

# Prizewinning Dissertation 2023

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**No.23-ML**

## The Gendered Impact of Educational Devolution: Evidence from India's Panchayat System

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**Published: June 2023**

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### **Abstract:**

In 1993, India implemented a widespread decentralising reform to empower *panchayats*, village councils, as a way of handing significant policymaking power directly to rural communities, while also including a reservation rate that secured a third of all seats for women. This was heralded as an opportunity to provide greater agency for women in governance. Using National Sample Survey data of households across India, a difference-in-difference strategy is employed to exploit the staggered integration in states of decentralisation and reservation rates to measure the impact on women's educational outcomes. This study finds that, ultimately, the reform had no noticeable effect on educational outcomes in the fifteen years following implementation.

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## 1. Introduction

The 1990s saw a radical shift in the political structure of India through the formalisation of an additional level of government to bring “decision-making closer to the people” (Chattopadhyay and Duflo 2003, 1). The *panchayat raj* institutions were local councils that historically served as a community mediation and governance system for villages across India, albeit with little to no political powers authorised by the national government. However, the rising trend of decentralisation in the latter half of the 20<sup>th</sup> century hit India by storm as the 73<sup>rd</sup> Amendment to the Constitution in 1993 mandated states to devolve significant powers to three tiers of rural panchayats, serving at the district, block, and village level. This was meant to provide the citizenry unprecedented levels of participation and representation in local policymaking while also requiring a reservation rate for women as well as for scheduled castes and tribes. It provided women with 33% of the seats in these newly empowered councils and highlighted a commitment to integrate women into governance.

In the past several decades, a large library of academic literature has sought to analyse the outcomes of decentralisation in India, particularly looking at how it has influenced public service delivery and whether women are meaningfully empowered in their communities to enact positive outcomes that shift the balance on gender equity. Thus far, the literature has found mixed conclusions about India’s programme of decentralisation, with some advocates arguing that it has granted greater accountability and improved public services aligned with the public’s needs (Crook and Manor 1998), as well as having empowered women’s voices in policymaking and increased their political participation (Chattopadhyay and Duflo 2003; Alsop et al. 2000). Conversely, others have argued that the decentralisation has been mostly cosmetic and that the states maintain significant control in *panchayat* matters (Oommen 1999) and that women in power are simply proxies for their husbands or other men in their communities due to pre-existing gender norms and lack of education and training (Ghosh et al. 2015).

With education being a metric where inequality is highly pronounced between men and women, it is notable that the provision and management of primary schooling has officially seen significant functions devolved to the three tiers of panchayats. However, limited literature has been published on the impact of women in *panchayats* on girls’ education, and the studies that exist highlight mixed results. Chattopadhyay and Duflo found that women were effective leaders but did not prioritise education policy during their tenures (2003), while Clots-Figueras (2012) and

Beaman et al. (2012) suggest that a role model effect may occur among young girls and their families as they see women in power, leading them to stay in school longer. In an earlier study, Beaman et al. found that girls' attendance rates fell in districts with women *pradhans*, the elected leader of a *panchayat* with a five-year term, but also saw the ratio of girls to boys improve (2011). Yet, these studies have all been limited in scope, looking at only a handful of districts at a time and over a short period, with a further limitation of only analysing the impact of *pradhans* rather than the reservation rate across all positions. This study aims to address this gap in the literature, to highlight the overall effect that the landmark reform has had on women's education across India over the first fifteen years of implementation.

The staggered implementation of decentralisation, as states established their own legislation and local elections following the amendment, allows for a natural experiment through the use of a difference-in-difference (DiD) strategy developed by Callaway and Sant'Anna (2021), which allows for several waves of treatment groups across multiple time periods. I use this DiD methodology to estimate the effect of the treatment bundle of decentralisation and gender quotas on women's primary school completion rates.

This study contributes to the ongoing conversation in academic literature by quantitatively showing that the formalisation of *panchayats* and their reservation rates for women have not had a causal impact on women's primary completion rates, with the reform having simply maintained the status quo for trends in women's educational attainment. The results of the DiD analysis show that regardless of the length of exposure to treatment there is no statistically significant impact and these results are also reflected in average effects for all waves of treatment.

This study adds to the broad literature by being the first, to my knowledge, quantitative cross-India analysis to estimate the impact of the *panchayat raj* institutions and their reservation rates for women's education, and the results reflect the criticisms listed in the academic literature with states showing hesitance to meaningfully devolve educational functions, as well as a lack of training and capacity building for women in positions of power to effectively impact policymaking.

This paper is structured as follows: Section 2 overviews the relevant literature. Section 3 describes the methodology employed, including a description of the data utilised. Section 4 presents the results and discussion of the difference-in-difference analysis as well as its limitations. Section 5 concludes the paper.

## 2. Literature Review

### 2.1 Decentralisation

Historically, societies across the world have trended to greater political centralisation as their institutions matured (Faguet 2012). However, recent decades have seen this trend reverse as governments increasingly have tested and implemented policy to decentralise their powers, with at least 80% of all states had employed some level of decentralising policy since the turn of the century (Manor 1999). It was no longer a growing trend but a new norm in the political landscape. Despite its popularity, decentralisation has not been universally accepted as a positive evolution in state structure. Countless studies have debated the ability for such policy to improve public sector efficiency, and this contentiousness comes out of a heterogeneity of results from across the world as well as a broad definition that has pulled vastly different concepts under one umbrella.

Faguet and Pal delineate decentralisation into four categories: deconcentration, delegation, devolution, and privatisation (2023). These streams of decentralisation lead in significantly different directions with different policy focuses and priorities. Such broad categorisation leads to inappropriate comparisons across academic literature and mixed conclusions on the impact of decentralisation, even though there may be little policy overlap between these divergent streams.

For the purpose of this study, the definition of decentralisation that will be employed will align with the devolution stream as this is the most commonly conceived version, and arguably the deepest form, of decentralisation. Both terms will be used interchangeably in this research. Borrowing once more from Faguet, decentralisation can be defined as “the devolution by central (i.e., national) government of specific functions, with all of the administrative, political, and economic attributes that these entail, to democratic local (i.e., municipal) governments that are independent of the center” (2012, 2).

A clearer definition does not clear up all the disagreement surrounding decentralisation. Advocates posit that decentralisation brings governance closer to the people, with citizens knowing more about local community needs while also being able to hold local politicians and bureaucrats accountable (Ostrom et al. 1993), and that ethnic, gender or other minorities have greater agency and reduce divisions within a state (Chattopadhyay and Duflo 2003; Faguet, Fox and Pöschl 2015). But others have argued that decentralisation may lead to less efficient public service provision due to corruption and reduced economies of scale (Prud’homme 1995), result in less qualified and

educated bureaucrats and politicians (Mill 2010), and that devolving power can lead to increased ethnic conflict and succession attempts (Roeder and Rothchild 2005).

Faguet and Pal argue that while the studied results of decentralisation remain mixed and unclear, this is primarily due to a misguided focus on proving a binary argument of whether decentralisation is an effective tool rather than analysing the necessary conditions for policy to succeed or an analysis of what types of decentralising policy are effective (2023). This study's research seeks to respond to this criticism by examining the impact of a specific strand of decentralising policy, gender quotas in local governance, on a particular area of the public sector, education, in the context of India.

## **2.2 India and the *Panchayat* System**

India pursued a radical decentralisation plan during the 1990s through the formalisation of the traditional *panchayat raj* system. Built as a three-tiered local governance system operating in rural India at the village, block, and district level, it was nationally legislated in 1992 and implemented by states throughout the next decade. It decentralised a significant swathe of public services that had previously been managed at the state or national level to local community councils that were democratically elected. Within the national legislation of this decentralised system were reservation laws that ensured each panchayat, regardless of its level, had representation from marginalised sectors of the population, including one third of seats being reserved for women.

Extensive research has been done analysing the impact of the *panchayat* system and how the reservation rate have impacted the empowerment of women, often with mixed results. The birth of independent India's route to decentralisation is often attributed to Mahatma Gandhi and his vision of *swaraj*, or self-rule (Johnson 2003). While the concept of *swaraj* primarily focuses on independence from foreign rule and pre-dates Gandhi, a key element that he focused on was not just separation from the colonial power of Britain but also self-governance at the community level. He famously wrote that "Independence begins at the bottom. Thus, every village will be a republic or *Panchayat* having full powers. It follows, therefore, that every village has to be self-sustained and capable of managing its affairs" (Gandhi 2009, 99). With independence, states across the country acknowledged the traditional and informal local councils known as *panchayats* but provided no structure for their empowerment or integration into the political ecosystem (Singh 1994). Three events were critical to the eventual formalisation and inclusion of *panchayats* through

the 73<sup>rd</sup> Amendment. The Balwantrai Mehta Commission of 1957, the Asoka Mehta Commission of 1978, and the G.V.K. Rao Committee of 1985 created a list of recommendations for the structure of panchayats, which would eventually be enshrined in the amendment, but did little to politically empower the councils beyond beginning the shift towards multiple tiers of hierarchical panchayats. The *panchayats* of the pre-amendment era were, at most, used by the governments to implement development projects without any representation or governance, which left the population disillusioned and unengaged with the system (Singh 1994).

The 73<sup>rd</sup> Amendment, also known as the *Panchayati Raj Act*, was the critical juncture for *panchayat* institutions, as it formally integrated and standardised its institutions within the broader Indian political system. The key provisions within the amendment that would define *panchayats* included a three-tier system, direct elections at five-year intervals, one-third reservations for women and proportional representation for scheduled castes and tribes, and a list of public services to be devolved from national and state governance (Swamy 1993). Each *panchayat* has its own chairperson, known as the *sarpanch* or *pradhan* depending on the state, which also have a reservation of one-third for women on rotation across all *panchayats* on that tier. For instance, every five years one third of village *panchayats* need to elect a woman as *sarpanch*, with each *panchayat* randomly assigned to which round of five-year terms they are required to reserve the position.

Once the amendment was enacted in 1993, each state had to create their own *panchayat* legislation and build their capacity to run formal, direct elections at the village level across their jurisdictions. This resulted in a staggered implementation over the next decade and extensive scholarly research on its impact across the country.

