gram Panchayat, or village government, was created. It was to be elected every 5 years by the voters who lived in these villages and would be headed by a president, namely the Gram Pradhan. Both the members of the Panchayat as well as the Gram Pradhan (GP) were to be elected using a first past the post system.⁵ It is perhaps worth noting that at the time when the role and responsibilities of the Panchayati Raj Institutions were clearly delineated, certain states had already been implementing a similar form of village governance,⁶ but these laws formalised the powers and functions of the different levels of local rural and urban government. Furthermore, they created a structure for local elections, defined the length of election cycles, and created a level of uniformity across states for the responsibilities of the rural governments.

While, the Gram Panchayat was traditionally composed of five people, with the establishment of a more formal Panchayati Raj Institution, the council size was determined by the population that it governed, with a maximum of 10000 (Kaletski and Prakash, 2016). The Gram Pradhan (GP) presides over all village level meetings and is the highest government authority in the village. The GP is in charge of almost every aspect of village life ranging from the construction and maintenance of village roads, to the establishment and running of healthcare institutions and schools, to the promotion of welfare programmes. They are the key players in identifying the requirements of the village and implementing development programmes (Government of India, 1947). Moreover, in Uttar

⁵This is unlike some other states which have been analysed, namely, West Bengal, (Chattopadhyay and Duflo, 2004), Karnataka and Kerala (Ban and Rao, 2008), as well as Maharashtra (Beaman et al., 2012), where Pradhans are elected indirectly.

⁶These include West Bengal (Chattopadhyay and Duflo, 2004), Uttar Pradesh (Government of India, 1947), and Karnataka (Ban and Rao, 2008).

Pradesh, the GP is responsible for promoting adult literacy, vocational training programmes and maternity and child care programmes. In order to maximise its efficacy in recognising key village issues, the GP is required to hold 2 meetings per year which all villagers are invited to attend and raise whatever issues they deem important. Thus, the GP is truly at the core of India's grass-roots development.

2.2.2 Reservation

India has taken conscious steps to promote the representation of women as well as traditionally excluded or under-represented minorities in a number of spheres including higher education, public sector employment, and, with the establishment of the Panchayati Raj Institutions in 1993, in local government. Thus, when establishing the Panchayati Raj Institutions in 1993, the "reservation" of certain government posts for women and minorities ⁷ was also introduced.

The policy of "reservation" in local government means that in a certain election cycle, a given position is *reserved* for a woman or a person from a certain caste or a combination of the two. In other words, if a post is reserved for women or for certain castes, then the post may only be filled by an individual who meets these criteria. While women are under-represented in political spheres across the world, the caste system in India has allowed for an almost institutionalised exclusion of certain individuals. As a result, there is a marked under-representation of these individuals in positions of power within the government. By introducing reservation at the same time as formalizing village governance, the central Indian government aimed to simultaneously give villages greater power over their own management and to ensure opportunities for representation of women and minorities in these new political offices. The need for such a policy is especially relevant since the identity of the policy maker matters for policy design and implementation (see the citizen

⁷In higher education institutions and in public sector employment, usually a number of seats or a share of certain job posts are similarly "reserved" for vulnerable minorities, usually identified using the sub-caste or "jati".

candidate models of Osborne and Slivinski, 1996 and Besley and Coate, 1997).

In practice, what the reservation meant within the Panchayati Raj Institutions (PRI) is that in a given election cycle, a certain share of all Gram Pradhan posts could be filled by either women, individuals who met certain caste requirements or a combination of the two, thereby creating eight categories: Unreserved (UR), General Woman (GW), Other Backward Classes (OBC), Other Backward Classes Woman (OBCW), Scheduled Caste (SC), Scheduled Caste Woman (SCW), Scheduled Tribe (ST), and Scheduled Tribe Woman (STW). If a post is "Unreserved", it means that there are no restrictions and the election is open to anyone who would like to compete. Reservation for "General Woman" means that the post can only be filled by a woman, irrespective of caste. The "Scheduled Caste" reservations are for individuals who were traditionally excluded by the rest of society through the caste system. For higher castes where reservation for the entire caste was inappropriate, certain sub-castes whose members were found to be economically worse off/excluded were put under the title of "Other Backward Classes".⁸ In each state there is a list of sub-castes that qualify as OBC. "Scheduled Tribes" were those tribes that existed outside the caste system but had been unable to gain access to formal offices without affirmative action policies. Within the SC, OBC, and ST reservations, a third of the posts were reserved for women from these castes or sub-castes and this gives us the SCW, OBCW, STW reservation categories. Posts fall into different reservation categories in a cyclical manner and this is explained in further detail below.

The laws that created the structure and posts of the PRI also outlined the reservation process. In Uttar Pradesh, this meant that reservation was done such that the proportion of GP posts that were reserved for SC, ST and OBC was relative to their proportional population in the state subject to a maximum. Furthermore, villages were reserved for each of

⁸This was to combat potential cream skinning behaviour of better off individuals who still had the same caste.

the caste-based categories in a manner such that the higher the share of that caste within the village the higher priority or likelihood that the GP post would be reserved for that caste category. After determining whether in an election cycle the GP post would have caste based reservation or not, then one-third of all villages was reserved for women GPs. This means that one third of the villages without a caste based reservation would be reserved for GW, one-third that would have been reserved for SC will be reserved for SCW (the remaining will be reserved for SC), one-third of those reserved for OBC will be reserved for OBCW and finally one-third that would have been reserved for ST will be reserved for STW.

The system of reservation is largely common across all states and is implemented in a rotating manner. In Uttar Pradesh, the system of reservation has a further caveat which is that a post should not be reserved under the same caste/gender reservation for two consecutive election cycles. For example, if a post is reserved for OBCW in election 1, then in election 2 it cannot be reserved for either OBC or OBCW. Relatedly, if a post is UR in election 1, it can fall into any reservation category in election 2. This is illustrated in Figure 2.1 below. It is this system that creates the opportunity to explore what happens in a village following reservation, i.e. when a village moves from one reservation category to unreserved in the following cycle.

Figure 2.1: Rotation of categories across election cycles starting from Unreserved in 2005

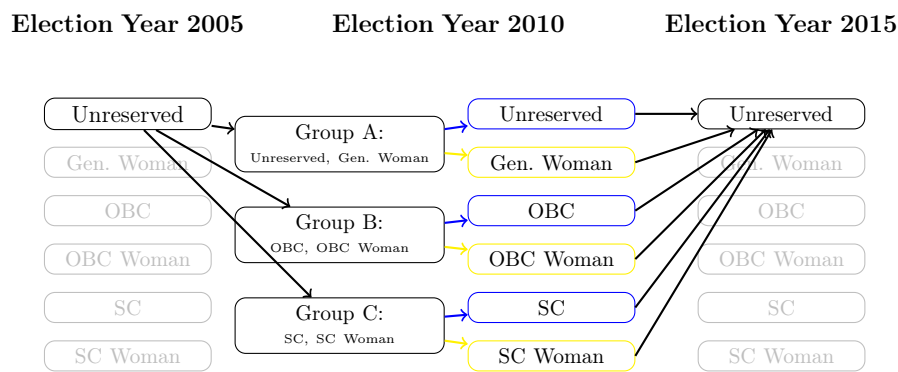
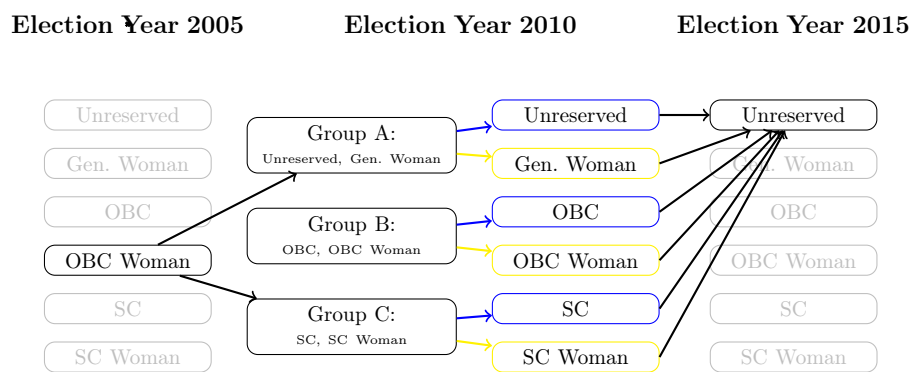


Figure 2.2: Rotation of categories across election cycles starting from Other Backward Classes (OBC) Woman in 2005



2.2.3 Uttar Pradesh

Located in the north of India, Uttar Pradesh is India’s most populous state with a population of approximately 200 million people. At the same time, it is also one of the country’s least developed and poorest states. With over seventy-five percent of its population living in rural areas (Census of India, 2011), Uttar Pradesh’s lack of development can be easily seen in its low literacy and high child labour rates. The average

literacy rate in the state is 68%, which is considerably lower than the national average of approximately 74% (Census of India, 2011). However, being below the national average still hides the huge gender and urban-rural disparity in literacy as the literacy rate for rural women in Uttar Pradesh is a meagre 48%. These statistics underscore that not only is Uttar Pradesh underdeveloped overall, but also the situation of women in rural UP is particularly acute. In fact, despite being home to India's first, and only, female Prime Minister, Indira Gandhi, Uttar Pradesh, like its neighbouring states of Bihar and Rajasthan, is notorious for gender inequalities ranking 25th out of 29 states for the relative status of women in India (Ban and Rao, 2008, Filmer and Pritchett, 1998). In 2011, the child sex ratio of Uttar Pradesh was 902 girls for every 1000 boys.⁹

At the same time, Uttar Pradesh is among the first states to have rural local governance with Gram Panchayats being in use since 1947. However, prior to the constitutional amendments in the 1990s that formalised the village level government, the Panchayats were run in a traditional manner village elders who were not elected but rather self-appointed. And, in line with North India's patriarchal and caste-based society, the representation of women and lower-caste individuals in such governing bodies was non-existent (Pande, 2003).

Uttar Pradesh's distinct combination of underdevelopment and long history of village level governance makes it an interesting environment to explore the effects of reservation for women, particularly lower-caste women, on representation.

2.3 Data

The main source of data is the State Election Commission of Uttar Pradesh which provides village level election data from 2005 onwards. In UP, Gram Panchayat elections are held every 5 years with the first election taking place in 1995, following the passing of the Panchayati Raj

⁹The overall sex ratio in Uttar Pradesh is 912 women for every 1000 men and the natural sex ratio is approximately 952 females for 1000 males (WHO).

Institutions bill in 1993. The SEC provided data for 2005 and 2010 on PDFs which were scraped for this paper. The data for the 2015 election, including complete candidate lists for approximately 55,000 villages, was available on the SEC website where each village had its own webpage and was web-scraped for my analyses.¹⁰

I put together a dataset of approximately 155,000 village elections across 75 electoral districts in Uttar Pradesh.¹¹ Due to data constraints, I restrict my main analyses to elections from 2005-2015 in Uttar Pradesh. Elections take place every five years and in each election year, the SEC conducts the election using a secret ballot system and members of the Panchyat (council) as well as the Gram Pradhan (president) are elected using a first-past-the-post system. The share of villages under each reservation category is shown in the table below.¹²

Table 2.1: *Share of villages falling under each reservation category in Uttar Pradesh*

Reservation Category	2005	2010	2015
Unreserved	0.29	0.35	0.35
Gen. Woman	0.22	0.16	0.17
Other Backward Classes	0.11	0.18	0.18
Other Backward Classes - Woman	0.17	0.10	0.09
Scheduled Caste	0.13	0.14	0.13
Scheduled Caste - Woman	0.17	0.07	0.07
Total No. of Villages	46727	47674	53338

Note: This table shows the share of villages in Uttar Pradesh that falls under each reservation category. The total number of villages increases in 2015 as new village governments were created based on Census of India (2011) population measures.

Conditional on the reservation for the Gram Panchayat in an elec-

¹⁰For data from elections prior to 2005, a member of the UP State Legislative Assembly was able to provide me with data (on paper) from one administrative region that covers three electoral districts. This data is used in analyses presented in Section 2.5.4 where I estimate the effect of multiple reservations from 1995-2010 on election outcomes in 2015.

¹¹Due to the re-drawing of some electoral boundaries of certain districts between 2005 and 2010 and then 2010 and 2015, I have excluded these districts from the analysis as the village identification numbers used by the state may not be consistent across years.

¹²For the election in 2000, data was available for only 3 election districts and therefore the sample consists of only 1619 Gram Panchayats.

tion cycle, its reservation status is almost randomly assigned in the subsequent election. The "almost randomly" is necessary because first the share of Gram Panchayat positions that are reserved for SC (including SCW) and OBC (including OBCW) depends on the share of SC and OBC individuals in the district, and the likelihood that a post is reserved for any of these categories is related to the share of the population in a village that is SC or OBC, respectively. Villages with higher SC and OBC populations are more likely to be reserved for these categories. This is discussed in greater detail in Section 2.4. Given this, I also include some population based controls that come from the Census 2011.

The main estimation sample consists of approximately 4000 villages which were unreserved in 2005 and in 2015. The reason for restricting the sample to unreserved villages in 2015 is because these are the only elections where I can estimate a post-treatment effect of reservation. The restriction for unreserved villages in 2005 is due to the fact that these villages had as close to random assignment to the various reservation categories as is possible conditional on village population characteristics.¹³

2.4 Identification

The goal of this chapter is to estimate the effect of reservation for women in general, and lower-caste women specifically, on the political landscape of village elections. In particular, I want to investigate if reservation enables greater representation, even in its absence, and whether the changes can be attributed to the re-election of incumbents or broader changes in the candidate pool for these elections.

Across the country, when the first elections of Gram Panchayat Pradhans was held, the reservation of such positions for women was done randomly and this led to a wealth of research on the causal impact of female Pradhans starting with the seminal work by Chattopadhyay and Duflo (2004) studying villages in West Bengal. In UP, the first election was in

¹³As show in Figure 2.1 if a village was unreserved in 2005 is eligible for all reservation categories in 2015.

1995, but the election data for all Gram Panchayats is available from 2005. The rotating and conditional random assignment of GP posts to different reservation categories forms the basis of my identification strategy.

Figure 2.1 explains the mechanics of the reservation assignment and highlights how this can be used to estimate a treatment effect of reserving the post of Gram Pradhan (GP) in a village. Starting in 2005, the main sample for analysis is restricted to those villages that were unreserved. These villages are then split into three broad groups as shown in the picture. Conditional on population characteristics, namely villages with a higher share of OBC (or SC) individuals are given higher priority for reservation in groups B and C, respectively, villages are assigned to one of these three groups.¹⁴ Then, within each of these three groups, the law requires that at least one-third of the villages be reserved for women. Therefore, the villages in group A will be split such that one-third of those villages will be *randomly* assigned to the "Gen. Woman" reservation category. Similarly, in group B, one-third of the villages will be *randomly* assigned to "OBC Woman" and in group C, to "SC Woman". Thus, each pair of blue and yellow boxes represents a pair of control and treatment villages, respectively.

Restricting the sample to those villages that were unreserved in 2005 and 2015 allows for a clean estimate of the impact of reservation since population characteristics determine which group a village falls into and, within each group, the reservation for women is random. However, restricting the sample to those unreserved in 2005 and 2015 also reduces the sample size - for example in the cycles 2005 to 2015, where all village election data is available, the restricted sample is approximately 4300 villages (out of a potential fifty thousand). Furthermore, since the control group consists of villages that were unreserved for three consecutive election cycles, there may be concerns that these villages are different

¹⁴By restricting the initial group of villages to those that were unreserved in 2005, we so far do not need to pay attention to the rule that villages may not fall under the same reservation category for two consecutive election cycles as shown in Figure 2.1.

from other villages that have experienced at least one reservation and therefore do not form an appropriate control group. To speak to these concerns and take advantage of the available data, I also extend the analysis to include all villages that were unreserved in 2015, irrespective of their 2005 reservation status. This increases the number of villages studied from approximately 4000 to just under 16000. The identification strategy for this larger sample has to account for the change in conditional probability of reservation which is due to the fact that a village should not be reserved for the same caste or gender category in two consecutive election cycles¹⁵ (see Figure 2.1). This is an important part of the design of the programme for my identification and with the data that I have I can see that it is successfully implemented at least 95% of the time. In order to control for this difference in reservation probability that comes from a village's reservation status in the previous election, I include a series of dummy variables for each grouping of reservation categories in 2005. This implies an assumption that reservation in 2005 and 2010 has a linear additive effect. Further on in Section 2.5.4 I will present results where I relax this assumption.

In the next section, I present the estimating equations and the results of the analyses.

2.5 Estimation and Results

In this section, I present the estimating equations and the results of the effect of India's reservation policies in one election cycle on the subsequent election cycle. Since reservation in one election cycle is random conditional on the reservation in previous election cycle,¹⁶ I use this quasi-experimental setting to estimate the impact of exposure to a female Gram Pradhan in 2010, both in general and separately by caste-groups,

¹⁵For example, a village reserved for OBCW in 2005 cannot be reserved for either OBCW or OBC in 2010, but can be reserved for GW.

¹⁶The population composition of villages also plays a role in the likelihood that a village is reserved under a caste category. These effects are explicitly controlled for, as far as possible, using data from the 2011 Indian Census.

on the subsequent election, in this case the 2015 election (see Section 2.4 for more details).

For the cleanest estimation, I restrict the sample to those villages that were unreserved in 2005 and 2015 which results in sample of approximately 4400 villages.¹⁷ In addition, I also expand the sample to all villages that were unreserved in 2015 and include a series of dummy variables for their reservation category in 2005. This estimation strategy rests on an underlying assumption that the effects of reservation are additive in nature. In Section 2.B.1 I relax this assumption and explore the possibility of a non-linear relationship between reservation in 2005 and 2010 on election outcomes in 2015.

2.5.1 Election of Women Gram Pradhans

Reservation of the Gram Pradhan post for women in a given election year means that those villages are required to elect a woman as GP and exposes people to women in positions of leadership.¹⁸ I estimate the effect that this exposure through reservation has on the subsequent election of women without reservation, when the election is open to all eligible citizens.

In the first part of the analyses, following the existing literature, I pool the different sub-categories through which a village may be reserved for a woman GP together¹⁹ and estimate its impact on the likelihood that a woman is elected in an unreserved village in the next election. This measure of "treatment" is represented by the vector

¹⁷Three districts were created between the 2010 and 2015 election cycles. They were created by creating a new combination of existing sub-districts and their respective villages. Thus, these new districts were carved out of existing districts. This creates an issue in matching these villages with previous elections and so for the current analysis these have been excluded. The estimates presented in this section include within district effects and thus mitigate any concerns of biased estimates due to the exclusion of the new and changed districts.

¹⁸The impact of this exposure has been found to go beyond the direct effects of women on policy - Beaman et al. (2012) have shown that this reduces the bias against women Gram Pradhans (GPs) and increases the aspirations of teenage girls.

¹⁹There are three different types of reservation for women - General Woman, Other Backward Classes - Woman and Scheduled Caste - Woman.

