All the Growth We Cannot See: Staggered Elections in World's Largest Democracy*

Prachi Mishra† Shohan Mukherjee‡ N.K. Singh§

January 30, 2026

Abstract

Electoral timing coordination represents a fundamental institutional choice with potentially significant macroeconomic consequences, yet systematic evidence remains limited. This paper exploits variation in India's multi-level electoral system to identify causal effects of synchronized elections on economic growth. We estimate the effects of simultaneous elections on real GDP growth using a novel definition of simultaneous elections and a difference-in-differences approach that accounts for heterogeneous effects across Indian states, staggered "treatment" into simultaneous elections, and switchers in and out of treatment. Our findings suggest comparatively high economic growth at both national and state-levels in the range of 1.5-5.0 percentage points when state and national elections coincide versus when staggered across India's 28 states (and 3 union territories) over 1952-2023. The findings are consistent with relatively higher post-election government expenditure, higher capital compared to revenue spending, and higher overall investment rates. These results suggest that electoral coordination can have consequences extending far beyond administrative and logistical costs of conducting elections. Our findings can inform ongoing debates about India's proposed electoral reforms, and are also relevant for broader international debates on political economy determinants of growth in emerging markets and benefits from political unions, specifically, in the case of Europe.

JEL Codes: P00, O43, O11, H11

Keywords: Simultaneous Elections, Political Business Cycle, Economic Growth

*We thank Surjit Bhalla, Niten Chandra, Bibek Debroy, Amrita Dhillon, Pami Dua, Chetan Ghate, Parikshit Ghosh, Gita Gopinath, Poonam Gupta, Subhash Kashyap, Sanjay Kothari, Shri Ram Nath Kovind, Deepak Mishra, Rakesh Mohan, Anantha Nageswaran, Arvind Panagariya, Sanjiv Puri, Raghuram Rajan, Indira Rajaraman, Shamika Ravi, Sourav Sarkar, Rohini Somanathan, Francesco Trebbi, and participants in seminars organized by the Indian Ministry of Legal Affairs, the Workshop on Contemporary Political Economy organized by King's College London and Azim Premji University and the Delhi School of Economics for helpful comments. We thank Ankita Nair for her contributions in the inital stages of the paper. Views are personal and cannot be attributed to any institution the author(s) are or were associated with in the past. All errors are our own.

†Ashoka University and Isaac Center for Public Policy: prachi.mishra@ashoka.edu.in

‡Indian Statistical Institute, Delhi Centre

§President, IEG and Chairman, Fifteenth Finance Commission: nksingh@iegindia.org

1 Introduction

The long-term economic effects of democratic systems and electoral institutions are well established.[1] However, a less explored dimension is whether the timing of elections across government levels can have economic consequences.[2] This paper exploits variation in India's complex multi-level electoral system to identify the causal effects of synchronized elections on economic growth.

In practice, many democracies coordinate elections across government levels—from federal systems like Germany and the United States to emerging markets like Indonesia and Brazil. Prior to 1872, in fact, election timings in the US were not synchronized, with state congressional elections occurring in a staggered manner. Slowly, majority of states aligned their elections with federal elections as a cost- and time-saving measure. More recently, Indonesia switched from non-simultaneous to simultaneous timing of elections based on a landmark reform in 2013, where five types of elections at different levels were to be held together ('five box' elections). Yet despite this global variation in electoral timing, systematic evidence on its economic implications remains limited.

This variation in electoral timing represents an underexplored institutional factor that could potentially affect macroeconomic outcomes through multiple channels: direct effects via restrictions on economic activity during election periods, and indirect effects through policy uncertainty and resource allocation. The most direct channels can be through restrictions on public projects, disruptions in mobility around elections, and use of government officials including teachers and the police for monitoring and conducting elections. The more indirect mechanisms could work, for example, through the effects of election timings on uncertainty about election outcomes and policies, on the economic and investment outlook, and notably, through the opportunity costs of vast monetary and non-monetary resources that tend to be employed around elections in most countries. With non-simultaneous election cycles also likely to be associated with more frequent and greater number of polls, all these channels could become magnified.