Scholarly literature on the impact of the 73<sup>rd</sup> Amendment and *panchayat raj* institutions has led in two differing directions. Some argue that it is a significant step towards deeper democracy, increased citizen engagement, and decentralised public services. The second school of thought argues that the amendment has been mostly cosmetic with few outcomes originating from local councils while state and national governments continue to guide policy even in the devolved sectors of public service.

Crook and Manor argue that since the 73<sup>rd</sup> Amendment *panchayats* have been effective in increasing accountability for both elected politicians and public bureaucrats by reducing the top-down processes of the previously more centralised systems, albeit their research was conducted in



a small number of early adoption states (1998). This is also reflected in the turnout for local elections, a critical accountability mechanism, where a World Bank study of over fifty villages found that voter turnout exceeded 90% for all sampled demographics for *panchayat* elections (Alsop et al. 2000), whereas the previous election for the *Lok Sabha*, the lower house in India's parliament, was 61% for women and 65.9% for men (Yadav 1999). When it comes to political and administrative duties, Narayana found that *sarpanches* were highly engaged in the management and maintenance of local health centres, primary schools, and other forms of public infrastructure, seeing positive outcomes in prioritised policy areas for the majority of communities he studied (2005).

Despite these positive interpretations, others have argued that there is evidence that non-elected bureaucrats have been resistant to cooperate with *panchayat* governance (Harriss 2001; Ghatak and Ghatak 2002). Political party affiliations of elected *panchayat* council members may also play a role in how public officials and state governance cooperate with the decision making of panchayats, leading to a heterogeneity of outcomes (Johnson 2003). Narayana argues that some of these cooperation and integration failures may come from a systemic failure to build capacity for governance among *panchayat* councils, resulting in leaders who struggle to fulfill their obligations and work alongside public officials (2005). Additionally, Mukarji believes state governments have been hesitant to devolve powers meaningfully due to a fear that "the system will resemble an hourglass, with the states at the narrow waist, the union [national government] power-wise broad at the top, and sub-state institutions [panchayats] function-wise broad at the bottom" (1999, 76). While *panchayats* technically may have jurisdiction over public services like education, health care, social welfare, and roads, in practical terms many *panchayats* may still have limited say due to these factors. Oommen's analysis of *panchayats* across twelve states highlights some additional pitfalls, arguing that functions are often devolved without appropriate financial and administrative support from the state, that ambiguity surrounding the demarcation of functions between *panchayats* and other levels of government leads to gaps in provision or reduced efficiency, and that taxation powers are limited for *panchayats* (1999). Taxation is a key element, as panchayats' budget comes from a mixture of local taxation and funding from national and state governments. In addition to *panchayats* struggling to meaningfully tax their communities, Vyasulu has highlighted that states have specifically struggled to devolve fiscal powers and finances (2000). With the majority of funding coming from state budgets earmarked for *panchayat* use and national

development funds, the *panchayats* are undermined in their autonomy as funding can be unilaterally increased or decreased by state or national governments even if they cannot direct the spending (Johnson 2003).

The literature thus highlights a flawed implementation of decentralisation across India, with Oommen ultimately suggesting that efforts have generally settled at merely fulfilling the mandatory provisions established by the 73rd Amendment (1999), providing communities with increased political representation and functions but still providing the state with significant power to control the intensity of implementation.

### **2.3 Panchayats and Reservation Rates**

The effect of the reservation rate policy for women has also led to significant disagreement in academic circles. On one hand, some have pointed to limited political agency for women in *panchayat raj* institutions. Ghosh et al. found that affirmative action increased representation but that women (both in their elected positions and in their household) still had limited participation in decision-making (2015). Further, they argue that elected women act on behalf of their husbands or other (male) political interests, becoming an echo of local male perspectives. Narayana has suggested that a lack of education and literacy may be the key driver of women's reliance on husbands or children to support their *panchayat* duties (2005). This leads Narayana to conclude that reservation rates as a policy for gender equality will be ineffective without an equal focus on educational attainment for women in the long-term. Chattopadhyay and Duflo, on the other hand, have argued that husbands have little impact on the policy decision-making of women *pradhans*, finding that they not only have agency to influence policy and are equally effective leaders, but that they also prioritise and enact policy that is specifically in line with the values of women in their community (2003). Even women who self-reported a reliance on their husbands for support and advice ultimately made different policy decisions from men, which also reflected preferences and needs of women in their community. This may align with Narayana's point on education, suggesting that women rely on men specifically for administrative and technical support due to lack of education. Ghosh et al. also echo the importance of education, finding that educated women are significantly more effective leaders (2015). Another critical factor highlighted by Narayana is that male *sarpanchs* treated the position as full time, spending 25-30 days a month tending to their responsibilities, whereas women worked roughly half as many days, potentially due to household

duties (2005). He also mentions that the men get significantly more visitors from the community asking for advice or advocating for community needs. This reflects research from Duflo and Topalova, who used survey data from across 24 states to show that public perception of elected women leaders was low and villagers were less satisfied with the public goods they provided (2004). This was in spite of the authors finding that public goods and infrastructure were of higher quality and selection in *panchayats* led by women in addition to lower levels of corruption and bribes. Baviskar and Mathew also found less corruption among women in leadership across the *panchayat* system (2009). The undervaluing of women's leadership, despite higher outcomes for the community, may also speak to why it has commonly been perceived that elected women rely on males in their household to lead the *panchayat*.

Overall, the literature shows that reservation rates of women have been met in *panchayats* across India, but mixed interpretations exist on how empowered and autonomous women are in these roles. The 73<sup>rd</sup> Amendment has clearly increased descriptive representation, which Pitkin describes as representation that resembles a demographic being represented (1967), as more women are elected to positions of power. Substantive representation, defined by Pitkin as representatives acting in the interest of the demographic they represent (1967), is where the debate is more contested, primarily hinging on the extent of men impacting women leaders' priorities. The variance in studies' results on this topic may be attributed to how long after the reservation rate was implemented that they were conducted or the regions they surveyed. What is less contentious is the fact that women have been perceived as less effective *panchayat* leaders despite leading quantitative research arguing otherwise.

## 2.4 Education in India

A brief history of India's education is also useful before tackling how *panchayats* interact with the country's institutions of education. Embedded in the Indian Constitution of 1950 was a commitment to "for free and compulsory education for all children until they complete the age of fourteen years" (Khosla 2012, 4), establishing education as a priority policy area for the second half of the 20<sup>th</sup> century. The Kothari Commission of 1966 established a standardised structure of schooling that furthered the commitment to the six to fourteen years age bracket, with lower primary school being the first five years of education and upper primary (or middle) school being a further three years for a total of eight years in primary education (Saxena 2021).

A struggling enrolment rate, among other underwhelming education indicators, over the first few decades of Indian independence, led to two critical events in the 1980s (Chatterjee et al. 2018). India began accepting financial support for education from the World Bank, aimed at specifically increasing enrolment and attendance rates in rural primary schools, and the National Policy on Education (NPE) of 1986 was enacted that centred the national government (rather than the states) as the driver of education development and policy implementation. Despite the NPE seemingly centralising and pulling significant power away from the states to create more broad, unified policy across India, it also established Village Education Committees (VEC), made up of parents, teachers, and community members, that would eventually fall under the jurisdiction of the local *panchayat* and give more powers after the 73<sup>rd</sup> Amendment (Upadhyay and Rajasekhar 2020). The World Bank funding would eventually be targeted into the District Primary Education Programme (DPEP), which was created alongside the 73<sup>rd</sup> Amendment and integrated with the *panchayat* system to fund education interventions at the district level. While funding came from the central government, and was distributed through the state, decisions regarding the spending of funding were made between the panchayats, their VECs, parents, and teachers. Nevertheless, this system has two drawbacks. Firstly, the national government earmarks the funding with specific boundaries of what types of interventions and investments are allowed, and the state's involvement in directing fund distribution means that districts often have insufficient budgets to implement their decisions (Varghese 1996). Thus, the effect of decentralisation is diluted even though there is significantly more community and *panchayat* engagement in education management and policy decision-making.

## 2.5 Reservation Rates and Education

As debate has continued on the effectiveness of panchayat institutions and the ability for reservation rates to empower women, little focus has been given to how gender quotas have impacted the education sector. As already mentioned, many studies have highlighted the importance of education in empowering women's voices in the panchayats. With primary education being one of the public services that has been devolved to the jurisdiction of panchayats, an important question is raised: how has decentralisation and reservation rates impacted educational attainment rates for women specifically? One study was conducted that measured the impact of women politicians being elected at the state and national level on

education (Clots-Figueras 2012), but this did not account for elections at *panchayat* level or reservation rates. Beaman et al. has been the only study that has directly analysed the effects of women *pradhans* impact on girls' education, using survey data from one district in West Bengal and comparing *panchayats* with and without a woman in the role of *pradhan* (2011). They found that *panchayats* with a woman as *pradhan* had lower school attendance for girls, but the ratio of girl-boy attendance was increased. In the surveys conducted by Chattopadhyay and Duflo (2003), women leaders in *panchayats* had distinctly different policy priorities from male counterparts, and these results are echoed in other studies on Indian women's leadership at state and national levels (Munshi and Rosenzweig 2010; Clots-Figueras 2012). These preferences were reflective of the needs of women in their community as mentioned previously, but, interestingly, they found that education was less important to women than men. Chattopadhyay and Duflo contend that this lack of prioritisation for women was due to preferences for policy areas that were closer to the experiences of women, such as access to clean water. The fact that women were responsible for collecting water for their households meant that this was critical for their day-to-day lives, whereas education was more relatable to men due to historical educational inequalities. Besides women's impact on policy, another common thread of literature argues that women leaders can serve as role models for other women in society and create an aspirational effect for girls that can challenge stereotypical gender roles (Eagly and Karau 2002; Rudman and Phelan 2010). Both Clots-Figueras (2012) and Beaman et al. (2012) suggest that this effect may be the mechanism for changes in girls' education rates in India in their studies of women in state legislatures and as *pradhans* in *panchayats*, despite showing mixed results in their analysis of girls' education.