*reservation_pooled*_{2010(i)} in Equation 2.1 below. The outcome, $y_{2015(i)}$ is a dummy that equals one if a woman is elected in village i in election year 2015.

$$y_{2015(i)} = \alpha + \beta * \text{reservation_pooled}_{2010(i)} + \gamma * X_i + \epsilon_i, \quad (2.1)$$

α represents the average share of women elected in 2015 in villages that have been unreserved every election cycle from 2005 to 2015. X_i is a vector of control variables which includes dummy variables for the other caste-based reservation categories and village demographics, namely, the total population, the share of SC individuals, the share of women, the share of literate individuals and the share of literate women. The results are presented in Table 2.2. In columns (1)-(3), the sample is restricted to those villages that were unreserved in 2005, as well as 2015. Columns (2) and (3) present results from the preferred specification as it includes controls for differences in village demographics which may affect caste-based reservation and though the estimate is positive, it is not statistically significant. In columns (4)-(5), I expand the sample to all villages that were unreserved in 2015, irrespective of their reservation status in 2005 and estimate a positive and statistically significant effect of reservation on the likelihood that a woman is elected. However, given that the programme design aims at ensuring that a village does not fall under the same reservation category for two consecutive cycles, villages that were not unreserved in 2005 do not have equal probability of being reserved for a given caste group. To account for this aspect of the programme design, a series of dummy variables is included for each reservation category in 2005. In this expanded sample, I am unable to control for village demographics but the estimates are very similar to those of column (2), giving me confidence. The results in Table 2.2 show that reservation for women, irrespective of caste, increases the likelihood of a woman being elected by 1.6 percentage points which corresponds to about a 10% increase. This can be seen in columns (4) and (5).

Table 2.2: Election of women as Gram Pradhan in 2015 following reservation for women (all sub-categories combined) in 2010

	Woman GP				
	(1)	(2)	(3)	(4)	(5)
Woman (combined) 2010	0.020 (0.016)	0.013 (0.017)	0.012 (0.017)	0.015* (0.008)	0.016** (0.008)
No. of Observations	4578	4342	4342	15779	15779
R-squared	0.001	0.014	0.037	0.001	0.024
Mean Dep. Var	0.159	0.159	0.159	0.163	0.163
Village Controls		✓	✓		
Reservation 2005				✓	✓
District FE			✓		✓

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Robust standard errors are reported in parentheses. The outcome variable is a dummy variable that equals 1 if a woman is elected Gram Pradhan in an unreserved village in 2015. The coefficients reported in the table are the effects of a village's reservation status in 2010 on the 2015 election outcomes. The two remaining reservation categories - OBC and SC - are included as controls in all columns. Columns (1), (2) are restricted to villages that were unreserved in 2005. Columns (3), (4) include all villages that were unreserved in 2015 and includes controls for their 2005 reservation category. Village controls are from the 2011 census and are - the total population, share of women, share of SC individuals, share of literate people and share of literate women. District fixed effects are included as indicated.

The estimates in Table 2.2 are a combined effect of reservation for women from three different categories - General Woman (GW), Other Backward Classes - Woman (OBCW), Scheduled Caste - Woman (SCW) - in 2010 on the likelihood that woman is elected GP in an unreserved village in 2015. This follows the existing literature on the impact of reservation for women in India in village elections which has abstracted from the caste-based effects and pooled all the types of reservation into a single treatment. However, related research done on Indian state legislatures has shown both the importance of caste-based reservations on the targeting of public finance towards their caste group (Pande, 2003) and that lower-caste women in particular are more effective at passing more female-centric legislation (Clots-Figueras, 2011). Therefore, I use the election data from Uttar Pradesh to separately estimate the effects of reservation in the "General Woman" (GW), "Scheduled Caste-Woman" (SCW), and "Other Backward Classes-Woman" (OBCW) cat-

egories.^{20,21} This allows me to explore whether specific types of reservation for women have differential effects on the probability of electing any woman in the next election cycle. The estimating equation is written below where $reservation_{2010(i)}$ represents a sum of dummies where each dummy represents one of the five reservation categories. This leaves "Unreserved" as the control group.²² The other variables in Equation 2.2 are the same as in Equation 2.1.

$$y_{2015(i)} = \alpha + \beta * reservation_{2010(i)} + \gamma * X_i + \epsilon_i. \quad (2.2)$$

²⁰A more detailed explanation of how reservation is implemented for each of these categories is presented in the following sections: Reservation and Identification.

²¹The categories "Scheduled Tribe" (ST) and "Scheduled Tribe-Woman" (STW) are not included in the analysis because in Uttar Pradesh approximately 0.35% and 0.2% are reserved for each of these categories, respectively, and when the sample is restricted to UR villages in 2015, 1 village was reserved for ST in 2010 and none for STW.

²²Aside from "Unreserved" village may fall into one of five different reservation categories - General Woman, Other Backward Classes, Other Backward Classes Woman, Scheduled Caste, Scheduled Caste Woman.

Table 2.3: Election of women as Gram Pradhan in 2015 following reservation for women in 2010

	Woman GP				
	(1)	(2)	(3)	(4)	(5)
Gen. Woman 2010	0.039** (0.019)	0.029 (0.020)	0.028 (0.020)	0.025** (0.010)	0.022** (0.010)
OBC Woman 2010	0.013 (0.020)	0.008 (0.021)	0.007 (0.021)	0.024** (0.011)	0.026** (0.011)
SC Woman 2010	-0.007 (0.021)	-0.011 (0.022)	-0.014 (0.022)	-0.009 (0.011)	-0.005 (0.011)
No. of Observations	4578	4342	4342	15779	15779
R-squared	0.002	0.015	0.038	0.002	0.024
H ₀ :OBC=OBCW	0.350	0.395	0.390	0.009	0.009
Mean Dep. Var	0.159	0.158	0.159	0.163	0.163
Village Controls		✓	✓		
District FE			✓		✓
Reservation 2005				✓	✓

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Robust standard errors are reported in parentheses. The outcome variable is a dummy variable that equals 1 if a woman is elected Gram Pradhan in an unreserved village in 2015. The coefficients reported in the table are the effects of a village's reservation status in 2010 on the 2015 election outcomes. The two remaining reservation categories - OBC and SC - are included as controls in all columns. Columns (1), (2) are restricted to villages that were unreserved in 2005. Columns (3), (4) include all villages that were unreserved in 2015 and includes controls for their 2005 reservation category. Village controls are from the 2011 census and are - the total population, share of women, share of SC individuals, share of literate people and share of literate women. District fixed effects are included as indicated.

When splitting the combined effect to look at the effects of each reservation category separately, General Woman (GW) and Other Backward Classes Woman (OBCW)²³ have the strongest effects on women GP's election probabilities (see columns (4)-(5) in Table 2.3). Similar to the earlier table, in columns (1)-(3) the sample is restricted to villages that are unreserved in 2005 and 2015, whereas columns (4) and (5) in-

²³OBC stands for Other Backward Class and is a group of sub-caste groups who are disadvantaged and, as a result, are under-represented in numerous professions including local governance. The list of sub castes (or "jatis") that qualify as OBC according to the law differs from state to state.

clude an expanded sample of unreserved villages in 2015 and a series of dummy variables to control for 2005 reservation categories. Columns (2)-(3) have the preferred specification. The coefficients are positive but are not statistically significant.

Given these results and Clots-Figueras (2011)'s work on the effectiveness of lower-caste women in the State Legislature, I look at the effects of lower-caste women, specifically OBC women, separately. The results are presented in 2.4. Using the same estimation strategy as in Equation 2.2, I estimate the effect of reservation on the likelihood that an OBC individual is elected first and next, on the likelihood that an OBC woman is elected. I find that there is a positive effect of reservation on the representation of OBC individuals (see Table A4) which seems to be driven by the positive effect on the election of OBC women who are the main focus here.²⁴

²⁴In Table A4 I present results on the likelihood that an OBC individual is elected, and interestingly it appears to be the OBC women who are driving the positive effects of representation of OBCs

Table 2.4: Election of OBC women as Gram Pradhan in 2015 following reservation for women in 2010

	OBC Woman GP				
	(1)	(2)	(3)	(4)	(5)
Gen. Woman 2010	0.011 (0.009)	0.008 (0.009)	0.005 (0.009)	0.005 (0.006)	0.004 (0.006)
OBC Woman 2010	0.031*** (0.011)	0.029** (0.011)	0.027** (0.011)	0.026*** (0.007)	0.026*** (0.007)
SC Woman 2010	-0.002 (0.009)	-0.004 (0.010)	-0.010 (0.010)	0.006 (0.007)	0.006 (0.007)
No. of Observations	4578	4342	4342	15779	15779
R-squared	0.003	0.008	0.029	0.006	0.020
H ₀ :OBC=OBCW	0.007	0.012	0.014	0.001	0.003
Mean Dep. Var	0.033	0.034	0.034	0.048	0.048
Village Controls		✓	✓		
District FE			✓		✓
Reservation 2005				✓	✓

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Robust standard errors are reported in parentheses. The outcome variable is a dummy variable that equals 1 if an OBC woman is elected Gram Pradhan in an unreserved village in 2015. The coefficients reported in the table are the effects of a village's reservation status in 2010 on the 2015 election outcomes. The two remaining reservation categories - OBC and SC - are included as controls in all columns. Columns (1)-(3) are restricted to villages that were unreserved in 2005. Columns (4)-(5) includes all villages that were unreserved in 2015 and includes controls for their 2005 reservation category. Village controls are from the 2011 census and are - the total population, share of women, share of SC individuals, share of literate people and share of literate women. District fixed effects are included as indicated.

Across all specifications, reservation for OBC women consistently has a positive and statistically significant effect on the likelihood that an OBC woman is elected in the next election in an unreserved village. While the estimated increase in probability of 3 percentage points may seem quite small, the effects are substantial when comparing it to the share of unreserved villages with an OBC woman GP. In columns (1)-(3), the sample is restricted to villages that were unreserved in 2005 and 2015, and after including controls for village demographics, I find that reserving villages for OBCWs resulted in an 80% increase in the share of OBCW GPs in unreserved villages (see columns (2)-(3)). Following the same strategy as before, I expand the sample in columns (4)-(5)

to villages that were unreserved in 2015 but include a series of dummy variables for the reservation categories in 2005. I find that the estimate remains very stable.

It is worth keeping in mind that while the OBCW reservation is a completely random subset of those villages reserved for OBC individuals, the likelihood that a village is reserved for OBC or OBCW is affected by the share of OBC individuals in the village. Villages with larger shares of OBC individuals are more likely to be reserved for OBC (and OBCW) as they are given higher priority for this reservation category. This is conditional on not falling into either of these reservation categories in the previous election cycle. At the same time, the census does not report the share of OBC individuals in a village, thus, it is not possible to directly control for this.²⁵ However, relative to the OBC reservation, the coefficient on OBCW can be interpreted as a causal effect as one-third of the villages that should be reserved for OBC are randomly assigned to be OBCW (Table A2). In Table 2.4, and therefore, in all analyses that pertain to OBCW, I present p-values that test the difference between the OBC and OBCW coefficients.

Overall, I find that reservation for women increases the likelihood that a woman is elected in the next election cycle. When pooling the different reservation categories for women together, I find that, on average, reservation for women increases the likelihood that a woman is elected by 10%. Moreover, when I analyse the different types of reservation categories separately, I find that the effects are particularly striking for OBC women. Reserving a Gram Pradhan post for OBCW results in an almost doubling in the probability that an OBC woman is elected in the next election cycle. This may be for a number of reasons. First, it is possible that OBC women are more effective in the role of GP as compared to higher caste women who are more likely to be elected in the GW category. If village level politics is comparable to that of In-

²⁵Caste related issues are a very sensitive topic in India, both politically and socially and the central government has yet to include an official count of OBC individuals in the census.

dian state legislatures, then these effects would be in line with those reported by Clots-Figueras (2011) that lower-caste women advocate for more pro-female policies in state legislatures. Second, given that lower-caste women in India have been documented to have greater freedoms (Field et al., 2010), OBC women may have greater opportunities to fulfil their roles of GP compared to the higher caste women elected in the GW. A third reason could be that women elected in the GW category may be more likely to be the female relatives of past GPs elected without reservation and might therefore simply be figureheads. Since OBC individuals are traditionally from a marginalised and under-represented background, the likelihood that an OBC woman is a female relative of a powerful village elder and therefore simply a figurehead, is possibly less likely.²⁶

2.5.2 Incumbency

In this subsection, I study the role of re-election of incumbents as the channel through which reservation increases the representation of women, and OBC women, in particular, in unreserved GP posts. I restrict the analyses to villages that were unreserved in both 2005 and 2015.

The upper panel of Figure 2.3 shows the share of GPs in 2010 who competed in the next election, 2015, by reservation category. The first thing worth noticing is that unreserved GPs are far and away the most likely to stand for elections in the next cycle. In comparison, on average fewer than one in five women GPs elected through reservation, irrespective of caste, compete in the next election cycles - this can be seen in the GW and OBCW reservation categories where approximately 18% of incumbents compete in the next election if the post is unreserved, and the same is true for about 14% of SCW GPs. Incumbents from caste-based reservation without a gender component, namely OBC and SC, are more likely to compete in the next election than those caste-based

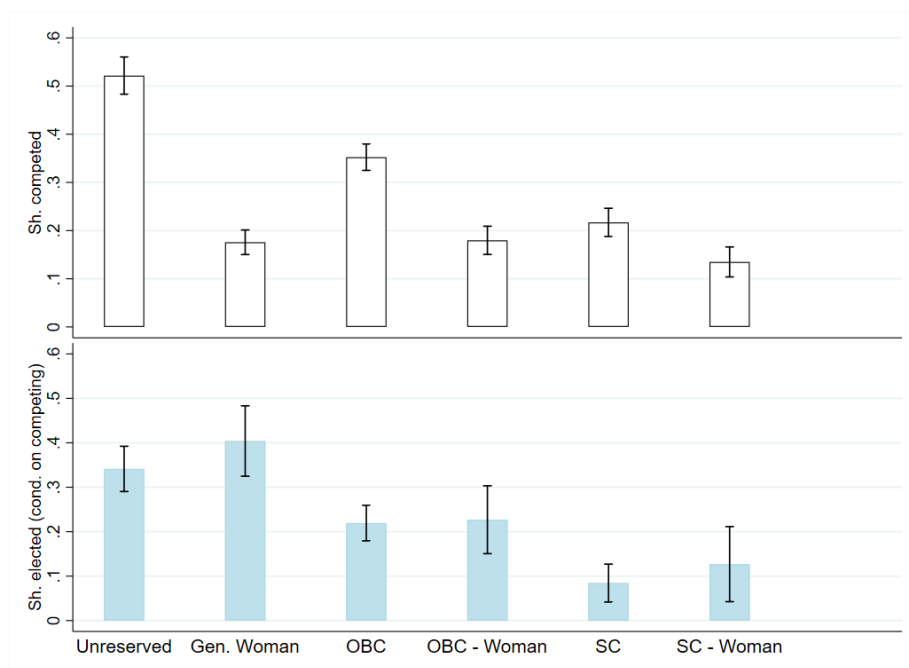
²⁶The effect of SC women while positive and significant, is small and is indicative of the under-representation of SC individuals in governance. These results are presented in Table A3.

reservations with a gender component. This means that, overall, male incumbents are more likely to run than female incumbents.

However, a different pattern emerges when focusing on electoral success conditional on competing. This is shown in the lower panel of Figure 2.3 where the sample is restricted to villages where an incumbent was a candidate in the next election and the y-axis shows the share of these incumbents who were re-elected. Most noticeably, GPs elected in the General Woman (GW) category are as successful at getting re-elected as unreserved GPs. Additionally, now caste and gender based reservation, OBCW and SCW, incumbents perform the same as the incumbents from only caste-based reservation (OBC and SC). The high levels of electoral success rates in combination with the low rates of incumbents competing in the next election, especially in the GW reservation category, suggest that there is some positive selection among the incumbents who choose to compete. It also indicates that the positive effect of the GW category on the likelihood of electing a woman in the next election might, at least partially, be driven by the re-election of incumbents. This result provides suggestive evidence that the criticism that reservation only increases the descriptive representation of women and that those elected through reservation are mere figure-heads may not necessarily be the case.

At the same time, incumbent OBCW GPs have very limited success in being re-elected but it is similar to that of OBCs suggesting the salience of caste rather than gender. Moreover, these results indicate that the increase in OBCW GPs seen in Table 2.4 is not due to re-elected incumbents but instead may be driven by an increase in the quantity and/or quality of OBCW candidates. Furthermore, in line with Beaman et al. (2012) reports a reduction in the bias against women GPs following reservation, exposure to OBCW as leaders through reservation may also have led to a reduction in the overall level of bias against them creating opportunities for other OBC women to get elected. I explore these potential effects on the candidate pool in the next subsection.

Figure 2.3: *The selection and re-election of incumbents in different reservation categories*



Note: The upper panel shows the share of incumbents in 2010 who were candidates in the election in 2015 by reservation category in 2010. The sample in this case is restricted to villages that were unreserved in 2005 and 2015. The lower panel shows the share of incumbents from 2010 by reservation category who were successfully re-elected conditional on competing in the election.

2.5.3 Pool of Candidates

The results thus far highlight that incumbency advantage is, at most, only part of the story when looking at the election of women following reservation, especially since lower-caste women GPs, specifically OBC women incumbents, are very unlikely to be re-elected. In this subsection, I explore changes in the candidate pool in the election following reser-

vation.²⁷ In order to do this, I use data on the list of candidates in the 2015 election cycle covering a total of approximately 55000 villages.

The estimating equation is the same as Equation 2.2. The vector $reservation_{2010(i)}$ captures the effects of reservation in 2010 on a series of outcomes, $y_{2015(i)}$, that are village level characteristics of the pool of candidates in the 2015 election such as the total number of candidates, and the share of women candidates. As in the previous estimation, when studying all 2015 unreserved villages, the vector $reservation_{2005(i)}$ is included to capture the differences in conditional probability of a village being reserved under the different categories in 2010 when the sample is not restricted to those unreserved in 2005.

As I study a variety of possible changes in the candidate pool ranging from measures of the number of candidates of different types, to the quality of candidates as measured by literacy, I present the results in two tables. Table 2.5 presents the first part of the analysis below where I study the impact of reservation on the total number of categories and the number of different "types" of candidates. In columns (1)-(2), $y_{2015(i)}$ is the total number of candidates who competed in unreserved villages that were unreserved in 2005 and 2015 whereas column (3) is all villages that were unreserved in 2015. Interestingly, following all types of caste-based reservation, there is an increase in the total number of candidates.²⁸ Furthermore, focusing on the impact of the OBCW reservation which significantly increases the likelihood of an OBC woman being elected, I find that there is an increase in the number of OBC women candidates which corresponds to an approximately 20% increase in the proportion of OBC women candidates (column (12)). While the effects are very small in absolute terms, the average number of women candidates in unreserved villages is 1.3, and that of OBC women is less than 1 (0.4), in relative terms these effects may correspond to meaningful increases.²⁹

²⁷This means that in the previous election cycle, the post of GP was reserved and in the upcoming election cycle it will be unreserved.

²⁸For the coefficients for the estimates on the OBC and SC reservations please see Table A5.

²⁹Table A5 presents the coefficients for the other two reservation categories as well,

SC, and OBC. Interestingly, SC reservation also results in an increase of OBC women candidates which is indicative of some overlap effects across caste lines.