India provides an ideal natural experiment to study these questions. From 1952-1967, national and state elections were synchronized, but this coordination ended abruptly in 1968-69 when the central government dissolved multiple state assemblies under Article

[1]For long-term economic effects of democratic systems see (Acemoglu et al. (2008, 2019, 2025); Besley et al. (2010); Giuliano et al. (2013); Papaioannou and Siourounis (2008); Persson and Tabellini (2009); Rigobon and Rodrik (2005); Tabellini and Magistretti (2025)). Similarly, a significant body of literature has established the macroeconomic implications of different electoral systems (Acemoglu and Robinson (2006); Acemoglu et al. (2013); Aghion et al. (2005, 2007); Baqir (2002); Lizzeri and Persico (2001); Pagano and Volpin (2005); Persson and Tabellini (2005); Rogowski (1987); Trebbi et al. (2005)).

[2]The political science literature has explored the consequences of staggered and concurrent elections for voting behavior,for example, see Anzia (2011); Chhibber and Kollman (2009); Hainmueller and Kern (2008); Kogan et al. (2018); Rickard (2012); Sakurai and Menezes-Filho (2008).

356. Since then, elections elections are frequent and widespread in India; with an average of more than six elections per year (including both national and state elections) between 1952-2023 (Figure 1). If one were to include local elections, this figure would multiply manifold. Policymakers are now actively debating returning to synchronized elections. Commonly referred to as "One Nation, One Election" (or ONOE), the idea is to synchronize elections at all levels of governments, to be held simultaneously.[3]

This paper estimates the effects of simultaneous elections on real GDP growth. We use a novel definition of simultaneous elections, and exploit variation between cases of simultaneous and non-simultaneous elections both nationally and within states. At the national level, we define simultaneous elections as those electoral cycles, where a large fraction of states had state elections coinciding with national elections, and adopt a difference-in-difference (DID) methodology with both discrete and continuous treatment (Callaway et al. (2025)).[4]

The analysis at the state-level defines a given state-election cycle to be simultaneous, if that state assembly (Vidhan Sabha) election happens to fall in the same calendar year as the national elections of the lower house (Lok Sabha). The advantage of this approach is that we are able to include the many naturally occurring simultaneous elections cycles even today, where state elections coincided with the national ones. To identify causal effects, we follow De Chaisemartin and d'Haultfoeuille (2024) and Wooldridge (2023), and adopt a DID methodology to estimate the effects of simultaneous election on state-level real GDP growth. The method accounts for three key challenges in estimation. First: heterogeneity across states (or heterogeneous "treatment" into simultaneous elections). Indian states are highly diverse, with even mid-sized Indian states e.g. Gujarat and Karnataka having populations larger than major European countries like Italy and the United Kingdom. Second: staggered timing of treatment, for example, states of Assam and West Bengal got treatment into simultaneous elections in different years. Third: we also account for states that switched in and out of simultaneous elections. For example, Uttar Pradesh switched from non-simultaneous to simultaneous in 1994, and back to simultaneous in 1999. Finally, we also exploit closely contested elections at the assembly constituency level which are likely to be more unanticipated (Chatterjee and Eyigungor (2020), Girardi and Bowles (2018), Girardi (2020), Redl (2020)), and repeat the estimation for this subsample.

We find evidence for statistically and economically higher average real GDP growth at both national and state levels, post simultaneous election episodes ("treatment"), compared to non-simultaneous episodes ("control"). On average, growth increases around simultaneous elections, while it declines around non-simultaneous episodes; with a pre-

[3]See for example, "The pros and cons of simultaneous elections", The Hindu, January 29, 2024; "One Nation, One Election: Debating The Pros And Cons", LegalEdge Law School, October 6, 2023.