These few studies on educational preferences and outcomes in *panchayats* rely specifically on analysis of effects of reservation rates at the level of state government or just the role of *pradhans*, who are in power for 5-year terms, but they do not capture the wider impact of devolution and reservation rates of *panchayats* as a whole. Additionally, this body of research has been limited to small regional sample sizes over short periods of time. This study seeks to measure the impact of decentralisation and reservation rates on women's education across India over a longer time period.

### 3. Methodology

While the 73<sup>rd</sup> Amendment to the Indian Constitution was enacted in 1993, each state had to develop and pass its own legislation independently, then hold elections for all three tiers of the panchayat. There were pre-existing *panchayats* across rural India, but, barring some exceptions, these traditional institutions did not carry formalised powers, lacked reserved seats for marginalised demographics, and had limited infrastructure for widespread official elections. Thus, implementation of the 73<sup>rd</sup> Amendment was not immediate as each state needed to develop the capacity for these new decentralised processes. While most states rolled out their legislation within a couple years of the national amendment, developing the election process often took longer. Some states, like Assam and Bihar, only held their first round of local elections in 2001. This meant that the public service responsibilities, including educational functions, and the reservation of women in the *panchayat* did not affect each state and district simultaneously.

To capture the impact of the decentralisation policy on women's education rates, this study will take advantage of this staggered implementation across states to conduct a difference-in-difference analysis across multiple time periods using a recent methodology developed by Callaway and Sant'Anna (2021).

#### 3.1 Data and Variables

To conduct this difference-in-difference analysis, I construct a panel dataset on educational attainment rates and *panchayat* policy implementation for all available Indian states. To quantify women's primary school completion rates for each state both before and after the 73<sup>rd</sup> Amendment, I rely on 20 rounds of randomised household survey data collected by India's National Sample Survey (NSS) between 1983-2008. The NSS has occurred annually since the 1950s and most rounds since 1983 have been digitised and are available for research purposes. While over time the survey questionnaire has become increasingly standardised, rounds have often had special-interest topics, such as manufacturing enterprises and tribal communities. Thus, not all rounds capture household-level data or observations related to education. Several rounds within the timeframe were excluded for the purposes of this study, as they did not collect relevant data or were unavailable. This specific span of time was chosen to include as many rounds of pre-implementation NSS data as possible and ends in 2008 due to 2009 introducing revolutionary

national policy that introduced free primary education for all children between six and fourteen years of age, which significantly shifted enrolment and completion rates.

For each survey round that is included, data was collected through a random sampling of households and demographic indicators were collected for each person living in the home. To quantify primary completion rates for each state, several key variables were extracted from each individual's survey responses. These variables included gender, age, state, sector, and a *General Education Code*.

Primary school completion rate for women is this study's dependent variable for the difference-in-difference analysis due to two key reasons. Firstly, primary education is the minimum educational jurisdiction for the *panchayat* system of governance. Some states decentralised certain secondary-level responsibilities to *panchayats* as well, but this is significantly less common and is not mandated by the 73<sup>rd</sup> Amendment. Secondly, as highlighted in section 2.4 on education in India, primary school has been a key focus for Indian education planning and completion rates of primary school has been a key target and indicator of progress over the last half century. This can be seen from the Kothari Commission in 1966 to the *National Policy on Education* in 1986 and, more recently, the *Right of Children to Free and Compulsory Education Act* in 2009, where the ages of six to fourteen are labelled as the years of primary education. These years of a child's life are split between lower and upper primary, but total eight years of primary school education. Thus, this study will focus on primary school completion rates for women as the outcome variable of the difference-in-difference analysis. To compile these rates per state and round, the five aforementioned variables were taken into account.

The *General Education Code* indicator captures the highest level of completed schooling for the individual. The list of potential answers for this question is not standardised across all rounds, but the variation is limited enough to allow a simple coding that follows the most common set of answers found across the 20 rounds of surveys. Within this standardised answer set, the completion rate was constructed using all responses indicating "Middle", which refers to upper primary school, or a higher level of education.

Regarding the age variable, following the historical precedent found in Indian educational policy where primary school is intended to cover the ages of 6-14, all responses for children in this age bracket or lower were excluded from the calculation of completion rate. The completion rate is further filtered through the sector variable, which indicates whether the household is placed in

an urban or rural area. With *panchayats* only existing in rural regions and urban areas having their own distinct local governance structures and legislation, it is critical to only capture data from regions relevant to the decentralisation legislation. Thus, filtering based on these variables of age and sector, as well as gender, allows for the calculation of primary school completion rates across India that are relevant to this study.

In addition to the completion rates for each state across time, the panel data also requires information on the independent variable, which is whether policy implementation has occurred or not within each state. Policy implementation is defined in this study as whether a *panchayat* board is elected to power with the legislated gender quotas enacted. To construct this element of the panel data, academic journals and official government documents are used to establish and verify when the first post-73<sup>rd</sup> Amendment election occurred for each state in the dataset. This then allows an indication for each round of NSS data whether a state had implemented the treatment or not. The list of states' first post-amendment *panchayat* election can be found in Appendix 1.

Lastly, several states and union territories are excluded from this study for various reasons. Firstly, some are omitted due to lack of data or limited data across the 20 NSS rounds. The never-treated states, of which there are five, are still included despite having two missing observations from the first two rounds of data, as they still have at least three rounds of data prior to the 73<sup>rd</sup> Amendment. Two of these states were eventually treated, but outside of the time periods included in this study, thus they can still be included in the never-treated group as established in Callaway and Sant'Anna's methodology (2021). Another reason for exclusion is that several states or union territories became independent jurisdictions within the timeframe analysed in this study, as they separated from other states. This means that no pre-trends can be established as there is no survey data that can be linked specifically to that state or territory prior to their separation. Additionally, most of these new entities came into existence after the 73<sup>rd</sup> Amendment, meaning that *panchayat raj* institutions were already established and continued their operations or immediately underwent a new round of elections. Three further states are also excluded as they already had implemented reservation rates for women within their *panchayat raj* systems prior to the 73<sup>rd</sup> Amendment. Most states already had *panchayats* before the national policy was rolled out, albeit with limited formal integration to the state political landscape, but the fact that Karnataka, Kerala, and West Bengal already had gender quotas in place disqualifies them from this study's analysis. A list of all the



states included (and excluded) in this study's analysis can be found in the aforementioned Appendix 1.

### 3.2 Empirical Strategy

Building off this panel data, this study captures the impact of the decentralisation policy by taking advantage of staggered implementation across states to conduct a difference-in-difference (DiD) analysis. In its simplest form, the DiD method captures the difference between a treated and control group by first measuring the change in the outcome variable for both groups in the pre-treatment and post-treatment time periods and then subtracting the effect in the control group from the results of the treated group. When looking at multiple, staggered treatment groups, this method becomes more complex. While a two-way fixed effects (TWFE) methodology may have previously been appropriate for this DiD design, research in the last five years has identified fundamental flaws in its robustness for multiple time periods and biased coefficients, primarily due to erroneously matching already treated units to newly treated units as a control group or counterfactual (Goodman-Bacon 2018; Borusyak et al. 2021; Chaisemartin and D'Haultfoeuille 2020). To circumvent this bias, this study will employ an alternative DiD methodology devised by Callaway and Sant'Anna (2021). Like TWFE estimators, this design allows for treatment timing variation, but critically differs in its parallel trends assumption in that it only considers never-treated units and what the authors call "Not-Yet-Treated" units, which are treated at a later point. This avoids the flaws of TWFE estimators by not employing inappropriate units, being those that are already treated, as a counterfactual when seeking to support the parallel trends assumption and estimating the effects of treatment.

To achieve this, Callaway and Sant'Anna's methodology groups all units (states) that implement treatment (*panchayat* elections that include gender quotas after the 73<sup>rd</sup> Amendment) in the same year. In this study, this results in five treatment groups which were first treated in 1994, 1995, 1996, 1997, and 2001. As NSS rounds do not always align directly with the calendar year, this study reframes time periods by NSS rounds rather than years. The five treatment groups will hereafter be referred to as five treatment waves, and the makeup of each group can be seen below in Table 1. Each of these groups are made up of at least two states except for the third wave of treatment, which only consists of Tamil Nadu. Callaway and Sant'Anna highlight that small groups, such as this round, can reduce the reliability of the resulting coefficients, but they provide

multiple aggregation tools to create more reliable results that allow for more reliable analysis (2022b). These aggregated results will be explained thoroughly in section 4.3. Additionally, I also run the same regression without Wave 3 and these full results are included in Appendix 2, showing that there is no notable divergence in results.

**Table 1: Treatment Groups**

Wave 1 (Round 50 /1994)	Wave 2 (Round 51 /1995)	Wave 3 (Round 52 /1996)	Wave 4 (Round 53 /1997)	Wave 5 (Round 56 /2001)	Never Treated
Madhya Pradesh	Andhra Pradesh	Tamil Nadu	Goa	Assam	Dadra & Nagar Haveli
Punjab	Gujarat		Manipur	Bihar	Nagaland
Tripura	Haryana		Odisha		Meghalaya
Uttar Pradesh	Himachal Pradesh		Sikkim		Mizoram
	Rajasthan				Jammu & Kashmir
	Andaman & Nicobar Islands				