Table 2.5: *The number of candidates in the 2015 election in unreserved villages following reservation in 2010*

	Total			Women			Sh. Women			Sh. OBC Women		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Woman (combined) 2010	0.795*** (0.168)			0.051 (0.077)			-0.007 (0.010)			0.001 (0.005)		
Gen. Woman 2010		0.289 (0.192)	0.024 (0.096)		-0.007 (0.087)	-0.027 (0.040)		-0.004 (0.012)	-0.003 (0.005)		-0.003 (0.006)	-0.000 (0.003)
OBC Woman 2010		0.957*** (0.217)	0.761*** (0.105)		0.078 (0.096)	0.171*** (0.044)		-0.008 (0.012)	0.005 (0.006)		0.010 (0.007)	0.011*** (0.004)
SC Woman 2010		1.521*** (0.241)	1.554*** (0.116)		0.123 (0.110)	0.244*** (0.051)		-0.010 (0.013)	-0.004 (0.006)		-0.003 (0.007)	-0.001 (0.004)
No. of Observations	4342	4342	15779	4342	4342	15779	4342	4342	15779	4342	4342	15779
R-squared	0.081	0.088	0.140	0.050	0.051	0.111	0.032	0.032	0.064	0.005	0.006	0.057
H ₀ :OBC=OBCW		0.145	0.079		0.189	0.000		0.230	0.000		0.001	0.000
Mean Dep. Var	7.754	7.754	7.843	1.379	1.379	1.351	0.177	0.177	0.172	0.042	0.042	0.052
Village Controls	✓	✓		✓	✓		✓	✓		✓	✓	
District FE			✓			✓			✓			✓
Reservation 2005			✓			✓						✓

***, **, * indicate significance at the 1%, 5%, and 10% levels respectively. Robust standard errors are reported in parentheses. The sample is restricted to those villages that were unreserved in 2005 and 2015 in odd numbered columns and the sample is restricted to villages that were unreserved in 2015 in the even numbered columns. The estimated effects are of the reservation category in 2010. The two remaining reservation categories - OBC and SC - are included as controls in all columns. Outcome variables are indicated in the column headers and refer to the total number of candidates, number of female candidates, proportion of female candidates, number of female OBC candidates, and proportion of female OBC candidates. Village controls are from the 2011 census and are -the total population, the share of women, share of SC individuals, share of SC individuals, share of SC individuals, and share of SC individuals. District fixed effects are included as indicated. The proportions are relative to the total number of candidates.

Following reservation, in addition to an increase in the total number of candidates, I also find evidence of an increase in the quality of candidates as measured by literacy. It is worth noting that literacy is non-trivial in this setting where the adult female literacy rate is around 48% Census of India (2011). Using the same estimation strategy, I estimate the effect of reservation in 2010 on the quality of candidates in 2015. The results are shown in Table 2.6 where the first two columns of each outcome variable are the estimates from villages that were unreserved in both 2005 and 2015, and the third column expands the sample to all villages that were unreserved in 2015, controlling for their 2005 reservation.

The first thing to note in columns (2)-(3) is that following all caste-based reservation categories, there is an increase in the number of literate candidates (see columns (2)-(3) of Table A6 for coefficients on OBC and SC reservation). Villages that become unreserved after reservation for OBCW (SCW) have an associated increase of more than 15% (25%) in the number of literate candidates. Interestingly, the effect is both on the number of literate male and female candidates, though that on men is slightly larger and the estimate is more stable (see columns (5)-(6)). This, in turn, translates into an increase in the share of literate candidates by about 2 percentage points (4.1 percentage points) for OBCW (SCW) reservation (see column (12)). This means that following reservation for lower caste women, there is a measurable increase in the quality of all candidates including the men. Finally, in terms of representation, there is also a very small but significant increase in the proportion of literate OBC women (see column (15)).

Table 2.6: *The quality (as measured by literacy) of candidates in the 2015 election in unreserved villages following reservation in 2010*

	Total Lit.			No. Lit. Men			No. Lit. Women			Sh. Literate			Sh. Lit. OBC Women		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Woman (combined) 2010	0.799*** (0.159)			0.743*** (0.145)			0.055 (0.060)			0.034*** (0.009)			0.000 (0.004)		
Gen. Woman 2010		0.263 (0.180)	0.024 (0.091)		0.295* (0.164)	0.065 (0.083)		-0.032 (0.066)	-0.041 (0.032)		0.014 (0.010)	0.001 (0.004)		-0.003 (0.004)	-0.001 (0.002)
OBC Woman 2010		0.973*** (0.204)	0.722*** (0.100)		0.876*** (0.185)	0.589*** (0.091)		0.097 (0.075)	0.134*** (0.036)		0.042*** (0.010)	0.021*** (0.004)		0.005 (0.005)	0.006** (0.003)
SC Woman 2010		1.563*** (0.230)	1.511*** (0.110)		1.403*** (0.215)	1.265*** (0.101)		0.161* (0.089)	0.245*** (0.041)		0.061*** (0.010)	0.040*** (0.004)		-0.001 (0.005)	0.002 (0.003)
No. of Observations	4342	4342	15779	4342	4342	15779	4342	4342	15779	4342	4342	15779	4342	4342	15779
R-squared	0.075	0.083	0.134	0.070	0.077	0.127	0.024	0.026	0.065	0.041	0.046	0.150	0.003	0.003	0.050
H ₀ :OBC=OBCW		0.047	0.081		0.116	0.542		0.115	0.001		0.075	0.192		0.016	0.001
Mean Dep. Var	6.155	6.155	6.288	5.193	5.193	5.341	0.962	0.962	0.947	0.758	0.758	0.765	0.029	0.029	0.036
Village Controls	✓			✓	✓		✓	✓		✓	✓		✓	✓	
District FE			✓			✓			✓			✓			✓
Reservation 2005			✓			✓			✓			✓			✓

***, **, * indicate significance at the 1%, 5%, and 10% levels respectively. Robust standard errors are reported in parentheses. The sample is restricted to those villages that were unreserved in 2005 and 2015 in odd numbered columns and the sample is restricted to villages that were unreserved in 2015 in the even numbered columns. The estimated effects are of the reservation category in 2010. The two remaining reservation categories - OBC and SC - are included as controls in all columns. Outcome variables are indicated in the column headers and refer to the total number of literate candidates, number of literate male candidates, number of literate female candidates, share of literate candidates, share of literate female OBC candidates. Village controls are from the 2011 census and are -the total population, the share of women, share of SC individuals, share of literate people and share of literate women. District fixed effects are included as indicated. The proportions are relative to the total number of candidates.

The rotation of different villages' GP positions across different reservation categories creates a disruption in who is eligible to compete in the elections. When a village becomes reserved after having been unreserved, it restricts certain incumbents from competing in the next election; however, when the opposite occurs, it creates an opportunity for reserved GPs, who may not have been elected otherwise to compete in an election as incumbents. Even though GPs elected in reserved positions are much less likely to compete in the subsequent unreserved election, women elected through GW reservation, conditional on running for election, are no less likely than any unreserved incumbent to be elected. The "removal" of reservation also opens up electoral competition. The positive effects on the quality of men competing speaks directly to Besley et al. (2017) where promoting representation of women leads to more competent men competing in elections, though the mechanism is different as there is nothing to prevent less qualified male candidates from competing as well, unlike in Swedish case with party lists. In the latter case, when the policy to fill alternative positions on the list with female candidates, the number of available positions for male candidates is halved and there is a clear rationale for prioritising more qualified male candidates. In the GP elections, there is no restriction on the maximum number of candidates and the entry cost is a nominal administrative fee so the driving force behind the increase in the quality of male candidates is somewhat less straightforward. One interpretation could be that following reservation, it is higher caste men, who are more likely to be literate, choosing to compete as they were unable to do so when the post was reserved. However, the positive effects, although somewhat weaker, on the share of literate women candidates, and in particular on the share of literate OBC (SC) women candidates, alleviate this concern. In fact, it suggests that reservation may have a role model effect where individuals, having seen someone from the same background successfully fill the position, are more likely to compete in the elections even when it is unreserved. Overall, these results show that reservation has greater ripple effects than only increasing representation when it is in effect in a village.

2.5.4 Reservation Across Multiple Cycles

The results presented thus far focus on the impact of reservation in 2010 on the elections in 2015 with two assumptions. The first assumption is that the effects of reservation in 2005 and 2010 are linear and additive and the second is that reservations for women prior to 2005 do not affect outcomes in 2015. In this last subsection I will relax both of these assumptions subject to data constraints.

Relaxing the assumption of the linearly additive relationship between reservation in 2005 and 2010, I include a series of dummy variables for each reservation category in 2005 and 2010 as well as interactions between them. The outcome variable is if a woman is elected GP in 2015 in an unreserved villages. The results are presented in Section 2.B.1 in the appendix. I do not find any evidence of reservation in 2005 and 2010 having a non-additive effect. Instead, consistent with previous results, I find evidence that villages that were reserved for "General Woman" in 2010 have a higher likelihood of electing a woman in 2015. Additionally, I find evidence that villages that were reserved for "General Woman" in 2005 have a similarly positive effect on the likelihood of electing a woman in 2015 however this latter effect should be interpreted with caution as I am unable to control for reservation prior to 2005 for all villages.

Prior to 2005, I have reservation data that covers three districts in Uttar Pradesh. In order to further relax the additive assumption and account for reservation histories of villages prior to 2005, I pool all three types of reservation for women - "General Woman", "Other Backward Classes - Woman", and "Scheduled Caste - Woman" - and estimate the effect of a village being reserved for a woman just once, twice or three times in different election cycles. I do not differentiate between consecutive and non-consecutive election cycles in order to estimate the overall effect of the number of reservations on the likelihood that a woman is elected in an unreserved village in 2015. The estimating equation is written below:

$$y_{2015(i)} = \alpha + \beta_1 * reserved_1 + \beta_2 * reserved_2 + \beta_3 * reserved_3 + \gamma * X_i + \epsilon_i. \quad (2.3)$$

where j in $reserved_j$ refers to the number of times, between zero and three, that a village has been reserved for a woman across the four election cycles starting in 1995 and ending in 2010. β_j captures the effect of the GP post being reserved for a woman j times. The matrix X_i has a series of dummy variables for when a village's reservation history includes another reservation category. For example, if a village was reserved for "Scheduled Caste" in 1995 and then unreserved for every cycle since then, this would be accounted for in X_i . The control group of villages are those that have been unreserved in every election cycle. The results can be seen in Table 2.7 below.

Table 2.7: *Election of women as Gram Pradhan in 2015 following reservation for women (all sub-categories combined) multiple times between 1995 and 2010*

	Woman GP	
	(1)	(2)
Reserved for Woman (Combined) - 1 time	0.007 (0.008)	0.061* (0.036)
Reserved for Woman (Combined) - 2 times	0.021** (0.009)	0.068 (0.045)
Reserved for Woman (Combined) - 3 times		0.126 (0.095)
No. of Observations	15780	564
R-squared	0.001	0.013
Mean Dep. Var	0.165	0.099
Other reservation categories in 2005 and 2010	✓	✓
Other reservation categories in 1995 and 2000		✓

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Robust standard errors are reported in parentheses. The outcome variable is a dummy variable that equals 1 if a woman is elected Gram Pradhan in an unreserved village in 2015. The coefficients reported in the table are the effects of the number of times a village is reserved for a woman Gram Pradhan (as "General Woman", "Other Backward Classes - Woman" and "Scheduled Caste - Woman" combined). Columns (1) includes all villages that were unreserved in 2015 and controls for "Scheduled Caste" and "Other Backward Classes" reservation categories in 2005 and 2010. Columns (2) restricts the sample to villages that were unreserved in 2015 and for which reservation data for 1995 and 2000 was available and includes the "Scheduled Caste" and "Other Backward Classes" reservation categories for all years from 1995 - 2010.

The estimated coefficients suggest that the effect of reservation on the likelihood that a woman is elected may accumulate, but the effect is not very clear. In column (1), I use reservation data from 2005 to 2015 and include controls for other caste-based reservation categories in 2005 and 2010. In column (2), the sample is restricted to the villages for which data for the elections in 1995 and 2000 was available and includes controls for other caste-based reservation categories for all election years from 1995 till 2010. While column (1) shows that the GP position being reserved for women twice has a larger and more positive effect than its being reserved just once, the same cannot be seen in column (2). The difference in the coefficients of "Reserved for Women (Combined) - 2 times" between columns (1) and (2) suggest that the effect of reservation for women for

multiple cycles has a stronger effect when the cycles are consecutive. This can be inferred from the fact that in column (1) a village can only be reserved for women twice if it happens in consecutive election cycles whereas in column (2) there are multiple ways in which this may happen since it covers reservations from 1995-2010. Furthermore, in column (3), the effect of being reserved three times is double the size of the other two coefficients although the estimate is quite noisy and the estimate for being reserved once is large and statistically significant. Taken together, the results here point to the importance of the effect of a village being reserved for women at least once and suggest that there may be greater gains if it is reserved multiple times.

2.6 Conclusion

In this chapter, I find evidence that the reservation of political posts for women does lead to an increase in the representation of women in local government outside of its mechanical effect by increasing the likelihood that a woman is elected in the next election cycle without the help of reservation. These effects are most noticeable for OBC women, highlighting the fact that these effects are impacted by caste in addition to gender.

Moreover, while incumbent women from reserved villages are less likely to compete, conditional on choosing to compete, women GPs from "General Woman" reserved posts, without any caste restrictions, are no less likely than their unreserved counterparts to be re-elected. However, the same is not true for lower-caste women, both OBC and SC women are still less likely to be re-elected, even conditional on competing. Thus, the re-election of incumbents in the greater representation of lower-caste women in unreserved villages is, at best, a limited part of the story.

When a reserved GP position becomes unreserved, I find that there are substantial changes in the candidate pool, in particular there is an overall increase in the number of candidates and an increase in the quality, as measured by literacy, of the pool of candidates including men.

Furthermore, OBC women are more likely to compete in an unreserved village following reservation for OBC women, indicating that the reduction of the bias against such individuals and perhaps greater aspirations as documented by Beaman et al. (2012), may be more likely mechanisms for the increased likelihood in the election of OBC women after reservation.

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Appendices

2.A Coefficients for All Reservation Categories

Table A1: Election of women as Gram Pradhan in 2015 following reservation for women in 2010

	Woman GP				
	(1)	(2)	(3)	(4)	(5)
Gen. Woman 2010	0.039** (0.019)	0.029 (0.020)	0.028 (0.020)	0.025** (0.010)	0.022** (0.010)
OBC Woman 2010	0.013 (0.020)	0.008 (0.021)	0.007 (0.021)	0.024** (0.011)	0.026** (0.011)
OBC 2010	-0.003 (0.017)	-0.007 (0.018)	-0.009 (0.018)	-0.005 (0.009)	-0.003 (0.009)
SC Woman 2010	-0.007 (0.021)	-0.011 (0.022)	-0.014 (0.022)	-0.009 (0.011)	-0.005 (0.011)
SC 2010	0.015 (0.019)	0.016 (0.020)	0.017 (0.020)	-0.013 (0.009)	-0.006 (0.009)
No. of Observations	4578	4342	4342	15779	15779
R-squared	0.002	0.015	0.038	0.002	0.024
Mean Dep. Var	0.159	0.158	0.158	0.165	0.165
Village Controls		✓	✓		
Reservation 2005				✓	✓
District FE			✓		✓

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Robust standard errors are reported in parentheses. Columns (1) - (3) the outcome variable is a dummy equal to 1 if a woman is elected Gram Pradhan in an unreserved village in 2010. Columns (4) - (7) the outcome variable is a dummy equal to 1 if a woman is elected Gram Pradhan in an unreserved village in 2015. The coefficients reported in the table are the effects of a village's reservation status in 2005, or 2010, as labelled. Sample restrictions to unreserved villages in the election cycle prior to treatment (reservation) is as indicated. Controls for demographics (share of SC individuals, share of female individuals, total population, and share of literate female population), district fixed effects and reservation in previous election cycle prior to treatment (reservation) when using larger sample are as indicated.

Table A2: Election of OBC women as Gram Pradhan in 2015 following reservation for women in 2010

	OBC Woman				
	(1)	(2)	(3)	(4)	(5)
Gen. Woman 2010	0.011 (0.009)	0.008 (0.009)	0.005 (0.009)	0.005 (0.006)	0.004 (0.006)
OBC Woman 2010	0.031*** (0.011)	0.029** (0.011)	0.027** (0.011)	0.026*** (0.007)	0.026*** (0.007)
OBC 2010	0.004 (0.008)	0.002 (0.008)	0.001 (0.008)	0.004 (0.005)	0.006 (0.005)
SC Woman 2010	-0.002 (0.009)	-0.004 (0.010)	-0.010 (0.010)	0.006 (0.007)	0.006 (0.007)
SC 2010	0.017* (0.009)	0.018* (0.010)	0.015 (0.010)	-0.002 (0.005)	-0.001 (0.005)
No. of Observations	4578	4342	4342	15779	15779
R-squared	0.003	0.008	0.029	0.006	0.020
H ₀ :OBC=OBCW	0.007	0.012	0.014	0.001	0.003
Mean Dep. Var	0.033	0.034	0.034	0.048	0.048
Village Controls		✓	✓		
District FE			✓		✓
Reservation 2005				✓	✓
Reservation Before 2005					

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Robust standard errors are reported in parentheses. Columns (1) - (3) the outcome variable is a dummy equal to 1 if an OBC woman is elected Gram Pradhan in an unreserved village in 2010. Columns (4) - (7) the outcome variable is a dummy equal to 1 if an OBC woman is elected Gram Pradhan in an unreserved village in 2015. The coefficients reported in the table are the effects of a village's reservation status in 2005, or 2010, as labelled. Sample restrictions to unreserved villages in the election cycle prior to treatment (reservation) is as indicated. Controls for demographics (share of SC individuals, share of female individuals, total population, and share of literate female population), district fixed effects and reservation in previous election cycle prior to treatment (reservation) when using larger sample are as indicated.

Table A3: Election of SC women as Gram Pradhan in 2015 following reservation for women in 2010

	SC Woman				
	(1)	(2)	(3)	(4)	(5)
Gen. Woman 2010	0.004 (0.004)	0.004 (0.004)	0.004 (0.004)	-0.000 (0.002)	-0.000 (0.002)
OBC Woman 2010	0.001 (0.003)	0.000 (0.003)	0.000 (0.004)	0.002 (0.002)	0.001 (0.002)
OBC 2010	0.003 (0.003)	0.002 (0.003)	0.002 (0.003)	0.004* (0.002)	0.004 (0.002)
SC Woman 2010	0.010* (0.006)	0.009 (0.006)	0.008 (0.006)	0.008*** (0.003)	0.007** (0.003)
SC 2010	0.001 (0.003)	0.000 (0.003)	-0.001 (0.004)	0.001 (0.002)	0.001 (0.002)
No. of Observations	4578	4342	4342	15779	15779
R-squared	0.001	0.005	0.016	0.001	0.007
H ₀ :SC=SCW	0.116	0.129	0.157	0.031	0.044
Mean Dep. Var	0.006	0.006	0.006	0.007	0.007
Village Controls		✓	✓		
Reservation 2005			✓		✓

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Robust standard errors are reported in parentheses. Columns (1) - (3) the outcome variable is a dummy equal to 1 if an SC woman is elected Gram Pradhan in an unreserved village in 2010. Columns (4) - (7) the outcome variable is a dummy equal to 1 if an SC woman is elected Gram Pradhan in an unreserved village in 2015. The coefficients reported in the table are the effects of a village's reservation status in 2005, or 2010, as labelled. Sample restrictions to unreserved villages in the election cycle prior to treatment (reservation) is as indicated. Controls for demographics (share of SC individuals, share of female individuals, total population, and share of literate female population), district fixed effects and reservation in previous election cycle prior to treatment (reservation) when using larger sample are as indicated.