[4]See, for example, Alesina et al. (1992) and Drazen (2000) for a survey.

post difference in real GDP growth of of 1.5 pp. The results from the continuous treatment method suggests that as more and more states experience elections simultaneously with national cycles, growth tends to be higher. A 10 p.p. increase in the share of states having Vidhan Sabha simultaneously with the Lok Sabha, is associated with a rough 2.5 p.p. higher growth rate. The state-level analysis also confirms a relatively higher and statistically significant impact on state-level real GDP growth immediately after simultaneous elections, the effects of which subside after 3-4 years. We estimate an average treatment on the treated effect in the first year after a state election of 5 pp.

We also document stylized facts on several mechanisms consistent with our findings. First: on average, we find relatively higher fiscal deficit and public spending, second: public spending to be skewed toward capital (compared with current), and third: overall investment to be relatively higher post simultaneous election episodes. The mechanisms (see Figure 2) we document could be consistent with both direct channels: non-simultaneous elections imply – more days under the Model Code of Conduct (MCC) with restrictions on public projects and economic activity, higher teacher absenteeism, greater use of public schools, and police and paramilitary forces; and also through indirect channels operating through increased uncertainty, or greater opportunity costs of resources employed in elections and delays in decision making.

Taken together, the different pieces of evidence point in the same direction, and suggest that simultaneity of elections can be macro critical, with far reaching economic implications, beyond administrative costs and logistics of conducting elections.

The paper relates to the broader international political economy literature on political business cycles (see Section 2). We also contribute to the literature in finance on corporate decision making under uncertainty, with elections as key uncertainty-inducing events. Our findings could also have implications for the literature on on political economy determinants of growth in emerging markets, and for international debates on political unions, specifically, in the case of Europe.

Our main contribution is to bring out a new aspect that the existing literature has not focused on, which is the effects of coordination in electoral timings. To our knowledge, this is the first study to exploit differences across simultaneous and non-simultaneous elections to quantify the evolution of macroeconomic outcomes in a large federation.

The rest of the paper is organized as follows. Section 2 reviews the related literature. Section 3 presents the background including the experiences outside India, as well as India's current and historical context. Section 4 provides an overview of the data sources, and a first look at the data. Section 5 lays out the empirical strategy. Section 6 presents the main results with additional findings and robustness checks. Section 7 looks at aggregate effects. Section 8 provides some evidence on the mechanisms. Section 9

concludes.

2 Related Literature

The paper is related to several strands of the international political economy literature. The "political business cycle" theory goes back to Nordhaus (1975) and MacRae (1977) and highlights the "opportunistic motivation" of policymakers. According to this model, politicians stimulate aggregate demand before elections in order to create fast growth and reduce unemployment; and the inflationary consequences of this policy are eliminated by a post-electoral contraction. While there are a number of clear electoral effects on macroeconomic variables (Drazen (2000)), the empirical literature generated by the Nordhaus' paper, however, has yielded, at best, mixed results (Alesina et al. (1992); Dubois (2016)). On the other hand, a "partisan theory" of macroeconomic policy which goes back to Hibbs (1977), emphasizes policymakers' partisan motivations, and suggests different macroeconomic outcomes across political parties and administrations.[5] This paper contributes to the literature by establishing heterogeneity in macroeconomic outcomes depending on synchronicity of electoral cycles within a country, which can be particularly relevant for large federations. To our knowledge, this is the first paper to establish differences in macroeconomic outcomes across simultaneous and non-simultaneous elections in a large federation.[6]

Second, this paper also relates to a rapidly growing literature in finance on corporate decision making under uncertainty, with elections as key uncertainty-inducing events (see Campello and Kankanhalli (2024) for a review). Julio and Yook (2012), for example, using a sample of 248 national elections in 48 countries held between 1980 and 2005, show that firms in election countries reduce their investment in election years relative to non-election years. Similarly, Jens (2017a) shows similar dynamics of reduced investment around U.S. gubernatorial elections. More recently, Nguyen and Sila (2024) use multiple sources of big data on U.S. firms' job postings and employment flows to study how firms adjust the volume and nature of their hiring decisions in response to election uncertainty. Our paper highlights the role of higher uncertainty too, in our case as a key mechanism for relatively poorer outcomes around non-simultaneous elections compared to simultaneous elections.