The methodology devised by Callaway and Sant’Anna establishes the following parameter of interest, which is known as the Group-Time Average Treatment Effect:

$$ATT(g, t) = E[Y_t(g) - Y_t(0) | G = g] \quad \text{with } t \geq g$$

The  $ATT(g, t)$  is the average effect of treatment for a unit in group  $g$  at time period  $t$ , when  $t \geq g$ . Groups ( $g$ ) are defined as the collection of units that are treated in time period  $G$ , thus representing the group of states implementing *panchayat* policy in a particular year. “ $Y_t(g)$ ” refers to the treated outcome in time period  $t$  if the unit was treated in the time period and group  $g$ , which captures the change in women’s primary completion rate when *panchayat* boards are empowered and have seats reserved for women. “ $Y_t(0)$ ”, on the other hand, is the potential untreated outcome for the unit in time period  $t$  if it had not participated in treatment. This is the counterfactual where the treated group never decentralised. The change in completion rate in the counterfactual is then subtracted from the change in the treated group to specifically capture the impact of the decentralising *panchayat* policy. This is the ideal experiment, but it is not feasible as we cannot

know the results of primary school completion rates in an alternate, untreated environment. Instead, the parallel trends assumption is employed for a quasi-experimental design, where other states that have not experienced treatment become the counterfactual in the equation if they show similar pre-treatment trends to the groups of states that do implement decentralisation. As Callaway and Sant'Anna allow for both never-treated and not-yet-treated units in the parallel trends assumption, they establish two separate equations to account for this. Firstly, the never-treated equation, where  $C$  is an indicator variable for whether the unit is in the never-treated group:

$$E[Y_t(0) - Y_{t-1}(0)|G = g] = E[Y_t(0) - Y_{t-1}(0)|C = 1] \quad \text{with } t \geq g$$

For the not-yet-treated equation,  $C$  is replaced with  $D_s$  to indicate whether the unit has been treated by time  $t$ :

$$E[Y_t(0) - Y_{t-1}(0)|G = g] = E[Y_t(0) - Y_{t-1}(0)|D_s = 0, G \neq g] \quad \text{with } t \geq g \text{ \& } s \geq t$$

$D_s$  equates to 0 when a unit has not yet been treated and 1 when it is eventually treated, thus the equation filters out treated units. This assumption states that units that are not yet treated by time  $s$  can serve as appropriate comparisons to already treated groups. In the context of this study, this means that the later rounds of treated states can be used to establish parallel trends for the earlier groups, with Wave 1's counterfactual including trends from round 51-56 and each subsequent round of initial treatment having a smaller comparison group as the number of untreated states shrink.

Callaway and Sant'Anna's methodology allows researchers to choose either of these parallel trends assumptions based on their context or to employ both assumptions simultaneously if observations of both types of units exist in the data. These assumptions can then be adapted into the previous  $ATT(g,t)$  equation. When imposing the never-treated parallel trends assumption, we identify the  $ATT(g,t)$  with the following equation when  $t \geq g$ :

$$ATT(g, t) = E[Y_t - Y_{g-1}|G = g] - E[Y_t - Y_{g-1}|C = 1]$$

With the not-yet-treated parallel trends assumption, we can identify the  $ATT(g,t)$  by this equation instead (also with the assumption of when  $t \geq g$ ):

$$ATT(g, t) = E[Y_t - Y_{g-1}|G = g] - E[Y_t - Y_{g-1}|D_t = 0, G \neq g]$$

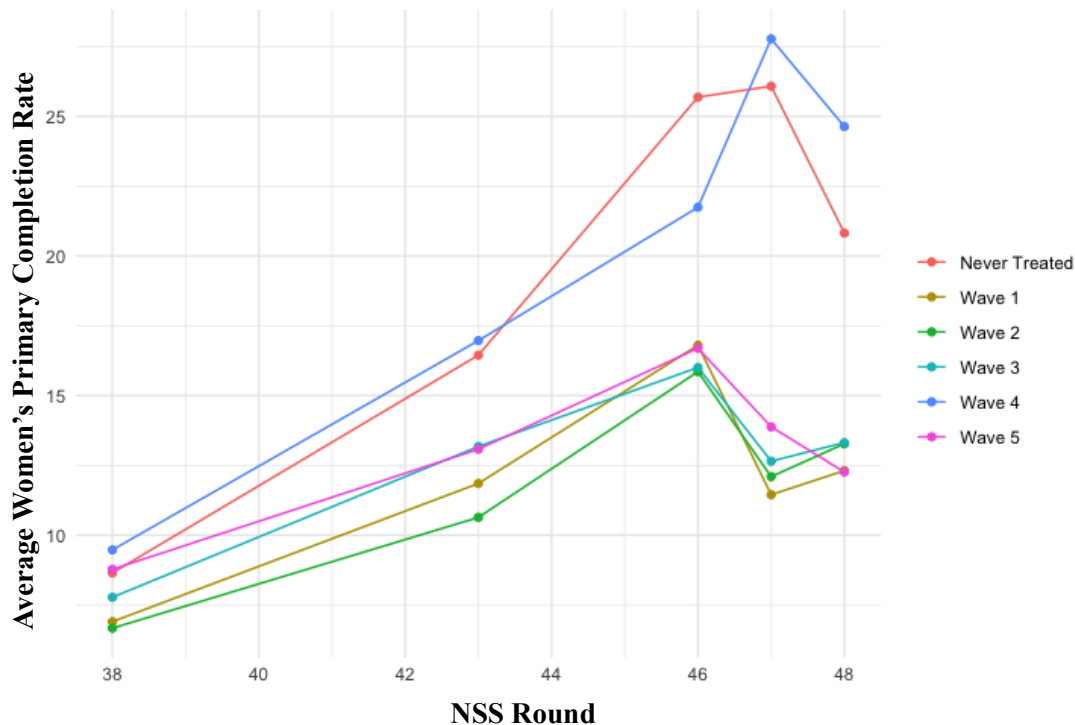
These equations result in an average treatment effect for each group and time period, meaning each treatment group of states receives a list of  $ATT(g,t)$  coefficients across the measured time period. This results in an extensive list of effects that can be difficult to effectively analyse. Additionally, as previously mentioned, the authors highlight that when dealing with small group sizes, these coefficients can become less reliable and must be cautiously interpreted (Callaway and Sant’Anna 2022b). With this in mind, they also provide multiple aggregation techniques to support deeper analysis and provide more reliable estimates. The aggregation types will be detailed further in section 4.3 and the equations for each aggregation techniques are provided in Appendix 3.

## 4. Results

### 4.1 Validating the Parallel Trends Assumption

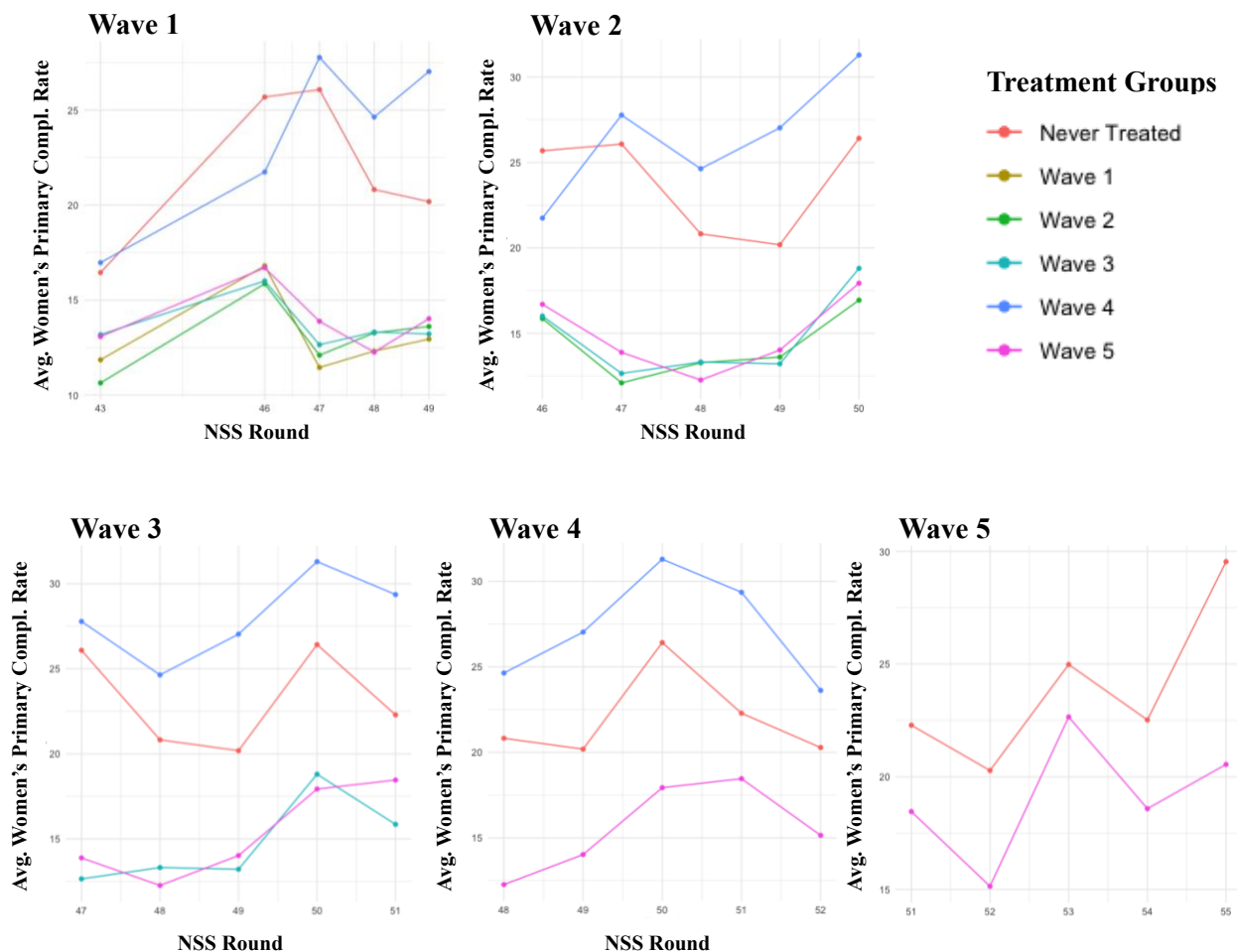
Before analysing the results, the key assumption of parallel trends needs to be assessed to validate the ability of the never-treated and not-yet-treated states to serve as an accurate counterfactual for the groups of states that received treatment at an earlier point. This can be tested in two ways: a visual comparison of women’s primary completion rates across states and assessing pseudo group-time average effects in time periods prior to treatment.