Table A4: Election of OBC individuals as Gram Pradhan in 2015 following reservation for women in 2010

	OBC					
	(1)	(2)	(3)	(4)	(5)	(6)
Gen. Woman 2010	0.005 (0.021)	0.006 (0.021)	0.000 (0.021)	-0.014 (0.012)	-0.012 (0.011)	0.024 (0.060)
OBC Woman 2010	0.097*** (0.023)	0.085*** (0.024)	0.078*** (0.024)	0.074*** (0.013)	0.069*** (0.013)	0.128* (0.073)
OBC 2010	0.015 (0.019)	0.016 (0.020)	0.014 (0.020)	0.012 (0.011)	0.018 (0.011)	0.141** (0.055)
SC Woman 2010	0.059** (0.025)	0.051* (0.026)	0.027 (0.026)	0.038*** (0.014)	0.029** (0.013)	0.100 (0.070)
SC 2010	0.042* (0.022)	0.041* (0.022)	0.023 (0.022)	0.026** (0.012)	0.019* (0.011)	0.144*** (0.054)
No. of Observations	4578	4342	4342	15779	15779	560
R-squared	0.006	0.012	0.072	0.034	0.095	0.252
H ₀ :OBC=OBCW	0.000	0.001	0.003	0.000	0.000	0.866
Mean Dep. Var	0.223	0.224	0.224	0.303	0.303	0.343
Village Controls		✓	✓			
Reservation 2005				✓	✓	✓
District FE			✓		✓	✓
Reservation Before 2005						✓

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Robust standard errors are reported in parentheses. Columns (1) - (3) the outcome variable is a dummy equal to 1 if an OBC woman is elected Gram Pradhan in an unreserved village in 2010. Columns (4) - (7) the outcome variable is a dummy equal to 1 if an OBC woman is elected Gram Pradhan in an unreserved village in 2015. The coefficients reported in the table are the effects of a village's reservation status in 2005, or 2010, as labelled. Sample restrictions to unreserved villages in the election cycle prior to treatment (reservation) is as indicated. Controls for demographics (share of SC individuals, share of female individuals, total population, and share of literate female population), district fixed effects and reservation in previous election cycle prior to treatment (reservation) when using larger sample are as indicated.

Table A5: *The number of candidates in the 2015 election in unreserved villages following reservation in 2010*

	Total			Women			Sh. Women			Num. SC Women			Sh. OBC Women			Sh. SC Women		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Gen. Woman 2010	0.289 (0.192)	0.024 (0.096)	-0.007 (0.087)	-0.027 (0.040)	-0.004 (0.012)	-0.003 (0.005)	0.010 (0.041)	0.004 (0.023)	0.008 (0.016)	-0.009 (0.009)	-0.003 (0.006)	-0.003 (0.003)	0.001 (0.002)	-0.001 (0.001)				
OBC Woman 2010	0.957*** (0.217)	0.761*** (0.105)	0.078 (0.096)	0.171*** (0.044)	-0.008 (0.012)	0.005 (0.006)	0.116** (0.048)	0.110*** (0.027)	0.024 (0.019)	0.021** (0.010)	0.010 (0.007)	0.011*** (0.004)	0.002 (0.002)	0.001 (0.001)				
OBC 2010	0.673*** (0.178)	0.563*** (0.094)	-0.031 (0.083)	-0.018 (0.039)	-0.020* (0.011)	-0.017*** (0.005)	-0.031 (0.038)	-0.017 (0.021)	0.008 (0.016)	0.018* (0.010)	-0.008 (0.006)	-0.005* (0.003)	0.001 (0.002)	0.001 (0.001)				
SC Woman 2010	1.521*** (0.241)	1.554*** (0.116)	0.123 (0.110)	0.244*** (0.051)	-0.010 (0.013)	-0.004 (0.006)	0.049 (0.053)	0.094*** (0.031)	0.093*** (0.027)	0.102*** (0.013)	-0.003 (0.007)	-0.001 (0.004)	0.012*** (0.004)	0.011*** (0.002)				
SC 2010	1.505*** (0.209)	1.663*** (0.101)	-0.035 (0.092)	0.102** (0.039)	-0.034*** (0.011)	-0.024*** (0.005)	0.097** (0.046)	0.035 (0.024)	0.031 (0.019)	0.027*** (0.010)	0.002 (0.006)	-0.008*** (0.003)	0.001 (0.002)	0.001 (0.001)				
No. of Observations	4342	15779	4342	15779	4342	15779	4342	15779	4342	15779	4342	15779	4342	15779				
R-squared	0.088	0.140	0.051	0.111	0.032	0.064	0.014	0.074	0.027	0.057	0.006	0.057	0.025	0.046				
H ₀ :OBC=OBCW	0.145	0.079	0.189	0.000	0.230	0.000	0.001	0.000			0.001	0.000						
(H ₀ :SC=SCW)	0.949	0.397	0.148	0.008	0.044	0.000			0.026	0.000			0.003	0.000				
Mean Dep. Var	7.754	7.843	1.379	1.351	0.177	0.172	0.334	0.418	0.100	0.110	0.042	0.052	0.011	0.013				
Village Controls	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
District FE		✓		✓		✓												
Reservation 2005		✓		✓		✓												

***, **, * indicate significance at the 1%, 5%, and 10% levels respectively. Robust standard errors are reported in parentheses. The sample is restricted to those villages that were unreserved in 2005 and 2015 and the estimated effects are of the reservation category in 2010. Outcome variables are indicated in the column headers and refer to the total number of candidates, number of female candidates, proportion of female candidates, number of female OBC candidates, and proportion of female OBC candidates. Controls for demographics (share of SC, total population, share of female population), and district fixed effects are included as indicated.

Table A6: *The quality (as measured by literacy) of candidates in the 2015 election in unreserved villages following reservation in 2010*

	Total Lit.		No. Lit. Men		No. Lit. Women		Sh. Literate		Sh. Lit. OBC Women		Sh. Lit. SC Women	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Gen. Woman 2010	0.263 (0.180)	0.024 (0.091)	0.295* (0.164)	0.065 (0.083)	-0.032 (0.066)	-0.041 (0.032)	0.014 (0.010)	0.001 (0.004)	-0.003 (0.004)	-0.001 (0.002)	0.001 (0.001)	-0.001 (0.001)
OBC Woman 2010	0.973*** (0.204)	0.722*** (0.100)	0.876*** (0.185)	0.589*** (0.091)	0.097 (0.075)	0.134*** (0.036)	0.042*** (0.010)	0.021*** (0.004)	0.005 (0.005)	0.006** (0.003)	0.002 (0.002)	0.000 (0.001)
SC Woman 2010	1.563*** (0.230)	1.511*** (0.110)	1.403*** (0.215)	1.265*** (0.101)	0.161* (0.089)	0.245*** (0.041)	0.061*** (0.010)	0.040*** (0.004)	-0.001 (0.005)	0.002 (0.003)	0.011*** (0.003)	0.009*** (0.001)
SC 2010	1.493*** (0.198)	1.575*** (0.096)	1.499*** (0.183)	1.486*** (0.088)	-0.006 (0.072)	0.090*** (0.032)	0.059*** (0.009)	0.035*** (0.004)	-0.000 (0.004)	-0.006*** (0.002)	0.001 (0.002)	0.001 (0.001)
OBC 2010	0.607*** (0.169)	0.535*** (0.090)	0.613*** (0.153)	0.529*** (0.082)	-0.006 (0.065)	0.006 (0.031)	0.027*** (0.009)	0.016*** (0.004)	-0.005 (0.004)	-0.003 (0.002)	0.000 (0.001)	0.000 (0.001)
No. of Observations	4342	15779	4342	15779	4342	15779	4342	15779	4342	15779	4342	15779
R-squared	0.083	0.134	0.077	0.127	0.026	0.065	0.046	0.150	0.003	0.050	0.027	0.030
H ₀ :OBC=OBCW	0.047	0.081	0.116	0.542	0.115	0.001	0.075	0.192	0.016	0.001		
H ₀ :SC=SCW	0.766	0.597	0.667	0.050	0.063	0.000	0.870	0.261			0.001	0.000
Mean Dep. Var	6.155	6.288	5.193	5.341	0.962	0.947	0.758	0.765	0.029	0.036	0.008	0.008
Village Controls	✓		✓		✓		✓		✓		✓	
District FE		✓		✓		✓		✓		✓		✓
Reservation 2005		✓		✓		✓		✓		✓		✓

*** ** * indicate significance at the 1%, 5%, and 10% levels respectively. Robust standard errors are reported in parentheses. The sample is restricted to those villages that were unreserved in 2005 and 2015 and the estimated effects are of the reservation category in 2010. Outcome variables are indicated in the column headers and refer to the total number of candidates, number of female candidates, proportion of female candidates, number of female OBC candidates, and proportion of female OBC candidates. Controls for demographics (share of SC, total population, share of female population), and district fixed effects are included as indicated.

2.B Non-linear Effects of Reservation

2.B.1 Multiplicative Effects of Reservation

Table A7: Election of women as Gram Pradhan in 2015 allowing for non-linear effects across reservation categories

	Woman GP	
	(1)	(2)
Gen. Woman 2010	0.042** (0.017)	0.040** (0.017)
OBC Woman 2010	0.021 (0.018)	0.025 (0.018)
SC Woman 2010	-0.003 (0.020)	0.005 (0.020)
SC 2010	0.011 (0.018)	0.024 (0.017)
OBC 2010	-0.002 (0.015)	0.003 (0.015)
Gen. Woman 2005	0.041** (0.016)	0.044*** (0.016)
OBC Woman 2005	0.020 (0.017)	0.030* (0.017)
SC Woman 2005	0.000 (0.023)	0.015 (0.023)
SC 2005	-0.006 (0.020)	0.011 (0.020)
OBC 2005	0.024 (0.020)	0.026 (0.020)
Gen. Woman 2010 X SC Woman 2005	-0.007 (0.032)	-0.007 (0.032)
Gen. Woman 2010 X OBC Woman 2005	-0.001 (0.033)	-0.010 (0.033)
Gen. Woman 2010 X Gen. OBC 2005	0.018 (0.042)	0.017 (0.041)
Gen. Woman 2010 X Gen. SC 2005	-0.044 (0.027)	-0.046* (0.027)
SC Woman 2010 X Gen. Woman 2005	-0.026 (0.026)	-0.026 (0.026)
SC Woman 2010 X OBC Woman 2005	0.032 (0.033)	0.022 (0.033)
SC Woman 2010 X Gen. OBC 2005	-0.026 (0.043)	-0.028 (0.042)
OBC Woman 2010 X Gen. Woman 2005	-0.015 (0.025)	-0.011 (0.025)
OBC Woman 2010 X SC Woman 2005	0.095* (0.050)	0.077 (0.050)
OBC Woman 2010 X Gen. SC 2005	0.014 (0.036)	0.002 (0.035)
Gen. OBC 2010 X Gen. Woman 2005	-0.021 (0.024)	-0.014 (0.024)
Gen. OBC 2010 X SC Woman 2005	-0.014 (0.029)	-0.022 (0.029)
Gen. OBC 2010 X Gen. SC 2005	0.024 (0.026)	0.009 (0.026)
Gen. SC 2010 X Gen. Woman 2005	-0.046** (0.023)	-0.049** (0.023)
Gen. SC 2010 X OBC Woman 2005	-0.015 (0.026)	-0.027 (0.026)
Gen. SC 2010 X Gen. OBC 2005	-0.038 (0.032)	-0.048 (0.032)
No. of Observations	15780	15780
R-squared	0.003	0.025
Mean Dep. Var	0.165	0.165
District FE		✓

***, **, * indicate significance at the 1%, 5%, and 10% levels respectively. Robust standard errors are reported in parentheses. The outcome variable is a dummy variable that equals 1 if a woman is elected Gram Pradhan in an unreserved village in 2015. The coefficients reported in the table are the effects of different series of reservation across election cycles allowing for interaction effects between different types of reservation categories. District fixed effects are included in Column (2).

2.B.2 Heterogeneous Effects by 1995-2000 Reservation Status

Table A8: Election of women (general category) as Gram Pradhan allowing for heterogeneous effects depending on whether or not a village was reserved for women in 1995 and 2000

	Woman GP			
	(1)	(2)	(3)	(4)
Woman (combined) 2010	0.755*	0.150	0.129	0.120
	(0.390)	(0.123)	(0.137)	(0.086)
No. of Observations	22	64	51	71
R-squared	0.420	0.212	0.204	0.041
Mean Dep. Var	0.159	0.159	0.159	0.159
Village Controls	✓	✓	✓	✓
Reserved for women in 1995 and 2000	✓			
Reserved for women in 2000		✓		
Reserved for women in 1995			✓	
Not reserved for women in 1995 and 2000				✓

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Robust standard errors are reported in parentheses. The outcome variable is a dummy variable that equals 1 if a woman is elected Gram Pradhan in an unreserved village in 2015. The coefficients reported in the table are the effects of village being reserved for women, all sub-categories combined, in 2010 on the 2015 election outcomes. The check-marks at the bottom show the various samples that are selected based on their being reserved (or not) for women in 1995 and/or 2000. Demographics controls are from the 2011 census and are - the total population, share of women, share of SC individuals, share of literate people and share of literate women. District fixed effects are included as indicated.

Table A9: Election of women or OBC women as Gram Pradhan allowing for different reservation histories in a linear additive way

	Woman				OBC Woman	
	(1)	(2)	(3)	(4)	(5)	(6)
Woman (combined) 2010	0.053 (0.073)	0.034 (0.038)				
Gen. Woman 2010			0.077 (0.101)	0.058 (0.049)	0.098 (0.063)	0.039 (0.032)
OBC Woman 2010			0.007 (0.085)	-0.030 (0.044)	0.106 (0.068)	0.029 (0.029)
OBC 2010	-0.004 (0.077)	0.052 (0.045)	-0.010 (0.079)	0.040 (0.045)	0.020 (0.024)	0.039* (0.021)
SC Woman 2010			0.077 (0.097)	0.060 (0.060)	-0.003 (0.023)	-0.004 (0.028)
SC 2010	-0.012 (0.071)	-0.026 (0.039)	-0.010 (0.072)	-0.025 (0.039)	0.016 (0.031)	0.017 (0.026)
No. of Observations	164	560	164	560	164	560
R-squared	0.124	0.028	0.129	0.034	0.104	0.061
H ₀ :OBC=OBCW				0.082	0.114	0.715
Mean Dep. Var	0.085	0.100	0.085	0.100	0.024	0.036
Reservation Before 2005	✓	✓	✓	✓	✓	✓
Village Controls	✓		✓		✓	
District FE		✓		✓		✓
Reservation 2005		✓		✓		✓

***, **, *, indicate significance at the 1%, 5%, and 10% levels respectively. Robust standard errors are reported in parentheses. The outcome variable is a dummy variable that equals 1 if a woman is elected Gram Pradhan in an unreserved village in 2015. The coefficients reported in the table are the effects of a village's reservation status in 2010 on the 2015 election outcomes. Columns (1), (3) and (5) are restricted to villages that were unreserved in 2005 and 2015 whereas the remaining columns, (2), (4), and (6) are those villages that were unreserved in 2015. All columns include a series of fixed effects for every reservation status in the 1995 and 2000 elections. Demographics controls are from the 2011 census and are - the total population, share of women, share of SC individuals, share of literate people and share of literate women. District fixed effects are included as indicated.

Chapter 3

Voting from Abroad: Assessing the Impact of Local Turnout on Expatriates’ Voting behaviour*

3.1 Introduction

Over 150 countries in the world allow their expatriate citizens to vote in their country of origin. These external voting rights have been widely debated across countries and elections (Ellis et al., 2007, Østergaard-Nielsen et al., 2019, Wellman, 2021). This issue has become more salient due to the increasing global migrations where, according to the United Nations, over 281 million people of foreign origin live in a different country (UNDESA, 2020). This large amount of non-resident citizens living abroad could have important electoral consequences for the country of origin and in some cases, the expatriates’ votes could even sway elec-

*This paper has been jointly written with Rubén Poblete Cazenave and Alessandro Toppetta

tions.¹ Despite this, we know very little about expatriates' voting behaviour. In particular, we know little about the host-country drivers of expats' decision to participate in home country elections.

Living abroad impacts individuals' identities and beliefs. Recent studies analyse how voters mobilise when embedded in two political and institutional contexts (see, for instance, Ciornei and Østergaard-Nielsen (2020) and references therein). The evidence suggests that experiencing a different socio-political context affects migrants' voting behaviour (Fidrmuc and Doyle, 2004).² However, one of the major difficulties in studying the impact of the host country on expatriates' voting behaviour is that expatriates, at least to some extent, can choose where to reside. Expatriates choose where to settle according to their preferences and restrictions, such as economic or migration political restrictions to mobility. This non-random self-selection can severely impact the conclusions of these studies as any correlations could be driven by the joint distribution of migrants' and host countries' characteristics. Additionally, the lack of granular data on emigrants' electoral behaviour and their specific geographical location have limited the scope of these studies, where several studies have to rely on self-reported declarations of political attitudes from surveys instead of actual electoral participation.

In this paper, we study how the *host* country's electoral turnout impacts expatriates' voting behaviour in their *home* country elections. Electoral turnout is commonly regarded as an indicator of a country's quality of democratic life, which provides legitimacy to the democratic

¹Data from the OECD for 2014 reveals that 17 percent of Ireland's population live abroad, 14 percent for Portugal and New Zealand, and 12 percent for Mexico. For the United Kingdom, this is almost seven percent. Additionally, the right to vote from abroad was highly debated during the Brexit referendum, where over 700,000 Britons living in other European Countries for more than 15 years were not allowed to vote. These citizens were among the most affected by the referendum and their participation could have had an important impact on the election. For examples for other countries see Mexico, US 2020 House of Representatives, and the Senate election, and Peru (in Spanish).

²Using postwar Germany and comparing West versus East Germans, Alesina and Fuchs-Schündeln (2007) show that being exposed to different political regimes had a long-lasting impact on people's political preferences.

process (Smets and Van Ham, 2013). Increases in turnout promote individuals' attachment to the act of voting, and affect a community's information, attitudes, and norms about future voting (Fujiwara et al., 2016). These socio-political changes might well impact the political behaviour of migrants living in those communities.

There are two opposite arguments on how expatriates' political engagement can be affected by the host country's political participation (Tsuda, 2012, Ciornei and Østergaard-Nielsen, 2020). On the one hand, the *zero-sum* argument states that inclusive host countries decrease migrants' engagement in homeland politics. Migrants spend their finite social and economic resources on the society to which they feel most attached to, leaving limited resources to simultaneously participate in the other society.³ On the other hand, the *complementarity* argument suggests a positive reinforcement of engagement between the host and home country, where political learning in the host country promotes expats' participation in home country elections.