Third, the paper could have implications for the literature on political unions (see for example Alesina et al. (2017), Breuss (2008) and Sapir and Sekkat (1999)). Harmonized electoral cycles are likely to be a key ingredient for such unions to materialize. This

[5] See also Alesina et al. (1997). See Coibion et al. (2021) for more recent evidence on political polarization and economic outcomes.

[6] In an earlier literature, Knight and Schiff (2010) exploits the Presidential primaries in the United States in 2004 to examine the differential effects of sequential versus simultaneous polls on election outcomes. They establish econometrically that candidates experience momentum effects when their electoral performance in early states exceeds expectations, and attribute this to social learning by voters.

paper establishes the economic benefits of synchronizing elections at different levels of government; and, therefore, could be relevant for the broader debate on benefits from political unions, for example, in the case of Europe.

Finally, the paper also contributes to the political economy literature in India. The paper is closely related to, and builds on Debroy and Desai (2017), who study simultaneous and non-simultaneous elections, and delve into operational and implementation issues in detail. More recently, Vaishnav et al. (2025), Agney and Thomas (2023), Kaushik and Goyal (2019) and IDFC (2016) examine the "one-nation, one-election" proposal from a political and an implementation perspective. Kaushik and Goyal (2019), for example, use electoral data to argue that a careful re-engineering of the proposal could make it workable and palatable. Importantly, Debroy and Desai (2017) note that "it is difficult to "quantify" the gains from simultaneous elections." Dubey and Sahi (2025) provide a theoretical model of voter behavior under simultaneous elections, and Balasubramaniam et al. (2025) focus on voter behavior in 10 Indian states from 1977, and find that the probability that the same party wins both at the parliamentary and local level increases during synchronous elections. Electoral data from India have also been used in several other studies that address different questions, for example, on the effect of political alignment at the constituency level (Asher and Novosad (2017)), political competition and its effects on human development in rural India (Dash and Mukherjee (2015)). Our paper, instead, looks at the economic implications of simultaneous elections, at the national and state levels. We focus on macroeconomic outcomes, dating back to India's first elections in 1952. This is where the current study offers a first contribution.

3 Institutional Background

3.1 Experience of Simultaneous Elections Outside India

The United States presently has a two step election process, involving Presidential elections every four years and Midterms at the two-year mark, but this has not historically been the case. Congress moved to standardize elections in 1872. Prior to that, states held congressional elections in a misaligned, almost staggered manner (Ferlenga and Knight (2025)). As time went on, barring five states (KY, LA, MS, NJ, and VA), all other states in the union of 50 states aligned their elections with federal elections as a cost-saving and time-saving measure.[7]

Several parliamentary democracies outside India, though comparatively small in re-

[7]In this spirit, several commentators on the Indian economy including Swaminathan Aiyar and Surjit Bhalla, have advocated for ONTE (One Nation Two Elections), similar to electoral timing patterns in the United States. This approach perhaps represents a middle ground in the transition from the current system to one featuring full simultaneous elections.