**Figure 1: 73<sup>rd</sup> Amendment Pre-trends by Treatment Group**



When looking for parallel pre-trends, there are two time periods to consider. Figure 1 shows pre-trends prior to the 73<sup>rd</sup> Amendment being announced in 1993. We can see that the five treatment groups generally follow a similar upward trend between Round 38 (1983) and Round 48 (1992), with Wave 4 deviating for Round 47 due to a brief increase in completion rate compared to the drop seen in other groups, though its rate also drops two rounds later. The never-treated control group also follows similar pre-trends to all the treatment groups before the 73<sup>rd</sup> Amendment. Thus, it can be argued, despite very slight deviation, that parallel pre-trends are observed across all treatment groups and the never-treated states.

**Figure 2: Varying Baseline Pre-Trends by Treatment Group**

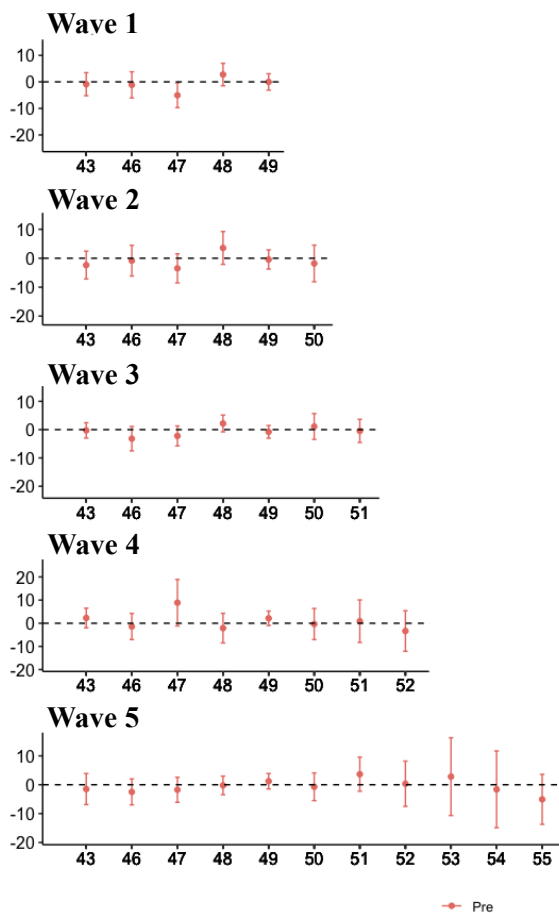


The second angle worth analysing is with varied baselines based on the timing of individual treatment groups' policy implementation to see whether parallel trends exist for each treatment group in the rounds before that group's policy implementation. Figure 2 shows the pre-trends for

each treatment group and their relevant potential counterfactuals by looking at the previous five rounds of NSS data. Each treatment group only needs to see parallel trends from the other states that are not yet treated or the never-treated states. These varying baselines unique to each treatment group highlight relatively uniform and parallel pre-trends that support the argument that unconditional parallel trends stand.

The next test looks at the pseudo group-time average effects in pre-treatment periods. If the results are statistically significant, this further strengthens the parallel trends assumption. The full table of  $ATT(g,t)$  coefficients can be found in Appendix 4, which highlights the pre-treatment round coefficients as well as post-treatment. Across all five treatment groups, the pre-treatment round  $ATT(g,t)$  effects are statistically insignificant except for Round 47 for the Wave 1 group, as can also be seen visually in Figure 3 below. Thus, we can conclude with this pre-trend test that the parallel trends assumption remains strong.

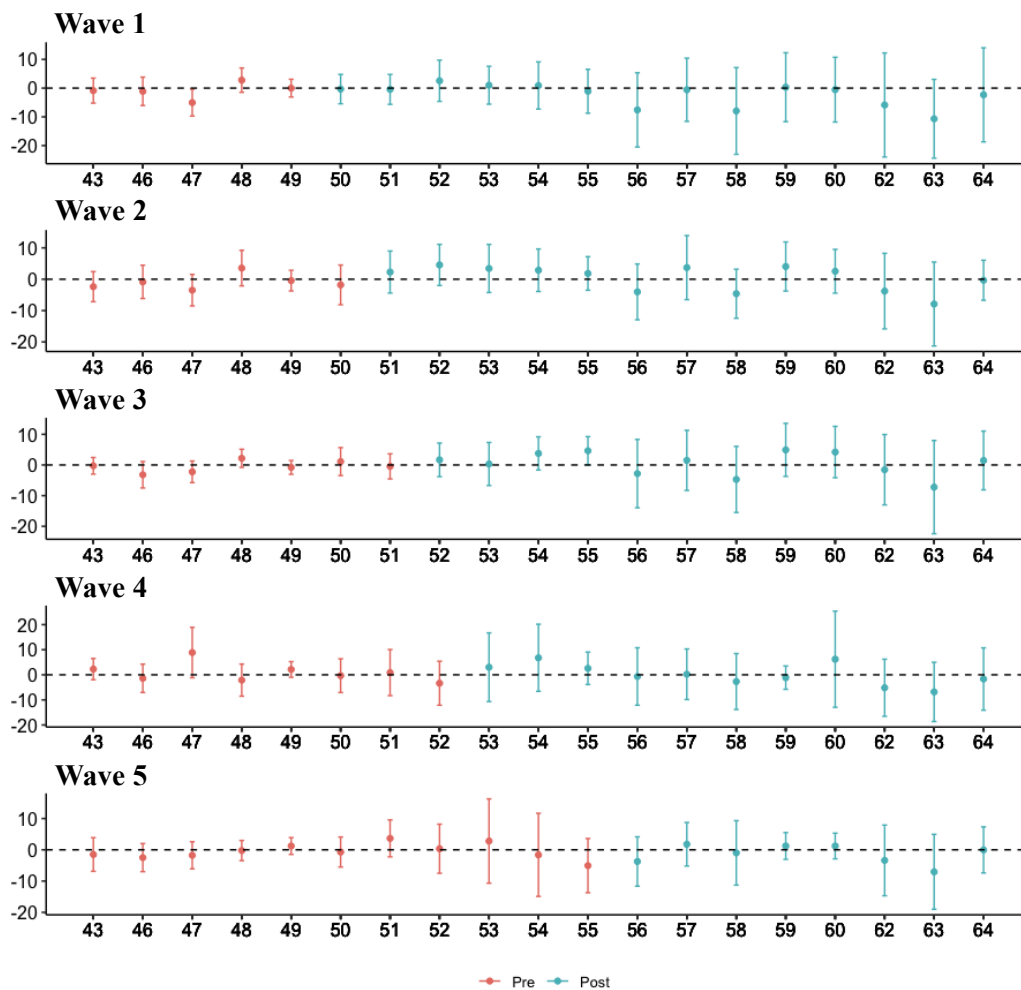
**Figure 3: Pseudo  $ATT(g,t)$  Effects in Pre-Treatment Periods**



### 4.2 Difference-in-Difference Analysis

The results of the DiD regression provides average treatment effects for each treatment group across each time period, resulting in 95 coefficients. The full table of these results can be found in Appendix 4 and a visualisation of the results can be seen in Figure 4 below. The results resoundingly show statistically insignificant results for all treatment groups, with only a couple of coefficients' confidence bands not covering zero. Amidst the results both slightly positive and negative effects are observable, highlighting that even among the statistically insignificant results there is no common trend. Thus, these initial disaggregated results infer that the decentralisation and reservation rate for women have had no noticeable effect on girls' completion of primary school across India.

**Figure 4: Group-Time Average Treatment Effects [ATT(g,t)] for Treatment Groups**



### 4.3 Aggregation

For a deeper analysis, Callaway and Sant'Anna's aggregation techniques are employed to capture results from three additional angles: a weighted average of all  $ATT(g,t)$  effects proportional to group sizes, an average treatment effect for each treatment group, and an average effect across different lengths of treatment exposure.

As seen in Table 2, the simple weighted average of all  $ATT(g,t)$  effects has a negative coefficient smaller than a single standard error, leading to a very unreliable result. This reflects the previous disaggregated results showing no statistical significance and furthers the argument that decentralising panchayat policy and reservation rates had no direct effect on women's primary school completion rates.

**Table 2: Average Group-Time Treatment Effects [ $ATT(g,t)$  Aggregation Results]**

Type	<i>ATT</i>	Std. Error	[95% Confidence Intervals]	
<b>SIMPLE</b>	-0.5638	1.2085	-2.9324	1.8048
<b>DYNAMIC</b>	-1.0598	1.4445	-3.891	1.7714
<b>GROUP</b>				
Wave 1	-2.3332	3.3588	-9.1108	4.4443
Wave 2	0.3536	1.9828	-3.6474	4.3547
Wave 3	0.5155	2.4423	-4.4127	5.4438
Wave 4	0.0596	2.7937	-5.5777	5.6969
Wave 5	-1.3675	1.6860	-4.7696	2.0346