To understand how the host-country turnout affects expats' electoral participation in their country of origin, we use unique microdata on Chilean expatriates who registered to vote from abroad in the 2017 Chilean Presidential election. Our data covers nearly 11,500 Chilean expats living in European Union (EU) countries who registered to vote in the 2017 presidential election. Using information on the expats' precise residency and the exact voting booth where they voted, we match each individual to the corresponding turnout at the booth level. We geocoded the place of residency for each Chilean expat and matched this with the past turnout in EU elections at the district level. To measure the electoral turnout in the host country, we focus on the 2014 EU parliament elections thereby keeping electoral institutions constant across countries

³For instance, the zero-sum argument might be more prevalent when social exclusion in the host country drives migrants to be more attached to their home country or when the assimilation process in the host country discourages transborder attachment to the homeland. This latter alternative might be driven by the desire of the immigrants to assimilate in their new country of residence.

as well as the timing of the election.⁴

To provide causal evidence, we instrument the host country's EU electoral turnout at the district level with rainfall on the day of the EU election in 2014. Rainfall can be interpreted as a transitory shock affecting the contemporaneous voting cost, which is unlikely to affect the future benefits and costs of voting since it is outside of the control of voters, candidates or any other political agent.⁵ In this sense, rainfall gives us an exogenous shock in the cost of voting on the exact day of the election and thus negatively affects the turnout. Furthermore, we include country fixed effects to account for any additional differences across countries that might affect the decision to vote. Hence, our main specification exploits within-country rainfall variation, while even accounting for the average past rainfall for the day of the election.

Our main finding is that a 1 percentage point decrease in the host country's local turnout (caused by high rainfall) increases expatriates' turnout in their home country's election by 1 percentage point. This effect is robust to different specifications. Furthermore, to ascertain that the relationship between local host country turnout and expats' turnout in the home country is not spurious, we run a set of placebo experiments instrumenting the EU district turnout with the rainfall 1 week and 1 month before and after the EU election. Our result only holds for the rainfall occurring on the exact day of the election. The main results suggest that immigrants face a trade-off between home country and host country politics in line with the *zero-sum* argument. Hence, socio-political changes (driven by increases in local turnout) such as a community's information, higher attachment to the act of voting, and norms do affect migrants' political behaviour.

An alternative explanation for the negative result is that Chileans

⁴Electoral participation for national and EU parliament elections are highly correlated across EU countries. See main text.

⁵This instrument has been extensively used in the literature. For example, Fujiwara et al. (2016) use election day rainfall to identify group habit formation in voting. Madestam et al. (2013) use rainfall to identify the causal effects of protests on subsequent political outcomes.

with dual nationality might be voting in the Chilean election in an effort to compensate for not voting in the EU election. We use data from the census of Chileans living abroad to study this alternative. We do not find evidence in line with this. Instead, most of the evidence we find is consistent with the zero-sum argument. Chilean expatriates that are more likely to be integrated in the host country community are less likely to vote in the Chilean election when the turnout in the local community is high.

To further understand which demographic or contextual factors are most important in driving the impact of local turnout on migrants' decision to vote in their home country and which groups are mostly affected, we perform a heterogeneity analysis. First, we analyse whether differential effects exist across groups potentially perceiving different levels of host country assimilation: depending on the size of the Chilean network in the local community, whether they live in small or large communities, based on age and whether they live in the city center or not. Second, we also analyse whether differential effects exist depending on the host country's characteristics, particularly, we use data from the European Value Study (EVS) to analyse whether the host country's attitudes towards immigrants matter. Third, using data from the census of Chileans living abroad, we analyse differential effects across Chileans expats with a Chilean partner versus those with a non-Chilean partner, and across those Chileans for whom language and prejudice towards Chilean immigrants were among the main difficulties they faced when they migrated.

We find that Chileans in the youngest cohorts, those living in rural areas and in areas with smaller communities are most affected by the local EU turnout. We also find stronger effects among Chilean voters who live in communities more open to migrants and for those with a non-Chilean partner as well as for those reporting that language was not a difficulty they experienced while migrating. All these factors suggest that the negative relationship we find is potentially a result of the integration of Chilean immigrants into the local communities of their host countries. Hence, increases in local political participation promote immi-

grants' engagement in local politics at the expense of the home country politics in localities where it is easier to integrate.

Moreover, to add further suggestive evidence about the existing mechanisms, we analyse whether the effect of local turnout correlates with secondary outcomes. We find that higher local EU turnout is associated with increases in political participation of host country individuals and their interest in following politics in the newspaper on daily basis. These results are in line with the mechanisms suggested in Fujiwara et al. (2016), where increases in turnout promote local interest in politics. Furthermore, we also find that local EU turnout is correlated with a higher probability of Chilean expatriates participating more in local organization (cultural/voluntary/religious organizations) in the host country, while reducing their participation in Chilean organizations abroad. This evidence is in line with the trade-off faced by immigrants in terms of their host and home country involvement as suggested by the zero-sum argument.

Our paper contributes to different strands of the literature. A bulk of studies have analysed how migrants impact their country of origin through different channels such as remittances (Edwards and Ureta, 2003, Yang, 2008), migrant networks and foreign direct investment and trade (Javorcik et al., 2011, Parsons and Vézina, 2018), among others.⁶ A nascent strand within this literature analyses the impact of migration on politics in origin countries.⁷ Based on cross-country data, Spilimbergo (2009) and Docquier et al. (2016) show that emigration promotes democratization in home countries. Other articles exploring microdata for different countries have shown that migration improves political institutions in the home country through a higher demand for accountability (Batista and Vicente, 2011), shaping migrants' political views (Fidrmuc and Doyle, 2004), and their social network in the home country (Nikolova et al., 2017, Batista et al., 2019). Chauvet and Mercier (2014) shows that

⁶See Docquier and Rapoport (2012) for an in-depth discussion on high-skilled emigration and its consequences for their home countries.

⁷See Kapur (2014) for a review of this literature.

returned migrants affect electoral outcomes through their increased political participation and by diffusing political norms across their networks.

An important and understudied aspect of how migration affects the politics of the country of origin is through emigrants' enfranchisement.⁸ A few recent studies have analysed the determinants of emigrants' electoral participation on their country of origin. Ahmadov and Sasse (2016) note that host countries with strong economies and democracies incentivise electoral engagement in home-country politics. Along similar lines, Ciornei and Østergaard-Nielsen (2020) find that experiencing political learning promotes expat participation in home country elections, especially if the host country has solid democratic institutions. We contribute to this literature by providing the first causal evidence that the host country's electoral turnout decreases expatriates' decision to vote in their country of origin. In this sense, not only individuals' political preferences might be affected when living abroad (Fidrmuc and Doyle, 2004), but individuals' likelihood of participating in their home country elections are impacted by the turnout in the home country. Our finding points towards an integration of people living abroad who end up distancing themselves even more from the home country when exposed to high turnout in the area where they live.

We also contribute to the literature studying the determinants of electoral participation (Blais, 2006). Understanding how people's decisions to vote are affected by contextual factors is of crucial relevance for the well-functioning of democracy. We contribute to this literature by analyzing an increasingly important yet understudied group: expatriates voting in home country elections.

Evidence shows that past turnout impacts future turnout through habit formation (Gerber et al., 2003, Meredith et al., 2009, Fujiwara et al., 2016). Particularly, Fujiwara et al. (2016) shows how short-term shocks to the cost of voting driven by rainfall impacts future voting behaviour within the community. They argue that higher turnout increases

⁸ There is also a related literature analyzing how ethnic diversity affects turnout. See for instance Cho et al. (2006), Förster (2018).

future turnout by increasing the expressive value of voting for individuals in the local community. In line with their results, we further show that changes in local aggregate turnout have far reaching consequences in the sense that they also affect the turnout of migrants in their home country elections.

As in the case of Fujiwara et al. (2016), our study is related to the literature studying the role of social influence on political participation (Gerber et al., 2008, Funk, 2010, DellaVigna et al., 2016). People might vote to show others that they contribute to society by fulfilling their civic obligation. A distinct feature of our study is that we analyse voters (Chilean expats) interacting in a society where other individuals in their social network (coworkers, neighbours, friends in the host country) do not participate in the election (2017 Chilean presidential election). We observe that even in these contexts, the community has an impact on individuals' electoral participation.

The chapter is organized as follows. Section 3.2 describe the Chilean institutional context and the 2017 presidential election, as well as the data. Section 3.3 lays out the empirical strategy. Section 3.4 presents the results, while section 3.5 discusses the heterogeneity analysis. Finally, we conclude the chapter in Section 3.6.

3.2 Institutional Setting and Data

3.2.1 Chilean Presidential Election and Chilean expatriates

Chile is a republic with a presidential system. Since 2005, presidential elections occur every four years on the third Sunday of November in the year before the incumbent president's term expires. The candidate who gets the absolute majority of the valid votes becomes the president.⁹ If no single candidate gets the absolute majority, a runoff election occurs between the two most-voted candidates.

⁹Valid votes excludes null or blank votes.

Our analysis is focused on the Chilean general elections held on Sunday November 19, 2017. This was the first general election in which Chileans living abroad were allowed to vote. To be eligible to vote, citizens had to be at least 18 years old at the time of the election and they had to be registered in the corresponding embassy or consulate before July 1, 2017. This process had to be done in person. Nearly 40,000 people registered to vote across more than 100 electoral districts around the world.¹⁰

3.2.2 Data sources and sample

Microdata on Chileans registered to vote. The list of Chilean citizens residing abroad and registered to vote in the 2017 election comes from the *Servicio Electoral de Chile* (SERVEL), the Chilean national body in charge of elections. The dataset includes voters' names, national identity numbers, gender, registered home addresses, and the corresponding voting booth and consulate.

Among the people on the entire list of Chileans registered to vote, we focus on those living in countries within the European Union. The number of registered voters is around 11,500. For each one of these voters we determine the exact geographic coordinates (latitude and longitude) associated with their addresses by using Google's Geocoding API.¹¹ Figure 3.1 shows the geographic distribution of these (Chilean) voters across the European Union where each red dot indicates a single Chilean voter. As can be seen, there is substantial presence of Chileans across different locations in Europe, mainly concentrated in Western European countries.

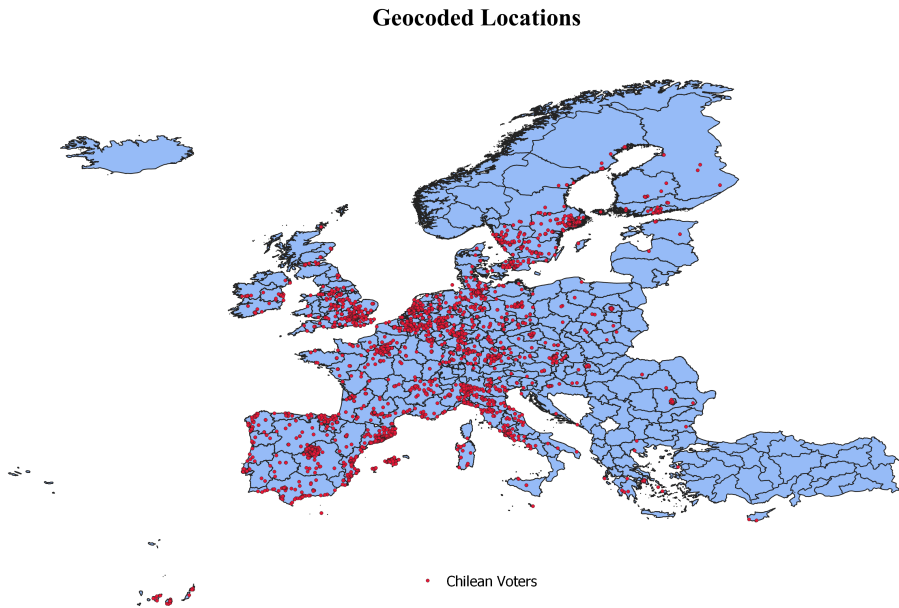
Turnout data is available at both the voting booth level and the consulate level from SERVEL. We scraped this data from SERVEL's

¹⁰This exceeds 10 percent of the population eligible to vote outside Chile, which is nearly 360,000 people.

See <https://minrel.gob.cl/minister-munoz-on-the-vote-abroad-for-the-presidential-election-2017-11-07/121822.html> [accessed in March 31, 2020.]

¹¹Google's geocoding API enables users to extract the latitude and longitude for addresses.

Figure 3.1: Location of registered Chilean Voters across the EU



website for both rounds of voting using Python.¹² We match each voter to the corresponding consulate turnout level.

Additionally, we manually imputed the addresses of each Chilean consulate and obtained the corresponding geographic coordinates using the same process as for individual registered voters (figure 3.1). Then, we computed the distance (in kilometres) from each voter’s address to their assigned voting booth using QGIS and the geo-coordinates of individual voters and voting locations (consulates or embassies).

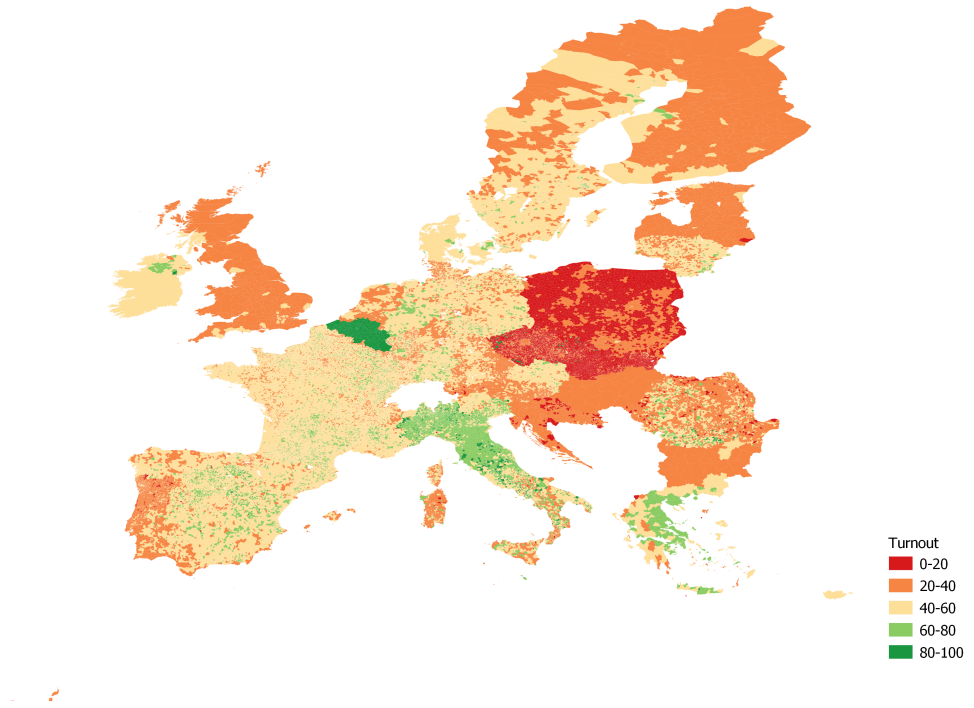
Voters’ turnout European Election. The 2014 European Union Parliament election turnout data is available at a sub-national level from each country. Table A9 in the appendix provides details on the granularity of the EU 2014 election turnout reported by each country. This data has been compiled into country level shapefiles by DataStory.org.¹³ Figure 3.2 shows the electoral participation across EU countries for the 2014 Parliament election. As can be seen, the electoral turnout varies substantially across countries. At the extremes we see Belgium (where voting is mandatory by law) where almost 90 percent of the eligible voters actually vote, whereas in Poland the turnout is only 24 percent. The granularity of the data not only allows us to exploit cross-country differences but to also exploit the differences within countries. For some countries there are large differences across localities within the nation. This is the case for Italy, for instance, where there are sharp differences between the north and the south (and the islands).

We use the country-level shapefiles to create a composite EU shapefile that we use to match Chilean voters, using their home addresses, with the relevant sub-national 2014 European Parliament election turnout. This means that for each EU country, each Chilean voter that resides in that country is matched to the European Parliament turnout at the level

¹²Certain consulates had numerous voting booths. SERVEL’s website did not report the turnout for certain voting booth in some consulates. Therefore, the consulate level turnout data was manually checked and re-calculated using consulate level turnout data from SERVEL.

¹³This data is publicly accessible on their GitHub page: <https://github.com/datastory-org/ep-election-turnout>.

Figure 3.2: Turnout of voters in the 2014 EU Parliament election at sub-national level (the precise level is detailed in Table A9)



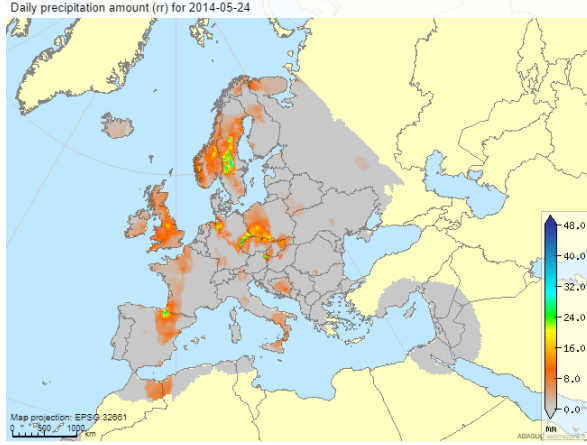
of reporting. Note that the level of reporting varies across countries. For example, Chileans living in Italy will be matched to the corresponding European Parliament election turnout for the specific *municipality* where they reside, whereas in Germany they will be matched with the corresponding *district* (Table A9). In the chapter we refer to this sub-national level of reporting as 'district'.

A unique feature of using the data from the European Union Parliament election turnout is that the institution is held constant across countries participating in the election as well as the timing of the election. At the same time, in appendix 3.H, we present evidence that the turnout in the EU election and national elections is highly correlated - countries with higher turnout in EU parliament elections are the same as those that have higher turnout in national elections.

Rainfall data. Data on daily rainfall (precipitation) comes from The European Centre for Medium Range Weather Forecasts. The data is provided for a grid that covers Europe and each cell is 0.75x0.75 degrees (approximately 80x80km) in 12 hour steps. Rainfall data is measured as the total precipitation in millimetres in each 12 hour interval. We use rainfall data for each country's EU 2014 election day, 22nd-25th May 2014, and the Chilean election days; the first round of voting was on November, 19th, 2017, followed by a run-off election on December 17th, 2017. For each EU electoral location we compute the total rainfall during the 24 hour period for the specific voting date. Figure 3.3 shows the distribution of rain during the EU election days.¹⁴ In order for the rainfall on the election day to be used effectively as a unexpected and transitory shock, we also compute the average total rainfall for the EU parliament election dates for twenty years, from 1994-2013, to control for the average past rainfall across districts.

¹⁴According to the American Meteorological Society (<http://glossary.ametsoc.org/wiki/rain>), rain is defined as 'light' when it falls at a rate of 2.5 millimetres per hour or less and 'heavy' when it falls at a rate of more than 7.6 millimetres per hour.

Figure 3.3: Distribution of rainfall on voting day of the 2014 European Parliament election



3.3 Empirical strategy

To estimate the effect of the host country's turnout, measured by the European Parliament turnout in 2014, on the electoral participation of Chileans living abroad in their national election in 2017, we first describe our baseline (naive) specification and then describe our main identification strategy (IV).

The baseline estimation equation (OLS) is:

$$turnout_{idc}^{CL} = \beta turnout_{dc}^{EU} + \gamma \mathbf{X}_{idc} + \alpha_c + \epsilon_{idc} \quad (3.1)$$

where CL and EU denote Chile and EU countries, respectively, $turnout_{idc}^{CL}$ is the 2017 Chilean election turnout at the consulate-booth level where the Chilean expat i living in district d in country c voted, $turnout_{dc}^{EU}$ is the turnout in the 2014 EU parliament election for district d in country c . \mathbf{X}_{idc} is a vector of controls, including the gender and age of the Chilean expat, and some variables accounting for the cost of voting such as the log of distance from voters i 's address to the corresponding voting booth/consulate,¹⁵ and the rainfall on the day of

¹⁵Expatriate voters in the Chilean Presidential Election were assigned to a voting

the Chilean election. Additionally, we also include country fixed effects α_c to capture time-invariant unobservable characteristics of the host country.