lation to India, do follow harmonized electoral cycles. Examples include South Africa, Sweden, and Belgium. In South Africa, for example, elections occur every five years, and include elections at multiple levels of government, including the national and provincial assemblies, and as well as municipal councils. In Sweden, on the other hand, county and municipal councils hold elections concurrently with general elections every four years, while municipal assemblies are elected every five years.[8] In Belgium, federal elections take place every five years, and coincide with European elections. Even in a large federation like the United States, the timings are synchronized for election of the President, the Congress, as well as for elections at local levels.[9] While the latter is a Presidential form of democracy, the example is still relevant from the perspective of potential economic effects from harmonizing election cycles, which is the focus of this study. Indonesia is another interesting example from emerging markets. It switched from non-simultaneous to simultaneous elections based on a landmark reform in 2013, where elections at five different levels were to be held together on the same day ('five box' elections). Recent developments in Taiwan further illustrate this dynamic. Large-scale recall elections effectively became quasi-general elections, sustaining prolonged campaign intensity despite their ultimate political failure.The case demonstrates how increased electoral frequency can amplify both the direct administrative burden and indirect uncertainty effects on the economy.[10]

3.2 Current Indian Context: One Nation One Election

There has been strong debate in India recently on the merits and demerits of synchronising elections. On the one hand, arguments in favour of synchronous electoral cycles hinge on costs including administrative, and logistical costs, that could be avoided or reduced through simultaneous elections. In comparison, non-simultaneous election cycles are considered synonymous with more frequent and hence greater number of polls, and often expressed in general parlance as the country being in "perennial election mode".

The challengers of the idea of harmonizing election cycles, on the other hand, have focused on the official costs of conducting elections, and argue that these are miniscule.[11] Even ignoring the opportunity costs of resources employed in elections. Much of this debate has been clouded by disagreement on the orders of magnitude for even the most

[8] See Browne et al. (1986) for a survey of Scandinavian nations that have adopted the practive.

[9] In the United States, elections for the President are held every four years, while that for the Senate and the House are held every two years – the voting for all three elections occur on the first Tuesday after the first Monday in November. Even a large number of local elections (e.g., the Mayorial elections) are synchronized to occur simultaneously.

[10] See Focus Taiwan (2026).

[11] See for example, "The argument that cost of conducting elections are extremely high seems baseless", "One nation, one election 'undemocratic' idea; high-powered panel should be dissolved", The Tribune, January 19, 2024.

explicit and measurable costs.

3.2.1 Costs of Conducting vs. Contesting Elections

Central to resolving this disagreement is a fundamental distinction that is often conflated in public discourse: the difference between two types of costs related to elections: (1) costs of conducting elections (administrative costs borne by the Election Commission) and (2) costs of contesting elections (expenditures by political parties, candidates, and related stakeholders).

Official estimates of costs of conducting elections are typically linked to expenditures incurred by the Election Commission of India (ECI). As per data provided by the Ministry of Law and Justice (2019), the official costs have remained stable over time for each Lok Sabha election: 0.05 percent of GDP in 1999, 0.03 percent of GDP in 2004, 0.02 percent of GDP in 2009 and 0.03 percent of GDP in 2014. These costs cover establishing polling places, transporting electronic voting machines (EVMs), overseeing Voter Verifiable Paper Audit Trails (VVPATs), and compensating election staff. While official cost data for Vidhan Sabha elections across all states are not centrally published, our estimates, drawing on multiple sources, suggest that conducting Vidhan Sabha elections across all states for a single cycle cost at the minimum USD 2.75 billion. [12]Combined with Lok Sabha election costs, the total administrative cost of conducting elections would exceed USD 3.3 billion at the minimum ($\tilde{0}$.09 percent of GDP for FY 2024-25 , per election cycle).

Meanwhile, the costs of contesting elections, as estimated for the 2024 Lok Sabha elections, by the Centre for Media Studies (CMS), an established non-profit organization tracking election spending for 35 years, reached USD 14.85 billion ($\tilde{0}$.5 percent of GDP), more than double the USD 6.6 billion spent in 2019.[13] These costs include political party campaign spending, media and publicity, ECI equipment, logistics and other miscellaneous expenditures.