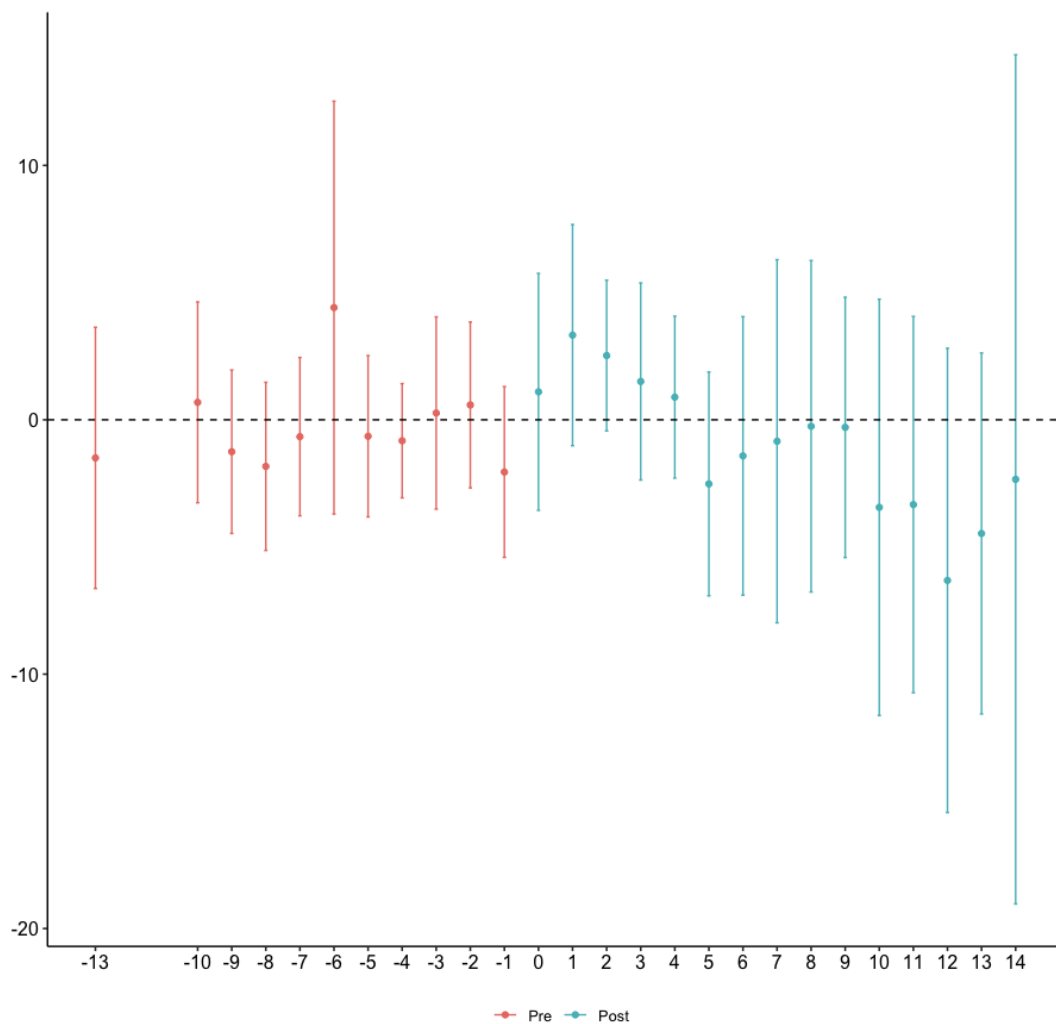
Significance codes: `\*' confidence band does not cover 0

When looking at results at an aggregated group level, providing an  $ATT(g,t)$  average for each wave of treatment, we again see large standard errors and only insignificant results in Table 2. It must be acknowledged that the Wave 1 treatment group shows a high level of variance in effect, as seen in row four of Table 2, ranging from -9.1108 to 4.4443. This most likely points to a wide heterogeneity of effects within the treatment group or that there exists an outlier in the original data that is significantly different than the rest of the group.



Lastly, the average effect of treatment across different lengths of exposure, a typical event study analysis tool, also reflects the statistically insignificant results seen previously across all lengths of treatment. The  $ATT(g,t)$  effect labelled as “Dynamic” in Table 2 is the average effect across all levels of treatment exposures. As seen in Figure 5, these results highlight the lack of direct impact of decentralising policy and gender quotas on primary school completion rates regardless of the length of exposure to treatment. While not causal, it is interesting that the initial five rounds post-treatment do show a slight uptick before dipping into the negatives. This may allude to households positively reacting to the reform and keeping their daughters in school longer, but this effect wore off after a while. Alternatively, this could be due to initial policy enacted by *panchayats*, but this would suggest that the policy changed or became less effective over time.

**Figure 5: Average Effect by Length of Exposure**



It is also noticeable that ten periods post-treatment and beyond see an even further negative dip in treatment effects. One would assume that longer exposure to treatment would hopefully increase the impact of reservation rates and a decentralised education system on women's primary completion rate, with girls getting more exposure to the role model effect and women in leadership increasing their administrative and policy-making capacities with time. Regardless, these results are also statistically insignificant, so no inferences can be conclusively drawn from these results. The considerably larger confidence band at time period fourteen could be the result of a small sample size of original units in the DiD regression that have observations so far out from treatment, which could increase the noise and variance in the results.

#### 4.4 Discussion

With no notable effect on women's primary completion rates, either positive or negative, it leaves us to wonder why this systemic overhaul of local governance and inclusion of political gender quotas has not seen results for women's education. Several arguments can be made for potential causes of this.

The most likely cause, based on the academic literature on panchayats, is that states have not meaningfully decentralised the governance of education to the *panchayats* despite their commitments to do so as laid out in the states' *panchayat* legislation and the expectations established in the 73<sup>rd</sup> Amendment. A key element in how this appears to play out is through the state's ability to control a significant portion of the budget for panchayats. While states technically cannot choose how a *panchayat's* budget is spent, they can allocate the resources amongst the *panchayats* across the state (Varghese 1996). This has resulted in *panchayats* often being underfunded and unable to enact policy that they may otherwise prioritise. Taxation is meant to increase the budgets of a *panchayat*, but the taxable capacity of their community is limited and thus provides the council with limited leeway (Oommen 1999). This potentially gives states increased bargaining power when it comes to policy creation and implementation. As highlighted previously, Mukarji points out that states fear losing out from decentralisation by devolving functions to the *panchayat*, leading to an hour-glass shape of government with the national government and the *panchayats* having most of the powers (1999). Thus, they have the motivation to limit the powers of sub-state bodies in any direct or indirect ways possible. Additionally, literature has shown that bureaucrats in some state governments resist cooperating

with the *panchayats* when implementing policy (Harriss 2001; Ghatak and Ghatak 2002) and political party affiliation can impact cooperation as well (Johnson 2003). This means that, in some form, state party politics are also informally devolved to the *panchayat* level, with states rearing their policy influence through proxies. This all amounts to the argument that *panchayats* become mostly cosmetic, while the states continue to guide most education policy, resulting in no substantial difference between the pre-treatment and post-treatment periods as seen in the event-study plot in Figure 5.

Connected to this line of thought is another argument that the lack of clear demarcation of functions between the three tiers of government and a lack of capacity building cause inefficiencies and result in *panchayats* having limited impact. Archaya's research in West Bengal provides an example of how responsibilities of the state and its *panchayats* can overlap and muddy the processes of governance (2002). The author details how functions like teacher selection are led by a sub-committee from the district *panchayat*, but also involve state education officials. In this scenario, the power of state bureaucrats in these decision-making moments is impacted by the ability of everyone else in the room to judge teaching qualifications, understand the needs of the school, and have expertise on the local education system. The capacity and training needed for the *panchayat* members to be informed and confident in leading these processes varies by district and is often severely lacking, either leading to an inefficient process or allowing the state representative to dominate proceedings. The *panchayats* often choose the latter option and defer authority to the bureaucrats or their aligned state political party to make decisions, even though they officially lead the decision-making process. This has caused multiple studies to recommend further training for those involved in *panchayats*, particularly women as they are often the least educated on the councils (Naryana 2005; Ghosh et al. 2015; Upadhyay and Rajasekhar 2020). It also speaks to the inequality in the *panchayats*, as women have less education and training than their male counterparts, which further impacts their ability to make informed policy decisions.

It may also be that Chattopadhyay and Duflo's evidence of women *pradhans* prioritising other policy areas (2003) can be extrapolated beyond the scope of their study and speak to all reserved seats for women in *panchayat* institutions. Women may simply not focus on girls' education in their policy preferences, as they suggest, and this could explain the slightly negative aggregated coefficients and the negative coefficients in the later post-treatment periods of the

event-study plot, while still remembering that these effects are all statistically insignificant. Women may redirect focus on education towards other more relatable policy areas, such as clean water and road infrastructure, as highlighted by Chattopadhyay and Duflo (2003), and this could impact girls' education. More research into policy preferences of women across India would provide a more robust understanding if this may be the case, but this current research can only argue that if such an effect was happening, there is still not a significant shift in completion rates for it to make an impact, due to the insignificant results in the coefficients.

Lastly, it must also be acknowledged that India has seen a very consistent growth in women's education rates across all states, regardless of the timing of *panchayat* empowerment and women's reservation rates, with all treatment and never-treated groups' completion rates showing a consistent upward trajectory. The fact that these groups are so similarly aligned suggests that social norms on gender and education are simultaneously impacted external to women gaining positions of power in their local council. This could potentially allude to a spillover effect where the national policy announcement could have affected girls' education through the inspirational effect of having role models in positions of power, even if they operate in other jurisdictions. If such a spillover effect occurred from the national legislation, either through implementation in other states or anticipation of eventual treatment, it would have impacted the coefficients in the never-treated or not-yet-treated states. However, this would assume that households would decide the future of their children's education based on a constitutional amendment with limited to no knowledge of the timing of its application in their district. This is highly unlikely, especially when we see the never-treated states follow a similar trajectory despite being excluded from any future treatment, and thus most likely does not bias the results.

Realistically, these potential causes all play a role in explaining why decentralisation and gender quotas have thus far failed to make an impact on women's primary school completion rates. The continued influence of the state and the lack of capacity building for women most likely dampen the impact of reserved seats in *panchayat* positions and lead to results that suggest the status quo from pre-treatment periods are simply maintained after decentralisation is enacted.

While this study found that the historic 73<sup>rd</sup> Amendment has statistically not created a differential outcome, there are several fruitful avenues for future research that could deepen this analysis. Firstly, comparing the variation and intensity of treatment across states would provide

further insight into what practices have maximised the impact of women in positions of power. Additionally, as previously mentioned, a survey of women's policy preferences on a scale larger than Chattopadhyay and Duflo's research, which only surveyed two districts in two states (2003), would provide a more accurate view of what policy is being pursued by women at the *panchayat* level. These two avenues would provide further insight into the weight of the two key mechanisms of state overreach and women's preferences on education outcomes.

## 4.5 Limitations

There are several limitations to the above analysis worth briefly engaging with. The primary concern is whether the results can be interpreted causally. The quasi-experimental design of a difference-in-difference method means that causal interpretation needs to be handled carefully as the control groups for each wave of treatment cannot be guaranteed to be an accurate counterfactual. As discussed in section 4.1, unconditional parallel pre-trends can be established with relative confidence on account of a visual test for each wave of treatment and the pseudo group-time average effects for pre-treatment periods. Confidence could potentially be increased through the integration of time-invariant covariates, as Callaway and Sant'Anna's method was not designed for time varying covariates (2022b), into the regression to see if conditional parallel trends hold. However, this was beyond the feasible scope of this study and could be implemented in future research. I argue that the covariates that are most likely to impact the outcome variable would be time-varying variables such as GDP per capita, poverty rates, and unemployment, which would not be feasibly integrated in the current iteration of Callaway and Sant'Anna's design. Thus, this must be identified as an important limitation while also acknowledging that the unconditional parallel trends do hold for the purposes of this study.