Our parameter of interest is β , which captures the relationship between turnout in the host country and the Chilean expats' turnout in the Chilean presidential election. However, this β might be biased, given that Chilean expats can choose where they live and therefore it is plausible that the host country characteristics may be correlated with certain immigrant's characteristics and their electoral behaviour. For example, Chileans with high sense of civic duty, which is unobserved and omitted, may select into countries with like-minded citizens.

To account for this potential endogeneity and estimate a causal relationship between host country turnout and Chilean expatriate turnout, we propose an instrumental variable strategy. We exploit a transitory shock to the cost of voting in the 2014 EU parliament elections, namely, rainfall which generates exogenous variation in the cost of voting across electoral districts across EU countries. The first stage regression is:

$$turnout_{dc}^{EU} = \theta rain_{dc}^{EU} + \delta AvgPastRain_{dc}^{EU} + \lambda \mathbf{X}_{dc} + \alpha_c + v_{dc}^{EU} \quad (3.2)$$

where $rain_{dc}$ is the rainfall in district d in country c on the day of the 2014 EU parliament election.¹⁶ $AvgPastRain_{dc}$ is the average rainfall in district d in country c on the day of the European election over the past twenty years (Madestam et al., 2013). After controlling for country fixed effects and the average past rainfall, we argue that the rainfall can be considered as good as random.

As is standard for IV estimations, our estimator requires a mono-

booth and could vote either at the Chilean Embassy or consulate. In our analysis we know all the possible options within each country and calculate the distance between the Chilean voters' registered home address and the closest voting location. This distance between their residence and the voting booth is the relevant one to proxy the cost given that voting occurred on a Sunday.

¹⁶This instrument has been extensively used in the literature (Madestam et al., 2013, Fujiwara et al., 2016).

tonicity assumption, where the electoral turnout decreases as rainfall increases for every individual. This could be problematic if the unit of observation in the first stage was individual-level voter turnout. For example, individuals who enjoy outdoor activities may experience a fall in the cost of voting during rainy days. However, we study the effect of rainfall shocks on voters' turnout in the European Parliamentary election at the *district* level - instead of the individual level - where the monotonicity assumption is more likely to hold as these shocks work at the community level. In this setup, the parameter β captures a local average treatment effect (LATE) of host-country turnout on Chilean expats' turnout. For interpretation, it is worth noting that the 'compliers' are Chilean expats living in districts with greater shares of voters in the 2014 EU parliament elections whose voting behaviour was affected by the rain.¹⁷

Finally, we take into account that data can be spatially correlated. We compute clustered standard errors at the district level, which is level at which we observe the 2014 EU turnout and rainfall shocks. We also estimate standard errors using Conley (1999, 2008) correction. We allow for spatial correlation across households within a radius of 10 kilometres (namely, the average size of a district). Our results are robust to using alternative cut-offs.

3.4 Results

We start by describing the results from our naive estimation from OLS, which are reported in the first three columns of Table 3.1. In column (1), where we do not include any controls, the point estimate is positive yet small in magnitude. Despite not being significant, this suggests that Chileans who live in areas with higher local turnout in the 2014 EU election turned out to vote more in the 2017 Chilean Presidential election. Once we add country fixed effects, the sign of the coefficient flips and

¹⁷These 'affected' voters are commonly called marginal voters as they are on the margin between voting and abstaining, and therefore were affected by the transitory increase in the cost of voting due to rain.

becomes negative, although it is still not significant. The reversal in the sign of the estimate highlights the role played by selection effects in such a context. That is, it seems that Chilean expats with high sense of civic duty might be living in countries with high electoral turnout. Finally, in column (3), we add individual-level controls. In this case, the magnitude of the parameter is similar, but we gain greater precision in the OLS estimate. We find a negative and statistically significant relationship between voter turnout in the 2014 EU parliamentary election and in the 2017 Chilean Presidential election. While this change in sign of the estimate highlights the importance of accounting for selection effects when studying the effect between host country and expatriate voting behaviour, the OLS estimate may still suffer from selection bias.

Table 3.1: *Estimates on the role of past election and the 2014 European election turnout on the turnout in the 2017 Chilean election (first round).*

Dependent variable:	Turnout in the 2017 Chilean election (first round)					
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS	OLS	IV	IV	IV
2014 EU <i>local</i> turnout	0.016 (0.058)	-0.071 (0.055)	-0.076*** (0.029)	-0.917*** (0.318)	-0.887*** (0.308)	-0.885*** (0.297)
Observations	11428	11428	11398	11428	11398	11398
Avg Chilean turnout	62.372	62.372	62.372	62.372	62.372	62.372
F-stat (first stage)				16.025	16.558	17.244
Other controls	No	No	Yes	No	Yes	Yes
Country FE	No	Yes	Yes	Yes	Yes	Yes
Controls IV stage						
Country FE				Yes	Yes	Yes
Avg. Past Rainfall				No	No	Yes

Note. The table presents effects of the 2014 European election turnout which is instrumented by the rainfall on the day of the election on the turnout in the 2017 Chilean election from Chileans living abroad. Turnout from Chileans living abroad is at the voting booth level. EU turnout is at the district level. Each individual is assigned the turnout from Chilean and EU elections based on the their geocoded residence. Rainfall data is in millilitres precipitation per day and distance is measured in kilometres from voting booth based on the geocoded individual's residence. Other controls are gender, age, the distance and the square of the distance from the voting booth and rainfall the day of the Chilean election, regional controls at NUTS2 level in 2013 (the population density, GDP per capita (PPP), Unemployment rate, and the percentage of people with no education and with tertiary education) and the geocoded location of the Chilean voter. Standard errors in parentheses are clustered at district level (***) $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

To fully account for the endogeneity problem, we further use an IV

estimation strategy as described in the previous section, where we instrument the 2014 local EU turnout with total rainfall in the electoral district on the relevant election day. Before discussing these results, we first present evidence for the relevance of our instrument. Table 3.2 presents the estimates of the first stage (see equation 3.2) where the outcome variable is voter turnout in the 2014 EU election and the explanatory variable of interest is rainfall on the election day. Overall, regardless of the specification, rainfall decreases turnout. Our preferred specification, column (3), shows the effect of a rainfall shock on the EU turnout when we control for country fixed effects and the average rainfall on the EU election day over the twenty years prior to this election. A 1 millimetre increase in day rainfall in the district translates into a 0.46 percentage point decrease in the turnout in the EU election in 2014. The estimates from table 3.2 coupled with the F-statistics reported in columns (4)-(6) of table 3.1 give us confidence in our IV approach.

Table 3.2: First Stage of IV Regression

Dependent variable:	European election turnout in 2014		
	(1)	(2)	(3)
Rainfall on the day of European election	-1.124*** (0.174)	-0.447*** (0.112)	-0.460*** (0.105)
Observations	11428	11428	11428
R^2	0.083	0.714	0.716
F	41.842	.	.
Country FE	No	Yes	Yes
Avg. Past Rainfall	No	No	Yes

Note. The table presents estimates of the first stage of the IV regression (3.2) of the 2014 European election turnout on the rainfall on the day of the election. EU turnout is at the district level. Rainfall data is in millilitres precipitation per day and distance is measured in kilometres from voting booth based on the geocoded individual’s residence. Standard errors in parentheses are clustered at district level (***) $p<0.01$, ** $p<0.05$, * $p<0.1$).

The results from the IV estimation can be seen in columns (4)-(6) of table 3.1. The coefficient from the IV estimate is larger (in absolute value) than the OLS estimate. While the OLS estimate captures the

effect of permanent drivers of turnout and the IV captures temporary drivers of turnout due to the rainfall shock, the larger point estimate (in absolute value) in the IV goes in line with the bias produced by the self-selection previously described. The results show that a 1 percentage point increase in the 2014 EU turnout in the geocoded district where the Chilean lives translates into an almost equal percentage point (0.92-0.89 percentage points depending on the specification) decrease in the turnout in the 2017 Chilean election. This implies a 1.6 percent decrease in the turnout relative to the average Chilean turnout. These results show that Chileans living in municipalities with higher turnout on the 2014 EU parliamentary election turned out significantly less in the Chilean Presidential election. Using the IV estimation strategy enables us to infer a causal relationship between these variables as - after controlling for country fixed effects and average past rainfall (column (6)) - the realised rainfall is as good as random. It is important to note that a one-to-one comparison with the OLS estimates is not possible as the IV estimates capture a local average treatment effect (LATE). This parameter captures the effect on Chilean expats living in EU districts with marginal voters. That is, the group of compliers in this case are the Chileans who turned out to vote as a result of lower turnout in the 2014 EU election that was due to an unexpected increase in the cost of voting due to rain.

It is also worth mentioning that our analyses thus far have been focused on the first round of the Chilean presidential election (held on November 19, 2017). As no single candidate received a pure majority, there was a second round run-off election on December 17, 2017. We use the data from this election to replicate our first round analyses and examine whether the 2014 EU parliamentary election impacted voting in the second round of the Chilean election even after controlling for the first round. We find similar estimates as in the first round wherein the effect of the turnout in the 2014 EU parliamentary election on the turnout in the Chilean national election is negative. The turnout in the first round of the Chilean election is perhaps unsurprisingly positively correlated with the turnout in the second round. The results from the

OLS and IV estimations can be found in Appendix 3.D. In Appendix 3.I, we also present the estimates for our main specification with a correction for geographical correlation across the standard errors using Conley (1999, 2008). We allow for spatial correlation across households within 10 kilometres and our results are robust to using alternative cut-offs.

More importantly, we also perform several placebo tests where we instrument the 2014 EU electoral turnout by a rainfall shock that occurred 1 month and 2 weeks before and after the EU election to verify that our results are not spurious. Appendix 3.B shows that we do not find any effects in these placebo regressions.

Our main result shows a negative effect of local 2014 EU turnout on Chilean turnout. This rules out a positive reinforcement of engagement between host country and expatriate political participation (*complementary* argument).¹⁸ Instead, our results provide support for the *zero-sum* argument wherein expatriates increase their engagement with their host countries at the expense of their engagement with their home country politics. We explore this possibility in the next section where we take advantage of heterogeneity in the Chilean expatriate population as well as analyse differences in attitudes towards in migrants in the host country.

3.5 Heterogeneity analysis

In this section we investigate relevant heterogeneous effects to shed light on the channels driving the negative relationship between voting in the 2014 EU election and Chilean expatriate voting in the 2017 Chilean presidential election.

As pointed out by Fujiwara et al. (2016), increases in electoral turnout promote the attachment to the act of voting for individuals in the community as well as affecting the information in the local community, attitudes, and norms about future voting. These socio-political changes seems to affect the political behaviour of migrants living in those com-

¹⁸In this context, this either does not play a role or, if it does, it is not strong enough to overcome the alternatives.

munities as suggested by the results from the previous section, where expatriates decrease their engagement in their home country politics when there is high electoral turnout in the community where they reside.

While our results suggest that migrants face a trade-off between home country politics and host country politics (*zero-sum* argument), another alternative is that there might be a compensatory voting behaviour. In this case Chilean expatriates who have dual citizenship and did not turn out to vote in the 2014 EU election, "compensated" by voting in the 2017 Chilean election. To analyse this, we use data from the Census of Chileans living abroad. Using information about the share of Chilean expatriates with dual citizenship across EU countries (at a NUTS2 level), we do not find any evidence in support of this channel (see Table A8 in the appendix). The coefficient on the interaction between the share of Chileans with dual nationality and the 2014 EU local turnout is small in magnitude and has the opposite sign (positive) to what would be expected if there were compensatory voting behaviour, suggesting that in regions where a higher share of the Chilean population has dual nationality, the effect is weaker.

Next, we explore the heterogeneity across characteristics of the Chilean voters which we believe capture the different pressures or motivations which may affect their engagement with their host country.

Table 3.3 shows the results using our main IV specification (instrumenting the local turnout in the 2014 EU parliamentary election with rainfall on the election day) for different sub-samples. First, we look at differential effects depending on whether the Chilean voters live in the city centre or not (in columns (1)-(2)). This enables us to analyse groups subject to different levels of social pressures; one would expect less social pressures on Chileans living in the city centre. The difference between the estimates in columns (1) and (2) is quite striking. Chileans living outside of the city centre are strongly negatively affected by higher turnout in the 2014 EU election. In contrast, for Chileans living in the city center where, in general, there is greater anonymity and less community interaction, the effect is the opposite. Second, we analyse if the amount

of Chileans living nearby matters. As shown in columns (3)-(4), we do not find differential impacts depending on the number of Chileans living within 5 kilometres.¹⁹ In columns (5)-(6), we study differential effects depending on the size of the community as the integration and social pressures are higher in smaller communities (Funk, 2010). The negative effects are larger for Chileans living in small community areas. In areas where the local network is smaller and perhaps more insulated, and where the 2014 EU turnout was higher, Chileans were less likely to vote in their home election, suggesting that perhaps this voter behaviour is a result of integration of Chileans into their local communities.

Finally, columns (7)-(10) present the results for different age cohorts. It is interesting to see that the group most affected by the local host country turnout is the youngest group (aged 18-23 in 2017). This group of voters is arguably the most impressionable, as it would be their first opportunity to vote in any election, and plausibly the most embedded in the host country society. While the size of this group is smaller than the others and so the estimates are less precise, the magnitude of the effect in this group is noteworthy. The relatively smaller effect of the age groups in between is in line with the fact that people within these age-groups (particularly those aged 24-34) are more likely to have moved to the EU for education and/or employment opportunities and are relatively more likely to return to Chile. Therefore, their voting incentives may be somewhat different.

¹⁹We draw a circle of 5 kilometres radius around each Chilean voter's registered address and count how many other Chilean registered voters live within that area. After taking the average, we split the sample into Chilean voters living with higher than the average number and lower than the average number.

Table 3.3: *Heterogeneous effects (network): estimates from IV regressions on the role of the 2014 European election turnout on the turnout in the 2017 Chilean election (first round).*

Turnout in the 2017 Chilean election (first round)											
Dependent variable:		<i>Living in city center</i>		<i>Chilean network</i>		<i>Community size</i> (host country)		<i>Age</i>			
		No	Yes	Small	Large	Small	Large	18-23	24-34	35-55	Above 56
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
2014 EU local turnout		-1.333*** (0.416)	1.569*** (0.514)	-0.974*** (0.288)	-1.005*** (0.371)	-1.947*** (0.685)	-0.480** (0.192)	-1.222*** (0.420)	-0.807*** (0.216)	-0.819*** (0.246)	-0.888** (0.411)
Observations		5466	4549	5609	4406	5366	4649	416	2925	3260	3414
Other controls		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls IV stage											
Country FE		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Avg. Past Rainfall		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note. The table presents the heterogeneous effects of the 2014 European election turnout which is instrumented by the rainfall on the day of the election on the turnout in the 2017 Chilean election from Chileans living abroad. Turnout from Chileans living abroad is at the voting booth level. EU turnout is at the district level. Each individual is assigned the turnout from Chilean and EU elections based on the their geocoded residence. Rainfall data is in millilitres precipitation per day and distance is measured in kilometres from voting booth based on the geocoded individual's residence. Other controls are gender, age, the distance and the square of the distance from the voting booth and rainfall the day of the Chilean election, regional controls at NUTS2 level in 2013 (the population density, GDP per capita (PPP), Unemployment rate, and the percentage of people with no education). Community action includes a broad range of activities and is sometimes described as 'social action' or 'community engagement'. Standard errors in parentheses are clustered at district level in columns (*** p<0.01, ** p<0.05, * p<0.1).

Chilean census data. Here we use data from the census of Chileans living abroad to explore heterogeneous effects along margins that capture different levels of integration. The results are reported in Table 3.4. Columns (1)-(2) show that for Chileans whose partners are not Chilean, the effect is negative whereas for Chileans with Chilean partners, the effect is positive. While there are many caveats to the interpretation of this result (e.g. this sample is restricted to Chileans who are married), the difference in the sign of the estimates is noteworthy. Chileans whose partners are also Chilean are more likely to be engaged in their home country politics than those with non-Chilean partners. Next, in columns (3)-(4), we look at differential effects among Chilean expatriates who reported that the language was an issue for integrating in the host country. The difference in the point estimates is quite stark (although not statistically significant). Chileans who reported that language was not an issue when migrating and lived in areas with higher EU turnout in 2014 had much lower turnout in the 2017 Chilean Presidential Election. In contrast, the effect is positive (although not precisely estimated), for Chileans who did experience difficulties in migration due to language. Finally, columns (5)-(6) shows that Chileans who did not have difficulty migrating due to facing prejudice against Chilean migrants are slightly more affected by the 2014 EU local turnout. Overall, the trade-off between home and host country is stronger for groups arguably more integrated in the local community.

Table 3.4: *Heterogeneous effects (Census of Chileans living abroad): estimates from IV regressions on the role of the 2014 European election turnout on the turnout in the 2017 Chilean election (first round).*

Dependent variable:	Turnout in the 2017 Chilean election (first round)					
	% foreign partners		Encountered difficulty in migration			
	No	Yes	due to language		due to prejudice	
	No	Yes	No	Yes	No	Yes
	(1)	(2)	(3)	(4)	(5)	(6)
2014 EU <i>local</i> turnout	1.190*	-0.362*	-0.543***	1.212	-1.598**	-1.001***
	(0.722)	(0.188)	(0.177)	(5.086)	(0.768)	(0.371)
Observations	4484	5771	5193	5062	5152	5103
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls IV stage						
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Avg. Past Rainfall	Yes	Yes	Yes	Yes	Yes	Yes

Note. The table presents the heterogeneous effects of the 2014 European election turnout which is instrumented by the rainfall on the day of the election on the turnout in the 2017 Chilean election from Chileans living abroad. Turnout from Chileans living abroad is at the voting booth level. EU turnout is at the district level. Each individual is assigned the turnout from Chilean and EU elections based on the their geocoded residence. Rainfall data is in millilitres precipitation per day and distance is measured in kilometres from voting booth based on the geocoded individual's residence. Other controls are gender, age, the distance and the square of the distance from the voting booth and rainfall the day of the Chilean election, regional controls at NUTS2 level in 2013 (the population density, GDP per capita (PPP), Unemployment rate, and the percentage of people with no education and with tertiary education) and the geocoded location of the Chilean voter. Attitudes towards immigrants at regional level are from the 2007 European Value Study. Standard errors in parentheses are clustered at district level in columns (** p<0.01, ** p<0.05, * p<0.1).

European Values Study. While the heterogeneous effects presented in Tables 3.3 and 3.4 are focused on differences within the Chilean community, in Table 3.5 we explore potential differences in the effect of the 2014 EU turnout on the turnout among Chilean expatriates based on the attitudes towards migrants across European communities.

We use survey data from the European Values Study in 2007 and aggregate the responses at the NUTS2 level and then separately estimate the effects for Chileans living in areas that are more open to migrants and/or have a more positive view towards immigration. In columns (2)

and (4), compared to columns (1) and (3), respectively, we see that Chileans living in areas which have a more positive view towards migrants and disagree more strongly with the statement that there are "too many immigrants" are more affected by the 2014 EU election turnout. As before, it seems that in communities where immigrants integrate better, increases in local turnout promote a higher level of disengagement of immigrants with their home country politics.