3.2.2 Report of the High Level Committee on Simultaneous Elections

Beyond this debate, a recent report of the High level Committee on Simultaneous Elections (High Level Committee (2024))[14] discusses a myriad of ways in which the synchronicity

[12]Official figures cited by the Additional Chief Electoral Officer (ACEO) of Bihar, R Lakshmanan, indicate that the 2015 Bihar Assembly elections cost approximately USD 33 million, see The Times of India (2015). Adjusting this figure for inflation at 5 percent since then, we use it as a conservative benchmark to estimate the minimum additional cost that holding assembly elections across all states in India would entail.

[13]These estimates have been widely cited by The Economist (2024) and the Union Finance Minister (see The Times of India (2025)).

[14]The annexure to the High-Level Committee Report includes a submission by the Election Commission of India (ECI) (Annexure, Volume V, pp. 3552–3573), reports an "additional" cost however, this estimate is difficult to interpret, as the baseline against which this "additional" cost is calculated is not specified. Drawing on a synthesis of several unofficial but informative sources, we estimate that the total administrative cost of conducting elections would exceed 0.1 percent of FY25 GDP at a minimum,

of electoral cycles could have implications for the macroeconomy. These channels could be direct or some not so direct. The most direct channel is through the MCC, which puts restrictions on activities, including on public projects. Debroy and Desai (2017) have shown that in the year 2014, governance and developmental activities due to imposition of MCC remained largely suspended for about 7 months, i.e., for about 58 percent of one fiscal year cycle (April-March): 3 months across the country and 4 months across four state elections (a quarter and a third of a fiscal year cycle respectively). The number of days under the MCC, therefore, can have direct effects on public investment, fiscal deficit, and on expenditure priorities of the government.[15]

Beyond the direct channels, High Level Committee (2024) identifies uncertainty as a key indirect mechanism. Perennial elections increase uncertainty for economic agents, directly affecting their choices and influencing macroeconomic outcomes like growth and investment.

The report also outlines several other indirect channels. Political leaders operating in "permanent campaign" mode, conducting rallies and maintaining constant public contact, face severe time constraints that can bottleneck policy making and stall reforms. Combined with MCC-mandated delays, this campaign focus reduces leaders' bandwidth for broader governance issues. Additionally, political parties deploy substantial monetary and non-monetary resources in campaigns. Unlike individual candidates, parties face no expenditure ceilings and can engage in extravagant campaigning, with mounting pressure to fulfill poll promises in the social media era.[16] In addition, there can be a host of other issues. Frequent elections also impose costs on India's internal migrants (over one-third of the population), who must travel to home states to vote, incurring travel expenses and lost wages.[17]

Collectively, these costs likely dwarf official election administration expenditures. More frequent electoral cycles thus impose substantial opportunity costs on the economy, diverting resources from productive activities and potentially dampening investment and growth.

Apart from implications for the macroeconomy, there can also be consequences for

equivalent to roughly 0.1 percent of GDP per election cycle.

[15]There is plenty of anecdotal evidence on how electoral processes can stall investment projects ("General Elections: Infra projects stalled", "Indian election cash call puts strain on construction, real estate"). Kapur and Vaishnav (2013) show that the occurrence of a state election is associated with a statistically significant decline in cement consumption; though they do not find bigger declines during unscheduled elections.

[16]Unlike the limit of election expenditure imposed on a contesting candidate by the Union of India through the ECI, there is no limit on the expenditure that a party can incur during its election campaigns (see, FAQs on Election Expenditure of Political Parties). See also Report No. 255, Law Commission of India.

[17]De (2019) estimates that the number of internal migrants in India was 450 million based on the 2011 census, an increase from 30 percent of the population in 2001 to 37 percent in 2011.

society. Frequent elections could lead to recurrent polarizing campaigns to win elections, and social media can intensify some of the effects. There could be broader socio-political dimensions too (see, for example, Wani and Dar (2024)). This paper abstracts from these broader issues, and considers some of the quantifiable macroeconomic implications of synchronizing election cycles.