Additionally, while DiD designs rely on a zero treatment anticipation assumption, Callaway and Sant'Anna allow for states to anticipate treatment but require this to be uniform across units. This would be valuable in this context as households were aware of the national 73<sup>rd</sup> Amendment for at least one year prior to their state being treated. While they had no say in the national and state legislation or in the timing of the elections, it could be argued that the knowledge of future treatment would impact households' decision to enroll their daughters in primary school or keep them in school for a longer period than previously planned. To account for this, attempts were made to source information for each election announcement across India from local newspapers

and academic literature through digital archives. Unfortunately, no data was found to clarify how much anticipation communities had of this first election and thus the study was conducted with a zero anticipation assumption. This is a limitation that could potentially be rectified in future research through field visits to archives in India or interviews, but the fact that the methodology relies on a uniform anticipation period across units would still be a limitation. Thus, for this study, the regression was run with zero anticipation and this limitation must be considered when interpreting the results.

It must also be acknowledged that treatment intensity varied across states. While the state legislation for *panchayats* all followed the guidance of the 73<sup>rd</sup> Amendment, some minor variation can be found between states. The purpose of this study was to analyse the overall effect of the national policy being implemented across India and to assess the overall treatment effects. As previously mentioned, future research could conduct a deeper analysis with a comparison of state's implementation to assess best practices for treatment.

Lastly, this study does not measure the impact and weight of potential mechanisms through which the 73<sup>rd</sup> Amendment influenced women's education, such as states' cooperation in decentralising functions, the role model effect of having women in power, and women's policy preferences. This was beyond the scope of this study and has been addressed in other research as discussed in the literature review. This study focused on analysing the aggregated effect on women's education, finding that there was no statistical difference caused by the 73<sup>rd</sup> Amendment.

## 5. Conclusion

The findings of this study reflect the mixed results throughout the academic literature, with the devolution to *panchayats* and reservation rates having no causal impact on improving women's primary school completion rates. The results of the DiD analysis show that even over longer exposures to treatment there is no impact, revealing that even across the first fifteen years there has been no shift in its effectiveness.

The literature points to mechanisms that appear to pull in multiple directions, which may suggest that they negate one another's impact and result in the lack of a noticeable effect seen in this study. The fact that states have resisted pursuing meaningful devolution through budget constraints and vague demarcation of functions (Acharya 2002) allows for the status quo of pre-

decentralisation education policy to continue. Meanwhile, the lack of training and education to build the skill capacity of women policymakers (Narayana 2005, Ghosh et al. 2015) and women's policy preferences not prioritising girls' education (Chattopadhyay and Duflo 2003) can be reasonably assumed to have further hampered any effect from the reforms. The role model effect that households experience from seeing women in power appears to increase the length of time girls remain in school according to several studies (Clots-Figueras 2012; Beaman et al. 2012). Nevertheless, in the face of the above institutional pressures, it appears to not have made a significant difference overall when aggregating the effects of the reform.

While this study cannot speak to the strength that each of these potential mechanisms may have in impacting women's education, the fact that the effects of decentralisation have not significantly changed over the first fifteen years of the 73<sup>rd</sup> Amendment's implementation suggests that a rejuvenation of the reforms may be needed to eventually achieve the initial goals established for the *panchayats*. Further research into these mechanisms is needed to understand specifically where the *panchayat* system has failed in its ability to create meaningful outcomes for women's educational attainment. Such analysis would allow for detailed policy prescriptions to invigorate the *panchayats* and further integrate them into the political institutions of India. However, several general policy initiatives are already clear from the literature discussed in this study: (1) national policy that provides increased specificity on states' obligations to devolve functions, (2) increased funding for the *panchayats* in lieu of the limitations of taxation capacity to increase autonomy, and (2) increased training services for women in the *panchayats* to develop policymaking and public service provision expertise.

Ultimately, this study adds to the broad literature on *panchayats* by showing that decentralisation has failed to impact women's primary school completion rate through the first country-wide analysis of the 73<sup>rd</sup> Amendment's staggered implementation. It highlights that the lofty vision presented by Gandhi of villages as "self-sustained and capable of managing its affairs" (2009, 99) has still not come to pass despite multiple decades of implementation, and that significant reform is still needed to provide meaningful opportunities for women to lead their communities and for girls to achieve higher levels of education.

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## Appendices

### Appendix 1: State List

Sources for all election years are included in a list of references below this table, as well as in the main References list..

State / Union Territory	First Post-Amendment Election Year	Included in Study	Rationale
Andaman and Nicobar Islands	1995	Yes	
Andhra Pradesh	1995	Yes	
Assam	2001	Yes	
Bihar	2001	Yes	
Dadra and Nagar Haveli		Yes	Never-Treated control group (treated in 2012)
Goa	1997	Yes	
Gujarat	1995	Yes	
Haryana	1995	Yes	
Himachal Pradesh	1995	Yes	
Jammu and Kashmir		Yes	Never-Treated control group (treated in 2018)
Madhya Pradesh	1994	Yes	
Manipur	1997	Yes	
Meghalaya		Yes	Never-Treated control group
Mizoram		Yes	Never-Treated control group
Nagaland		Yes	Never-Treated control group
Odisha	1997	Yes	
Punjab	1994	Yes	
Rajasthan	1995	Yes	
Sikkim	1997	Yes	
Tamil Nadu	1996	Yes	
Tripura	1994	Yes	
Uttar Pradesh	1994	Yes	
Arunachal Pradesh		No	Limited data
Chhattisgarh		No	Limited data
Daman & Diu		No	Limited data
Dekgu		No	No rural data
Jharkhand		No	No pre-trends
Karnataka		No	Self treated prior to 73rd Amendment

Kerala		No	Self treated prior to 73rd Amendment
Lakshadweep		No	Limited data
Maharashtra		No	Self treated prior to 73rd Amendment
Puducherry		No	Limited data
Telangana		No	No pre-trends
Uttarakhand		No	No pre-trends
West Bengal		No	Self treated prior to 73rd Amendment

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## Appendix 2: Alternative DiD Regression Without Tamil Nadu

### Group-Time Average Treatment Effects [ATT(g,t)] Excluding Wave 3

Group	Time	ATT	Std. Error	[ 95% Confidence Intervals]	
Wave 1	43	-0.8988	1.7735	-5.5278	3.7301
Wave 1	46	-1.3045	1.8943	-6.2487	3.6396
Wave 1	<b>47</b>	<b>-5.2301*</b>	<b>1.9563</b>	<b>-10.336</b>	<b>-0.1243</b>
Wave 1	48	2.9238	1.6857	-1.4758	7.3234
Wave 1	49	-0.067	1.2709	-3.384	3.2499
Wave 1	50	-0.2768	2.111	-5.7865	5.2328
Wave 1	51	-0.4455	2.2461	-6.3079	5.4169
Wave 1	52	2.5463	2.9964	-5.2743	10.367
Wave 1	53	1.001	2.239	-4.8427	6.8447
Wave 1	54	0.9061	3.2653	-7.6162	9.4285
Wave 1	55	-1.0959	3.0346	-9.0162	6.8244
Wave 1	56	-7.5871	4.8607	-20.2734	5.0993
Wave 1	57	-0.5833	4.1232	-11.3448	10.1783
Wave 1	58	-7.9518	5.7416	-22.9375	7.0338
Wave 1	59	0.3109	4.6614	-11.8552	12.4771
Wave 1	60	-0.5376	4.3886	-11.9919	10.9167
Wave 1	62	-5.8721	7.0182	-24.1897	12.4455
Wave 1	63	-10.6738	4.9971	-23.7162	2.3686
Wave 1	64	-2.3415	6.5759	-19.5046	14.8217
Wave 2	43	-2.4306	1.8471	-7.2514	2.3903
Wave 2	46	-1.0466	2.0296	-6.3438	4.2505
Wave 2	47	-3.6968	1.9534	-8.7951	1.4014
Wave 2	48	3.7547	2.1794	-1.9335	9.443
Wave 2	49	-0.4969	1.3474	-4.0137	3.0199
Wave 2	50	-1.7619	2.5245	-8.3508	4.827
Wave 2	51	2.2522	2.3512	-3.8845	8.3888
Wave 2	52	4.5568	2.186	-1.1485	10.2622
Wave 2	53	3.4312	2.9554	-4.2825	11.1448
Wave 2	54	2.8655	2.547	-3.7823	9.5133
Wave 2	55	1.8313	1.945	-3.2452	6.9077
Wave 2	56	-4.0346	3.0802	-12.0739	4.0047
Wave 2	57	3.7048	3.6678	-5.8682	13.2778
Wave 2	58	-4.6193	2.8936	-12.1715	2.9329
Wave 2	59	4.0577	2.7966	-3.2414	11.3568
Wave 2	60	2.5394	2.7536	-4.6476	9.7263
Wave 2	62	-3.7863	4.2406	-14.8543	7.2817