Table 3.5: *Heterogeneous effects (attitude towards immigrants): estimates from IV regressions on the role of the 2014 European election turnout on the turnout in the 2017 Chilean election (first round).*

Dependent variable:	Turnout in the 2017 Chilean election (first round)			
	<i>Too many immigrants</i>		<i>Immigrants enrich Cultural life</i>	
	Agree	Disagree	No	Yes
	(1)	(2)	(3)	(4)
2014 EU <i>local</i> turnout	-1.235*** (0.446)	-2.292** (1.033)	-0.899*** (0.221)	-2.903** (1.210)
Observations	5847	4159	5498	4508
Other controls	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Controls IV stage				
Country FE	Yes	Yes	Yes	Yes
Avg. Past Rainfall	Yes	Yes	Yes	Yes

Note. The table presents the heterogeneous effects of the 2014 European election turnout which is instrumented by the rainfall on the day of the election on the turnout in the 2017 Chilean election from Chileans living abroad. Turnout from Chileans living abroad is at the voting booth level. EU turnout is at the district level. Each individual is assigned the turnout from Chilean and EU elections based on their geocoded residence. Rainfall data is in millilitres precipitation per day and distance is measured in kilometres from voting booth based on the geocoded individual's residence. Other controls are gender, age, the distance and the square of the distance from the voting booth and rainfall the day of the Chilean election, regional controls at NUTS2 level in 2013 (the population density, GDP per capita (PPP), Unemployment rate, and the percentage of people with no education and with tertiary education) and the geocoded location of the Chilean voter. Attitudes towards immigrants at regional level are from the 2007 European Value Study. Standard errors in parentheses are clustered at district level in columns (***) $p < 0.01$, (**) $p < 0.05$, (*) $p < 0.1$).

3.5.1 Analysis on secondary outcomes

The heterogeneous effects presented in the previous section are purely suggestive yet they are in line with the *zero-sum* argument. The evidence shows that increases in local turnout produce a higher disengagement with the home country politics for immigrants that might be more integrated in the community. Hence, the integration of Chilean immigrants into the local communities of their host countries produces disengagement towards their home country.

In this section, we further explore whether increases in the local turnout promote local political involvement for individuals in the host country community and also promote migrants political participation in the host country at the expense of the home country politics. For this purpose, we use variables from the European Value Study 2017 and the Census of Chileans living abroad as secondary outcomes.

In line with the *zero-sum* argument, in Table 3.6 below, we present some correlations that show that Chileans who live in areas with higher local turnout in the 2014 EU elections have greater participation rates in local community organisations and less so in Chilean organisations.

Table 3.6: *Estimates from OLS regressions on the role of the 2014 European election turnout on secondary outcomes from the Chilean census.*

Dependent variable:	Participate in Chilean organization	Participate in cultural, voluntary or religious organization in <i>host country</i>
	(1) (OLS)	(2) (OLS)
2014 EU turnout (NUTS2)	-0.243*** (0.061)	0.216* (0.113)
Observations	6121	6121
Average (%)	9.574	20.095
F-stat (first stage)		
Other controls	Yes	Yes

Note. The table presents effects of the 2014 European election turnout which is instrumented by the rainfall on the day of the election on the probability to participate in a Chilean organization in the host country, the probability to participate in cultural organization in the host country and the probability to go back to Chile. The data are from the 2016 Chilean census of Chilean living abroad. EU turnout is at the NUTS2 level. Each individual answering the Chilean census is assigned the turnout from EU elections based on the their region of residence. Other controls are the gender, the age, the age squared, the education, a dummy equal to 1 if the respondent is born in Chile, the year in which the respondent left Chile, the number of years the respondent has lived in the current residence, and the dummies equal to 1 if the mother, father or grandparents were born in Chile and a dummy equal to 1 if the respondent is employed. Standard errors in parentheses are clustered at regional level (** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$).

Moreover, on the host country side, table 3.7 shows that a greater turnout in the 2014 EU parliamentary elections is positively correlated with local individuals caring more about political institutions and that they become more politically active. This is consistent with Fujiwara et al. (2016) who argue that increases in turnout promote the community's information, attitudes, and norms about future voting.

These results are purely suggestive, and although we are unable to dig deeper into the mechanisms, we put forward these estimations as potential indications of the *zero-sum* channel playing a role. We are aware that the effects presented here are not definitive evidence, but we believe that they do present value as they enable us to take a step to shed some light on the mechanisms that may be driving our main result.

Table 3.7: *Estimates from OLS regressions on the role of the 2014 European election turnout on secondary outcomes from the 2017 European Value Study.*

Dependent variable:	Important to respect political institutions (1) (OLS)	Attend lawful demonstrations (2) (OLS)	Follow politics in daily papers (3) (OLS)	Interest in politics (4) (OLS)
2014 EU turnout	0.005*** (0.001)	0.015*** (0.001)	0.015*** (0.003)	0.002 (0.002)
Observations	23279	22635	23323	23347
Average	3.603	1.924	2.452	2.447
Other controls	Yes	Yes	Yes	Yes

Note. The table presents the correlation between the 2014 European election turnout and outcomes from the European Value Study (EVS). The data are from the 2017 EVS. EU turnout is at the NUTS2 level. Each individual answering the EVS is assigned the turnout from EU elections based on the their region of residence. Other controls are the gender, the age, the age squared, the education, a dummy equal to 1 if the respondent is born in the country, a dummy equal to 1 if the respondent is employed. Standard errors in parentheses are clustered at regional level (***) $p < 0.01$, ** $p < 0.05$, * $p < 0.1$).

3.6 Conclusion

This paper analyses how host country political engagement affects expatriate electoral participation in their country of origin. Using unique microdata on Chilean expatriates living in Europe, we estimate that a 1 percentage point *increase* in voter turnout in the 2014 EU parliamentary election (instrumented by the amount of rainfall at the day of the election) *decreases* Chilean expatriates turnout in the 2017 Chilean presidential election by 1 percentage point. These results are in line with the *zero-sum* argument wherein migrants become more engaged in their host countries' politics and as a result are less so in Chilean politics. Our heterogeneity analysis and the use of secondary outcomes present suggestive support of this theory. We find that the youngest cohorts are most affected by the local EU turnout, as well as those living in rural areas and in areas with smaller communities where the integration with the local communities is arguably higher. Furthermore, we also find stronger effects among Chilean voters who live in communities that are more open to migrants, which suggests that it is easier to engage in local politics

(at the expense of the home country politics) in areas where it is easier to integrate. Equally, we found stronger effects among Chileans with non-Chilean partners as well as those who report that language was not a difficulty they experienced while migrating are also supportive of this channel. Overall, the evidence shows that increases in local turnout produce a higher disengagement with the home country politics for Chilean expats that might be more integrated in the host country community.

It is important to note that while our IV strategy allows us to causally estimate how Chilean expatriates' electoral participation is affected by the local turnout at their place of residency (driven by a transitory shock to the cost of voting), the focus on causality might come at the expense of exploring the long-term process through which expatriate voting behaviour is affected by the host country. Despite this, our OLS estimates that account for some of the selection (through the use of country fixed) are in the same direction as our IV estimates, giving us greater confidence in our findings regarding the trade-off between home country and host country politics. This implies an important step towards understanding how individual electoral participation may be affected by the voter behaviour, as measured by turnout, of the place where she lives.

Our paper contributes to a better understanding of expatriate voting behaviour and the potential forces at play when countries decide whether or not to expand voting rights to those living abroad. Our findings point towards the crucial role of integration in host country societies and how this affects migrants' political preferences towards their home country. In this sense, our result relates to the stability of the political preferences, suggesting that they seem to be malleable and can evolve over time. Individuals' political values and identities are affected by the current environment, and do not only depend on the initial context where they grew up. Still, our combined results suggest that these values (identities) are quite persistent, as home country turnout is more sensitive to host-country turnout for young individuals whose values are arguably the most malleable. While our result sheds some light on the far-reaching impacts of local turnout on future turnout across borders, further research

has to be made to precisely identify the mechanism of this process. The literature analysing the impact of past turnout on future turnout within a country points out that increases in political participation in the local community promote the community's information, attitudes, and norms about future voting (Fujiwara et al., 2016). We observe evidence that increases in local turnout promote the political engagement in the community and increase the awareness of the importance of political institutions. Further studying how turnout drives societal changes and how these impact migrants' integration in their host countries and political participation would advance our understanding on these increasing yet understudied individuals living abroad.

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Appendices

3.A Determinants of voting

Table A1 presents the estimates of the turnout in the Chilean election from the first round on some important determinants of voting. We estimate this regression by introducing a variable at the time from column 1 to column 5. Finally, in column 5 we introduce all the variables at the same time, while in column 6 we control for country fixed effects.

We confirm results already found in the literature. A higher distance from the voting booth and rain on the day of the election which can are often consider as the cost of voting decrease the turnout. On the other hand, age positively correlates with a higher turnout. This could be because older people have already experienced previous elections and the sunk cost that come with them. Finally, in column 6, we do a horse-race introducing all the variables at the same time and controlling for country fixed effects. Age and the rainfall on the day of the election are statistically significant with the expected signs.

Table A1: *Estimates from OLS regressions on the determinants of the turnout in the 2017 Chilean election.*

Dependent variable:	Turnout in the 2017 Chilean election (first round)					
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS	OLS	OLS	OLS	OLS
Log distance	-0.340 (0.865)				-0.355 (0.822)	0.076 (0.485)
Age		0.051 (0.031)			0.052* (0.029)	0.019* (0.010)
Female			-0.899*** (0.193)		-0.832*** (0.185)	0.042 (0.112)
Rainfall on the day of Chilean election				-0.020 (0.453)	0.022 (0.409)	-2.702*** (0.511)
Observations	11428	11428	11428	11428	11428	11428
R ²	0.003	0.005	0.002	0.000	0.010	0.601
Country FE	No	No	No	No	No	Yes

Note. The table presents some possible determinants of the turnout in the 2017 Chilean election. Turnout in 2017 national election from Chileans living abroad is at the voting booth level. Each individual is assigned the turnout from Chilean based on the their geocoded residence. Rainfall data is in millilitres precipitation per day and distance is measured in kilometres from voting booth based on the geocoded individual's residence. Standard errors in parentheses are clustered at district level (***) p<0.01, ** p<0.05, * p<0.1).

3.B Placebo test

3.B.1 Rainfall shock (2 weeks and 1 month *before* the day of the 2014 EU election)

Table A2: *Placebo test - Rainfall 2 weeks before election day - Estimates from IV regressions on the role of the 2014 European election turnout on the turnout in the 2017 Chilean election.*

Dependent variable:	Turnout in the 2017 Chilean election			
	(1)	(2)	(3)	(4)
	IV	IV	IV	IV
2014 EU <i>local</i> turnout	-8.764 (30.553)	-5.780 (10.815)	-8.764 (29.470)	-5.780 (10.816)
Observations	11398	11398	11398	11398
Other controls	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Controls IV stage				
Avg. Past Rainfall	No	Yes	No	Yes

Note. The table presents the placebo test of the effects of the 2014 European election turnout which is instrumented by the rainfall occurred 2 weeks *before* the day of the election on the turnout in the 2017 Chilean election from Chileans living abroad. Turnout from Chileans living abroad is at the voting booth level. EU turnout is at the district level. Each individual is assigned the turnout from Chilean and EU elections based on the their geocoded residence. Rainfall data is in millilitres precipitation per day and distance is measured in kilometres from voting booth based on the geocoded individual's residence. Other controls are gender, age, the distance and the square of the distance from the voting booth and rainfall the day of the Chilean election, regional controls at NUTS2 level in 2013 (the population density, GDP per capita (PPP), Unemployment rate, and the percentage of people with no education). Standard errors in parentheses are clustered at district level in columns 1-3 , while standard errors are estimated using Conley (1999, 2008) correction in columns 4-6 (** p<0.01, * p<0.05, * p<0.1). We allow for spatial correlation across households within 10 kilometres. Our results are robust to using alternative cut-offs.

Table A3: *Placebo test - Rainfall 1 month before election day - Estimates from IV regressions on the role of the 2014 European election turnout on the turnout in the 2017 Chilean election.*

Dependent variable:	Turnout in the 2017 Chilean election			
	(1)	(2)	(3)	(4)
	IV	IV	IV	IV
2014 EU <i>local</i> turnout	-142.664 (2680.335)	93.823 (817.990)	-142.664 (2810.378)	93.823 (854.888)
Observations	11398	11398	11398	11398
Other controls	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Controls IV stage				
Avg. Past Rainfall	No	Yes	No	Yes

Note. The table presents the placebo test of the effects of the 2014 European election turnout which is instrumented by the rainfall occurred 1 month *before* the day of the election on the turnout in the 2017 Chilean election from Chileans living abroad. Turnout from Chileans living abroad is at the voting booth level. EU turnout is at the district level. Each individual is assigned the turnout from Chilean and EU elections based on the their geocoded residence. Rainfall data is in millilitres precipitation per day and distance is measured in kilometres from voting booth based on the geocoded individual's residence. Other controls are gender, age, the distance and the square of the distance from the voting booth and rainfall the day of the Chilean election, regional controls at NUTS2 level in 2013 (the population density, GDP per capita (PPP), Unemployment rate, and the percentage of people with no education). Standard errors in parentheses are clustered at district level in columns 1-3 , while standard errors are estimated using Conley (1999, 2008) correction in columns 4-6 (***) $p<0.01$, ** $p<0.05$, * $p<0.1$). We allow for spatial correlation across households within 10 kilometres. Our results are robust to using alternative cut-offs.

3.B.2 Rainfall shock (2 weeks and 1 month *after* the day of the 2014 EU election)

Table A4: Placebo test - Rainfall 2 weeks after election day - Estimates from IV regressions on the role of the 2014 European election turnout on the turnout in the 2017 Chilean election.

Dependent variable:	Turnout in the 2017 Chilean election			
	(1)	(2)	(3)	(4)
	IV	IV	IV	IV
2014 EU <i>local</i> turnout	3.530 (2.824)	4.112 (3.003)	3.530 (2.780)	4.112 (3.142)
Observations	11398	11398	11398	11398
Other controls	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Controls IV stage				
Avg. Past Rainfall	No	Yes	No	Yes

Note. The table presents the placebo test of the effects of the 2014 European election turnout which is instrumented by the rainfall occurred 2 weeks *after* the day of the election on the turnout in the 2017 Chilean election from Chileans living abroad. Turnout from Chileans living abroad is at the voting booth level. EU turnout is at the district level. Each individual is assigned the turnout from Chilean and EU elections based on the their geocoded residence. Rainfall data is in millilitres precipitation per day and distance is measured in kilometres from voting booth based on the geocoded individual's residence. Other controls are gender, age, the distance and the square of the distance from the voting booth and rainfall the day of the Chilean election, regional controls at NUTS2 level in 2013 (the population density, GDP per capita (PPP), Unemployment rate, and the percentage of people with no education). Standard errors in parentheses are clustered at district level in columns 1-3 , while standard errors are estimated using Conley (1999, 2008) correction in columns 4-6 (*** p<0.01, ** p<0.05, * p<0.1). We allow for spatial correlation across households within 10 kilometres. Our results are robust to using alternative cut-offs.

Table A5: *Rainfall 1 month after election day - Estimates from IV regressions on the role of the 2014 European election turnout on the turnout in the 2017 Chilean election.*

Dependent variable:	Turnout in the 2017 Chilean election			
	(1)	(2)	(3)	(4)
	IV	IV	IV	IV
2014 EU <i>local</i> turnout	-2.366** (1.075)	-2.376** (1.024)	-2.366 (1.835)	-2.376 (1.794)
Observations	11398	11398	11398	11398
Other controls	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Controls IV stage				
Avg. Past Rainfall	No	Yes	No	Yes

Note. The table presents the placebo test of the effects of the 2014 European election turnout which is instrumented by the rainfall occurred 1 month *after* the day of the election on the turnout in the 2017 Chilean election from Chileans living abroad. Turnout from Chileans living abroad is at the voting booth level. EU turnout is at the district level. Each individual is assigned the turnout from Chilean and EU elections based on the their geocoded residence. Rainfall data is in millilitres precipitation per day and distance is measured in kilometres from voting booth based on the geocoded individual's residence. Other controls are gender, age, the distance and the square of the distance from the voting booth and rainfall the day of the Chilean election, regional controls at NUTS2 level in 2013 (the population density, GDP per capita (PPP), Unemployment rate, and the percentage of people with no education). Standard errors in parentheses are clustered at district level in columns 1-3 , while standard errors are estimated using Conley (1999, 2008) correction in columns 4-6 (*** p<0.01, ** p<0.05, * p<0.1). We allow for spatial correlation across households within 10 kilometres. Our results are robust to using alternative cut-offs.

3.C Balance test

We present some balance test of whether rainfall on the day of the EU election in 2014 at NUTS2 level can predict social pressure in the 2012 form the European Social Study.

Table A6: Balance Tests from European Social Survey (2012)

Dependent variable:	Voted in last election (1)	Right to vote for immigrants only if citizens (2)	Voters discuss politics before deciding how to vote (3)	Trust in European Parliament (4)	Allow many immigrants from outside Europe (5)	Immigrants enrich cultural life (6)
Panel A: No controls						
Rainfall on the EU election day (2014)	0.000 (0.002)	-0.000 (0.012)	-0.012 (0.008)	-0.052*** (0.015)	-0.032*** (0.006)	-0.073*** (0.014)
Observations	21168	20451	20256	19656	20578	20599
Country FE	No	No	No	No	No	No
Avg. Past Rainfall	No	No	No	No	No	No
Panel B: conditional on average past rainfall						
Rainfall on the EU election day (2014)	-0.003 (0.002)	-0.009 (0.012)	-0.013 (0.009)	-0.009 (0.017)	-0.008 (0.005)	-0.022 (0.016)
Observations	21168	20451	20256	19656	20578	20599
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Avg. Past Rainfall	Yes	Yes	Yes	Yes	Yes	Yes

Note. The table presents the balance tests of variables from ESS 2012 on the rainfall on the day of the election conditional on the average past rainfall on the day of the election and country fixed effects. Standard errors in parentheses are clustered at NUTS2 level (***) p<0.01, ** p<0.05, * p<0.1).

3.D Second Round Turnout Estimates

Table A7: *Estimates on the role of past election and the 2014 European election turnout on the turnout in the 2017 Chilean election (second round).*

Dependent variable:	Turnout in the 2017 Chilean election (second round)					
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS	OLS	IV	IV	IV
Chile turnout (first round)	0.893*** (0.008)		0.892*** (0.008)	0.836*** (0.034)		0.842*** (0.039)
2014 EU <i>local</i> turnout		-0.069** (0.029)	-0.024 (0.016)		-1.260*** (0.321)	-0.505*** (0.117)
Observations	11398	11398	11398	11398	11398	11398
Avg Chilean turnout	55.669	55.669	55.669	55.669	55.669	55.669
F-stat (first stage)				27.052	15.773	
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls IV stage						
Country FE				Yes	Yes	Yes
Avg. Past Rainfall				Yes	Yes	Yes

Note. The table presents effects of the 2014 European election turnout which is instrumented by the rainfall on the day of the election on the turnout in the 2017 Chilean election from Chileans living abroad. Turnout from Chileans living abroad is at the voting booth level. EU turnout is at the district level. Each individual is assigned the turnout from Chilean and EU elections based on the their geocoded residence. Rainfall data is in millilitres precipitation per day and distance is measured in kilometres from voting booth based on the geocoded individual's residence. Other controls are gender, age, the distance and the square of the distance from the voting booth and rainfall the day of the Chilean election, regional controls at NUTS2 level in 2013 (the population density, GDP per capita (PPP), Unemployment rate, and the percentage of people with no education and with tertiary education) and the geocoded location of the Chilean voter. Standard errors in parentheses are clustered at district level (***) $p < 0.01$, (**) $p < 0.05$, (*) $p < 0.1$).

3.E Compensatory Effect

Table A8: Estimates from IV regressions on the role of the 2014 European election turnout on Chilean turnout by the share of Chileans with dual nationality.

	<i>Turnout in the 2017 Chilean election (first round)</i>			
	(1)	(2)	(3)	(4)
2014 EU <i>local</i> turnout	-0.927*** (0.339)		-0.882** (0.356)	-1.228*** (0.283)
Share Chilean with EU nationality		-0.012 (0.008)	-0.005 (0.010)	-0.513* (0.303)
Interaction term				0.011* (0.006)
Observations	11398	10194	10194	10194

Note. Other controls are gender, age, the distance and the square of the distance from the voting booth and rainfall the day of the Chilean election, regional controls at NUTS2 level in 2013 (the population density, GDP per capita (PPP), Unemployment rate, and the percentage of people with no education). The share of Chileans with EU nationality comes from the Chilean census and is matched at the NUTS2 level. (***) $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

3.F Data sources

Table A9 presents the data sources of the 2014 EU turnout data at the district level.

Table A9: Data sources for European Parliament election turnout

Country	GIS	Data	Level	Count
Austria	Statistik Austria	Bundministerium Fur Inneres	Town	2376
Belgium	Katholieke Universiteit te Leuven	Service public federal Interieur	Canton	209
Croatia	GADM	State Electoral Commission	Municipality and Town	560
Czech Republic	Geoportal UZK	Czech Statistical Office	Municipality	6258
Denmark	GADM	Statistics Denmark	Municipality	99
Finland	National Land Survey of Finland	Statistics Finland	Municipality	311
France	Open Street Map	Ministry of the Interior	Municipality	34982
Germany	GeoDataZentrum (v. 2014-01-01)	Federal Returning Officer	District	11477
Greece	GADM	Ministry of Interior	Municipality	326
Hungary	GADM	National Election Office	County and Capital	20
Ireland	GADM	Elections Ireland	Constituency	3
Italy	GADM	Department for Internal and Territorial Affairs	Municipality	8096
Luxembourg	Natural Earth Data	EU	Country	1
Netherlands	PDOK	Electoral Council	Municipality	403
Poland	GADM	Government	Municipality and City	2478
Portugal	DADOS	Ministry of Internal Administration	Parish	3223
Romania	GADM	Autoritatea Electoral? Permanent?	Municipality	2939
Spain	GADM	Ministry of the Interior	Municipality	8112
Sweden	Valmyndigheten	Valmyndigheten	Electoral district	5837
UK	Office for National Statistics	Parliament	Local Authority District	380
Northern Ireland	Open Data Ni	Electoral Office for Northern Ireland	District Electoral Area	80

Note. This table the data sources of the turnout from the 2014 European Parliament election.

3.G Registered electorates by country

Table A10: *Percentage of Chileans registered to vote by country of residency*

	Population born in Chile (A)	Registered to vote (B)	B/A (%)
Austria	1,264	189	15
Belgium	4,085	537	13
Czech Republic	127	52	41
Denmark	1,373	99	7
Finland	367	97	26
France	14,310	1,384	10
Germany	12,958	1,814	14
Greece	380	84	22
Ireland	311	139	45
Italy	11,129	725	7
Luxembourg	165	28	17
Netherlands	2,949	451	15
Portugal	276	87	32
Spain	68,130	3,037	4
Sweden	28,072	1,453	5
UK	7,071	1,134	16

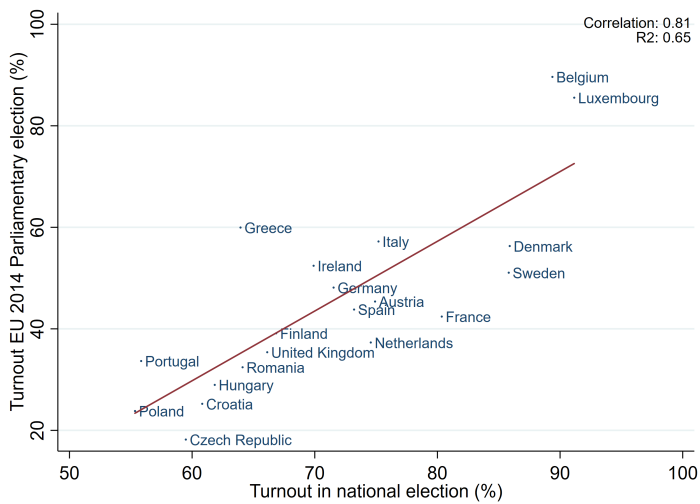
Notes. The table shows the proportion of Chileans living abroad (born in Chile) that were registered to vote. The table shows information of a selection of countries where more than 100 Chileans were born in Chile according to the Census (column 2). The population born in Chile comes from the Second registry of Chileans Abroad (DICOEX - INE, 2019). The number of people registered to vote comes from SERVEL and refers to those registered for the 2017 presidential election.

3.H Comparison between EU parliament and national turnout

Figure A1 presents a scatter plot of 2014 EU and national turnout. The national elections considered occurred between 2011 and 2015. The clear pattern that emerges is a high correlation of the two (the Pearson correlation is 0.81) and up to 65 percent of the variation is explained. Countries with a high turnout in EU Parliament elections are the same ones with

a high turnout in national elections.

Figure A1: Comparison between the turnout from the 2014 European Parliament election and national election.



Note. The scatter plot presents a comparison between the EU turnout from the EU 2014 Parliament election and the national election. The national elections considered occurred between 2011 and 2015.

3.I Conley standard errors

Table A11 presents effects of the 2014 European election turnout which is instrumented by the rainfall on the day of the election on the turnout in the 2017 Chilean election from Chileans living abroad. Columns 1-3 present the results from the 1st round, while columns 4-6 present the results from the 2nd round. The standard errors in parentheses are estimated using Conley (1999, 2008) correction. We allow for spatial correlation across households within 10 kilometres. Our results are robust to using alternative cut-offs.

Table A11: *Estimates from IV regressions (with Avg. past rainfall and Country FE) on the role of past election and the 2014 European election turnout on the turnout in the 2017 Chilean election.*

Dependent variable:	Turnout in the 2017 Chilean election					
	First Round			Second Round		
	(1)	(2)	(3)	(4)	(5)	(6)
Chile turnout (first round)				0.820*** (0.048)		0.842*** (0.057)
2014 EU <i>local</i> turnout	0.186 (0.167)	-0.951*** (0.363)	-0.951*** (0.354)		-1.260*** (0.362)	-0.505*** (0.179)
Observations	11398	11398	11398	11398	11398	11398
Avg Chilean turnout	62.372	62.372	62.372	55.669	55.669	55.669
Other controls	No	Yes	Yes	Yes	Yes	Yes
Country FE	No	Yes	Yes	Yes	Yes	Yes
Controls IV stage						
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Avg. Past Rainfall	Yes	Yes	Yes	Yes	Yes	Yes

Note. The table presents effects of the 2014 European election turnout which is instrumented by the rainfall on the day of the election on the turnout in the 2017 Chilean election from Chileans living abroad. Columns 1-3 present the results from the 1st round, while columns 4-6 present the results from the 2nd round. Turnout from Chileans living abroad is at the voting booth level. EU turnout is at the district level. Each individual is assigned the turnout from Chilean and EU elections based on the their geocoded residence. Rainfall data is in millilitres precipitation per day and distance is measured in kilometres from voting booth based on the geocoded individual's residence. Other controls are gender, age, the distance and the square of the distance from the voting booth and rainfall the day of the Chilean election, regional controls at NUTS2 level in 2013 (the population density, GDP per capita (PPP), Unemployment rate, and the percentage of people with no education). Standard errors in parentheses are estimated using Conley (1999, 2008) correction (***) $p < 0.01$, ** $p < 0.05$, * $p < 0.1$). We allow for spatial correlation across households within 10 kilometres. Our results are robust to using alternative cut-offs.

Sammanfattning

Den här avhandlingen består av tre fristående uppsatser. Kapitel 1 och 2 fokuserar på drivkrafterna och effekterna av kvinnors deltagande i den offentliga sektorn. Medan kapitel 1 utforskar historiska skäl som påverkar kvinnors arbetskraftsdeltagande i dag, med speciellt fokus på den offentliga sektorn i Östafrika, analyserar kapitel 2 effekterna av en riktad politik för att öka andelen kvinnor i de lokala styrena i Indien. Kapitel 3 är lite annorlunda. Det är en studie av utvandrares valbeteende bland chilensare som är bosatta i EU.

Trots att dessa tre kapitel är ganska olika finns det ett gemensamt tema som löper genom alla tre, nämligen fokuset på den offentliga sektorn och styrande, vilket har stått i centrum för mina forskningsintressen.

Den långsiktiga effekten av protestantisk missionsverksamhet på kvinnors arbetskraftsdeltagande (The Long-Run Impact of Protestant Missionary Activity on Female Labour-Force Participation)

I det första kapitlet studerar jag den differentiella effekten av historisk protestantisk och katolsk missionsverksamhet på kvinnors arbetskraftsdeltagande i dag i tre tidigare brittiska kolonier i Östafrika - Kenya, Tanzania och Uganda. Missionärer spelade en central roll när det gällde att tillhandahålla utbildning under kolonialtiden och framför allt har protestantisk missionsverksamhet haft en bestående och större effekt på läs- och skrivkunnighet, utbildning och demokratiska värden. Detta har främst hänförts till det faktum att det inom den protestantiska tron

anses att en individ måste kunna läsa Bibeln för att få tillgång till Guds ord (*Sola Scriptura*). I mina analyser beräknar jag den relativa effekten av protestantisk missionsverksamhet, jämfört med katolsk missionsverksamhet, på kvinnors utbildning, makt inom hushållet och arbetskraftsdeltagande, med speciellt fokus på formell anställning, i Östafrika.

Genom att använda data över vart de katolska och protestantiska missionärsstationerna var belägna på tidigt 1900-tal tillsammans med enkätdata, jämför jag utfallen från respondenter som bor i byar med protestantisk missionärsverksamhet med de med katolsk missionärsverksamhet. Jag finner att kvinnor som bor i byar som hade en protestantisk missionsstation på tidigt 1900-tal har fler års utbildning och det är mer sannolikt att de har gått ut åtminstone sjuårig grundskola än de som bor i byar som hade en katolsk missionsstation. Vidare finner jag även att kvinnorna i dessa byar har en lägre acceptans för våld i hemmet och det är mer sannolikt att de har något att säga till om när det gäller hushållets ekonomiska beslut, inklusive hur pengar från deras egen lön ska spenderas.

Med fokus på hur detta påverkar kvinnors sysselsättning finner jag att kvinnor som bor i en by med en protestantisk missionärstation mer sannolikt har en heltidsanställning. Vidare är det också mer sannolikt att de är anställda inom jordbruket med okvalificerat arbete och att de erhåller kontantlön. Dessa mått på anställning kommer från enkätdata som innehåller egenrapporterad information och därmed kanske inte är de mest exakta. Det positiva sambandet mellan protestantisk missionärsverksamhet och dessa mått på sysselsättning tyder emellertid på att det finns en bestående effekt av protestantisk missionärsverksamhet och kvinnors arbetskraftsdeltagande.

Slutligen, för att komma lite närmare att förstå hur historisk missionärsverksamhet hänger samman med kvinnors sysselsättning i den formella sektorn, bygger jag ett nytt dataset som innehåller andelen kvinnliga anställda i den offentliga sektorn i varje distrikt (Local Government Authority office eller LGA) på Tanzanias fastland. Jag finner att distrikt som har protestantisk missionärsverksamhet har en större

andel kvinnliga sysselsatta. Det är också signifikant mer sannolikt att dessa distrikt styrs av en kvinnlig chef.

De resultat som har presenterats i detta kapitel visar att historisk protestantisk missionärsverksamhet har haft en bestående effekt på utbildning, makt och kvinnors och flickors sysselsättning.

Effekten av reservation på kvinnlig representation – bevis från Uttar Pradesh (The Impact of Reservation on Female Representation - Evidence from Uttar Pradesh)

Alltsedan dess självständighet 1947 har Indien haft en regering som till största delen har bestått av män från högre kast. För att komma till rätta med detta så införde Indien 1993 en politik för att förbättra kvinnors och marginaliserade kastgruppers representation i det lokala styret. Politiken innebär att i varje given valcykel så reserveras en viss andel av borgmästarposterna i byarna för kvinnor, marginaliserade kastgrupper eller någon kombination av de två. Reservationen av en borgmästarpost innebär att den enbart kan fyllas med individer som uppfyller dessa demografiska krav. Vidare roterar reservationen av dessa borgmästarposter från en valcykel till en annan så att samma bys borgmästarpost inte ska hamna i samma reservationskategori i två på varandra följande val. Jag använder detta särdrag i politikens utformning för att beräkna vad som händer i byns valcykel när borgmästarposten inte är reserverad när den följer på en valcykel där byns borgmästarpost reserverades för kvinnor.

Genom att använda data från Indiens mest befolkade stat (200 miljoner människor), Uttar Pradesh, beräknar jag att det är mer sannolikt att byar som var reserverade för kvinnliga borgmästare i en valcykel väljer en kvinna i den följande valcykeln. Detta är speciellt påtagligt för kvinnor av lägre kast där det faktum att man reserverar en bys borgmästarpost för dem gör att chansen att en kvinna från en lägre kast väljs i nästa valcykel utan reservation nästan fördubblas.

Denna ökning i sannolikheten att kvinnor väljs i en icke-reserverad by efter reservation förklaras som mest endast delvis med återval av sittande borgmästare. Alla kvinnliga borgmästare i byar som valts genom

reservation är signifikant mindre sannolika att delta vid nästa val när borgmästarposten inte är reserverad. Emellertid, under förutsättning att de väljer att delta i nästa val, så är kvinnliga borgmästare som valdes genom reservation som enbart baserades på kön, vilket innebär att det inte fanns några restriktioner som grundades på kast, lika sannolika att återväljas som icke-reserverade borgmästare. Detta tyder på att det sker någon potentiell positiv selektion där sittande borgmästare väljer att delta i nästa val.

Utöver urval och återval av sittande borgmästare finner jag att i valcykeln efter reservation för kvinnor i en by sker det en förändring i gruppen av kandidater. Det sker en ökning i kvantiteten kandidater inklusive en ökning av antalet kvinnliga kandidater och efter en reservation för kvinnor från lägre kast sker det en ökning av antalet kvinnliga kandidater från lägre kast. Vidare beräknar jag även en ökning av kandidaternas kvalitet, mätt genom läs- och skrivkunnighet. Läs- och skrivkunnigheten på landsbygden i Uttar Pradesh är ungefär 55 procent så läs- och skrivkunnighet är icke-trivial i detta sammanhang. Intressant nog finner jag en ökning i antalet läs- och skrivkunniga kandidater bland såväl män som kvinnor.

Det här kapitlet visar att Indiens reservationspolitik ökar den kvinnliga representationen i det lokal styret när en post inte är reserverad och leder till en generell ökning i valkandidaternas kvalitet.

Att rösta från utlandet – en bedömning av effekten av det lokala valdeltagandet på utvandrares valbeteende (Voting from Abroad: Assessing the Impact of Local Turnout on Expatriates' Voting Behaviour)

med Rubén Poblete Cazenave och Alessandro Toppetta

I det tredje kapitlet studerar vi utvandrares valbeteende vad gäller chilenska utvandrare som bor i Europeiska Unionen (EU). Mer än 150 länder tillåter sina medborgare att rösta från utlandet, men trots det har motivationen hos dessa utvandrare varit relativt understuderad. Vi är intresserade av att förstå valdeltagandet hos chilenska utvandrare

och, framför allt, hur detta påverkas av valdeltagandet i EU-val.

Vi bygger ett dataset som innehåller bosättningsorterna för samtliga registrerade chilenska väljare som bor i EU och länkar dem till det motsvarande valdeltagandet på lokal nivå i EU-valet 2014. Vi fokuserar på valdeltagandet då det anses vara en nyckelindikator på kvaliteten i ett lands demokratiska processer. Vi kan beräkna en kausaleffekt av valdeltagandet i 2014 års EU-val genom att utnyttja en kortsiktig chock i kostnaden av att rösta i EU-valet, nämligen nederbörden på valdagen, och genom att använda en beräkningsteknik med instrumentvariabler.

Vi finner att en procentenhets ökning i valdeltagandet i 2014 års EU-val leder till nästan en procentenhets minskning i valdeltagandet i 2017-års presidentval bland chilenska utvandrare som bor i EU. Denna negativa effekt stöder nollsummeargumentet som säger att mer inkluderande länder minskar migranternas anknytning till politiken i deras hemländer.

För att förstå om det finns ytterligare suggestiva bevis som stöder denna teori använder vi först skillnaderna i de demografiska faktorerna och miljöfaktorerna för chilenska väljare. Vi finner att effekterna är större bland unga chilenska väljare, chilensare som bor i jordbruksområden och att de som bor i mindre samhällen i sitt bosättningsland påverkas mest. Vidare finner vi även att effekterna är större bland chilensare vars partner inte är chilensare och bland dem som rapporterade att språket inte var en svårighet de stod inför när de emigrerade. Sedan utforskar vi även hurvida storleken på effekterna skiljer sig åt beroende på hur öppen den mottagande befolkningen är gentemot immigranter. För att göra detta använder vi enkätdata och finner att i områden där respondenterna rapporterar att de är mer öppna för invandring och anser att immigranter berikar den lokala kulturen är effekterna av valdeltagandet i EU-valet 2014 på det chilenska valdeltagandet större. Detta ger en del suggestiva bevis som stöder teorin att när chilensare är mer integrerade i sitt bosättningsland så sker det på bekostnad av deras anknytning till Chile.

Slutligen beaktar vi även sambandet mellan det lokala valdeltagande i EU-valet och några sekundära utfall som också kan kasta visst ljus över de mekanismer vi beaktar. I linje med våra tidigare rön dokumenterar

vi att ett högre valdeltagande i EU-valen är positivt korrelerat med att chilenare deltar i lokala samhällsgrupper såväl som ett större politiskt intresse bland respondenterna i värdlandet.

Våra resultat presenterar bevis för att när invandrare blir integrerade i politiken och miljön i det land de bor i, så avskärmar de sig från politiken i sitt hemland.

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The Impact of Reservation on Female Representation - Evidence from Uttar Pradesh analyses the effects of India's affirmative action policy (reservation) that aims at increasing the representation of women and marginalised caste groups in local government.

Voting from Abroad: Assessing the Impact of Local Turnout on Expatriates' Voting Behaviour studies the electoral participation of Chilean expatriates who live in the European Union in the 2017 Chilean Presidential election.



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