Wave 2	63	-7.9054	5.0118	-20.9861	5.1753
Wave 2	64	-0.3342	2.5567	-7.0071	6.3387
Wave 4	43	2.2829	1.7244	-2.2177	6.7836
Wave 4	46	-1.5956	2.1295	-7.1534	3.9623
Wave 4	47	8.8347	3.7931	-1.0652	18.7346
Wave 4	48	-2.0212	2.3986	-8.2816	4.2391
Wave 4	49	2.1083	1.2512	-1.1574	5.374
Wave 4	50	-0.275	2.8384	-7.6831	7.1331
Wave 4	51	0.8671	3.5227	-8.3272	10.0614
Wave 4	52	-3.3568	3.2237	-11.7706	5.0569
Wave 4	53	3.0175	4.9783	-9.9759	16.011
Wave 4	54	6.7805	5.3114	-7.0823	20.6433
Wave 4	55	2.5851	2.462	-3.8408	9.0109
Wave 4	56	-0.6732	4.0304	-11.1925	9.8461
Wave 4	57	0.2229	3.6894	-9.4064	9.8521
Wave 4	58	-2.683	4.5154	-14.4683	9.1023
Wave 4	59	-1.1357	1.835	-5.9249	3.6536
Wave 4	60	6.2107	6.8071	-11.5559	23.9773
Wave 4	62	-5.1659	3.9455	-15.4635	5.1318
Wave 4	63	-6.8196	4.6083	-18.8472	5.208
Wave 4	64	-1.6839	4.8494	-14.3407	10.9729
Wave 5	43	-1.5204	1.8752	-6.4146	3.3739
Wave 5	46	-2.6609	1.7719	-7.2856	1.9637
Wave 5	47	-1.8712	1.7757	-6.5059	2.7635
Wave 5	48	-0.1299	1.2653	-3.4324	3.1727
Wave 5	49	1.1836	0.9748	-1.3607	3.728
Wave 5	50	-0.6357	1.8262	-5.402	4.1306
Wave 5	51	3.6825	2.3556	-2.4657	9.8307
Wave 5	52	0.3512	2.8496	-7.0862	7.7885
Wave 5	53	2.8059	4.7299	-9.539	15.1509
Wave 5	54	-1.6061	4.803	-14.1419	10.9296
Wave 5	55	-5.0546	3.0657	-13.0562	2.947
Wave 5	56	-3.7313	2.6704	-10.701	3.2385
Wave 5	57	1.7817	2.5622	-4.9057	8.4691
Wave 5	58	-0.9827	3.7872	-10.8673	8.9018
Wave 5	59	1.2297	1.6024	-2.9527	5.4121
Wave 5	60	1.2159	1.428	-2.5112	4.943
Wave 5	62	-3.3833	4.0534	-13.9626	7.196
Wave 5	63	-7.037	4.4955	-18.7702	4.6962
Wave 5	64	-0.0329	2.3008	-6.0381	5.9723

Significance codes: '\*' confidence band does not cover 0

### Appendix 3: Aggregation Equations

Aggregation Type	Equation
Simple	$\theta_S^O := \sum_{g=2}^{\mathcal{T}} \theta_S(g)P(G = g).$
Group	$\theta_S(g) = \frac{1}{\mathcal{T} - g + 1} \sum_{t=2}^{\mathcal{T}} \mathbf{1}\{g \leq t\} ATT(g, t).$
Dynamic (Event Study)	$\theta_D(e) := \sum_{g=2}^{\mathcal{T}} \mathbf{1}\{g + e \leq \mathcal{T}\} ATT(g, g + e)P(G = g G + e \leq \mathcal{T}).$

These equations, as with the equations from the main text of this study, are sourced from Callaway and Sant'Anna (2021).

## Appendix 4: Full DiD Results

### Group-Time Average Treatment Effects [ $ATT(g,t)$ ]

Group	Time	ATT	Std. Error	[ 95% Confidence Intervals]	
Wave 1	43	-0.8725	1.6314	-5.2197	3.4747
Wave 1	46	-1.1168	1.8524	-6.0528	3.8191
Wave 1	<b>47</b>	<b>-5.0504*</b>	<b>1.7544</b>	<b>-9.7251</b>	<b>-0.3757</b>
Wave 1	48	2.7722	1.5895	-1.4632	7.0077
Wave 1	49	-0.0224	1.1584	-3.1091	3.0642
Wave 1	50	-0.3387	1.9163	-5.4448	4.7674
Wave 1	51	-0.4482	1.954	-5.6548	4.7584
Wave 1	52	2.5463	2.6894	-4.6198	9.7125
Wave 1	53	1.001	2.473	-5.5885	7.5905
Wave 1	54	0.9061	3.081	-7.3037	9.1159
Wave 1	55	-1.0959	2.8679	-8.7376	6.5458
Wave 1	56	-7.5871	4.8484	-20.5063	5.3321
Wave 1	57	-0.5833	4.1264	-11.5785	10.412
Wave 1	58	-7.9518	5.6621	-23.0392	7.1355
Wave 1	59	0.3109	4.5003	-11.6807	12.3026
Wave 1	60	-0.5376	4.2298	-11.8084	10.7333
Wave 1	62	-5.8721	6.7935	-23.9742	12.23
Wave 1	63	-10.6738	5.1457	-24.3852	3.0376
Wave 1	64	-2.3415	6.1422	-18.708	14.0251
Wave 2	43	-2.3641	1.8025	-7.1671	2.4389
Wave 2	46	-0.8386	1.9919	-6.1463	4.4691
Wave 2	47	-3.4909	1.8871	-8.5193	1.5375
Wave 2	48	3.552	2.1286	-2.12	9.2239
Wave 2	49	-0.4387	1.2369	-3.7346	2.8572
Wave 2	50	-1.8028	2.3763	-8.1349	4.5292
Wave 2	51	2.2904	2.5146	-4.41	8.9908
Wave 2	52	4.5568	2.4623	-2.0043	11.118
Wave 2	53	3.4312	2.8769	-4.2348	11.0971
Wave 2	54	2.8655	2.5434	-3.9117	9.6427
Wave 2	55	1.8313	2.0095	-3.5232	7.1857
Wave 2	56	-4.0346	3.3384	-12.9302	4.861
Wave 2	57	3.7048	3.8334	-6.5096	13.9192
Wave 2	58	-4.6193	2.935	-12.4399	3.2013
Wave 2	59	4.0577	2.9366	-3.7672	11.8826
Wave 2	60	2.5394	2.618	-4.4367	9.5154

Wave 2	62	-3.7863	4.5208	-15.8324	8.2598
Wave 2	63	-7.9054	5.0196	-21.2808	5.47
Wave 2	64	-0.3342	2.394	-6.7134	6.045
Wave 3	43	-0.2677	1.0161	-2.9753	2.44
Wave 3	46	-3.1975	1.617	-7.5061	1.1112
Wave 3	47	-2.2389	1.3237	-5.766	1.2882
Wave 3	48	2.1714	1.1105	-0.7877	5.1305
Wave 3	49	-0.7897	0.8437	-3.038	1.4585
Wave 3	50	1.1132	1.7107	-3.445	5.6715
Wave 3	51	-0.4592	1.5364	-4.5532	3.6347
Wave 3	52	1.665	2.0535	-3.8068	7.1368
Wave 3	53	0.3214	2.6325	-6.6932	7.3361
Wave 3	54	3.7682	2.0331	-1.6493	9.1857
<b>Wave 3</b>	<b>55</b>	<b>4.6317*</b>	<b>1.7327</b>	<b>0.0146</b>	<b>9.2488</b>
Wave 3	56	-2.8117	4.1813	-13.9531	8.3298
Wave 3	57	1.4955	3.6783	-8.3057	11.2968
Wave 3	58	-4.7164	4.046	-15.4973	6.0645
Wave 3	59	4.9219	3.247	-3.7299	13.5738
Wave 3	60	4.2109	3.1437	-4.1659	12.5877
Wave 3	62	-1.5442	4.3059	-13.0177	9.9294
Wave 3	63	-7.2191	5.7063	-22.4242	7.986
Wave 3	64	1.4631	3.5934	-8.1119	11.0382
Wave 4	43	2.2718	1.5891	-1.9624	6.5061
Wave 4	46	-1.3972	2.1209	-7.0486	4.2542
Wave 4	47	8.8656	3.7697	-1.1791	18.9103
Wave 4	48	-2.1205	2.4037	-8.5254	4.2844
Wave 4	49	2.1298	1.1713	-0.9913	5.251
Wave 4	50	-0.3499	2.5226	-7.0717	6.372
Wave 4	51	0.8851	3.4451	-8.2948	10.0649
Wave 4	52	-3.3568	3.2889	-12.1206	5.407
Wave 4	53	3.0175	5.1383	-10.6742	16.7092
Wave 4	54	6.7805	5.0191	-6.5935	20.1545
Wave 4	55	2.5851	2.4257	-3.8785	9.0487
Wave 4	56	-0.6732	4.2955	-12.119	10.7727
Wave 4	57	0.2229	3.7824	-9.8558	10.3015
Wave 4	58	-2.683	4.184	-13.8317	8.4657
Wave 4	59	-1.1357	1.7433	-5.7808	3.5094
Wave 4	60	6.2107	7.1948	-12.9606	25.3819
Wave 4	62	-5.1659	4.2713	-16.5472	6.2154
Wave 4	63	-6.8196	4.4294	-18.6223	4.9831

Wave 4	64	-1.6839	4.6616	-14.1053	10.7375
Wave 5	43	-1.4983	2.0193	-6.8788	3.8822
Wave 5	46	-2.4896	1.6857	-6.9813	2.0021
Wave 5	47	-1.7504	1.626	-6.083	2.5823
Wave 5	48	-0.2378	1.2112	-3.4652	2.9896
Wave 5	49	1.2175	1.0076	-1.4675	3.9024
Wave 5	50	-0.7006	1.8021	-5.5025	4.1013
Wave 5	51	3.6614	2.2168	-2.2456	9.5685
Wave 5	52	0.3512	2.9432	-7.4914	8.1937
Wave 5	53	2.8059	5.0572	-10.6696	16.2815
Wave 5	54	-1.6061	4.988	-14.8973	11.685
Wave 5	55	-5.0546	3.2525	-13.7212	3.612
Wave 5	56	-3.7313	2.962	-11.6238	4.1613
Wave 5	57	1.7817	2.6115	-5.1768	8.7402
Wave 5	58	-0.9827	3.8687	-11.2914	9.3259
Wave 5	59	1.2297	1.6024	-3.0402	5.4996
Wave 5	60	1.2159	1.5406	-2.8893	5.3211
Wave 5	62	-3.3833	4.2397	-14.6805	7.9139
Wave 5	63	-7.037	4.4955	-19.0158	4.9417
Wave 5	64	-0.0329	2.7642	-7.3984	7.3326

Significance codes: `\*` confidence band does not cover 0