3.3 Political Structure of Parliament and Assemblies

The Constitution of India passed in 1950 lays down the framework for India's democratic system and provides for a Parliamentary form of government. The Supreme Court of India has described the Indian Constitution as quasi-federal because of the strong central machinery.[18]

At the Centre is the lower house of India's bicameral Parliament, the *Lok Sabha*, constitutionally the House of the People, and the upper house, the *Rajya Sabha*. Each state has its own Legislative Assembly, or the *Vidhan Sabha*. Only six states have a bicameral legislature, with two houses: the Assembly and the Council (the *Vidhan Parishad*). Elections to the Houses are governed by the Representation of the People Act, 1951. The 543 single-member parliamentary constituencies (PC henceforth) elect representatives directly to the Lok Sabha. Representatives are also elected directly to the 4,123 state legislative assembly constituencies (AC henceforth) across 28 states and 3 union territories that have legislative assemblies. The state of Uttar Pradesh has the highest number of ACs with 403 seats, while the Union Territory of Puducherry has the lowest, with 30 seats.

3.4 Plurality Rule and First-Past-The-Post (FPTP) system

The representatives directly elected from each PC and AC are chosen through a plurality voting system. Plurality systems are those where a candidate needs only to win more votes than any other candidate, and not an absolute majority. Since Indian voters have only one vote to cast for a single candidate from each constituency and the candidate with the most votes wins that constituency's election, the system is called first-past-the-post voting.

This system of voting is also followed by the United Kingdom and many erstwhile British colonies including Canada, New Zealand (till 1996), African nations such as Botswana, Eritrea, Eswatini, the Gambia, Ghana, Kenya, Nigeria, Uganda and Zambia as well as in most Caribbean countries.

[18] S.R. Bommai and others v. Union of India [(1994) 3 SCC 1], on the Federal Character of the Constitution, the Supreme Court judgement read "our Founding Fathers appear to have leaned in favor of a strong Centre ... obvious from even a cursory examination of the provisions of the Constitution."

3.5 Delimitation of Electoral Constituencies

The Delimitation Commission of India is responsible for marking the number of PCs and ACs, which are defined in proportion to the population. The total number of PC seats are fixed at 543, in proportion to the 1971 Census population.[19] At the AC level too, the number of seats are on the 1971 Census, although AC boundaries were reworked in the 2008 delimitation.[20] Our analysis employs election data at the AC level; notably the proportion of close contests at the assembly constituency level, for each state assembly election is not affected by boundary changes.

3.6 Election Timelines

The provisions for scheduling election dates are based on Section 30 of the Representation of the People Act, 1951. Elections begin with a notification from the ECI in the Gazette of India, following which candidates are given seven days to file their nominations. The nominations are scrutinized on the day after this period, and a couple more days are allowed for any withdrawals. The polling date is set no less than fourteen days after the last withdrawal. Counting must be completed, and results declared withing seven days of the completion of polling. The minimum duration from issue of the notification to the declaration of results is thirty-two days, during which the Model Code of Conduct (MCC) is in effect. If assembly elections are held asynchronously with national elections (as increasingly the case, see Table 1), the total number of days under MCC can increase. The number of days between the release of the schedule and the ECI notification can vary, in some cases reaching up to two and half months as in the 2016 Kerala State assembly polls. The 2024 Lok Sabha elections, on the other hand, had a gap of only three days.

3.7 History of Simultaneous Elections

India's electoral system dates back to the pre-Independence days of the British Empire when M.K. Gandhi's quest for universal adult suffrage was met with resistance by the Indian Franchise Committee of 1932.[21] Established "to frame a scheme for the franchise and the constituencies of the new legislatures, central and provincial, suitable for the

[19]During the Emergency, through the Constitution (Forty-second amendment) Act, 1976, any delimitation of parliamentary (PC) and assembly constituencies (AC) were supposed to be frozen until after the Census of 2001. This was done to help state governments boost family planning norms, and the date was later extended to 2026.

[20]The last Delimitation Commission of India (July 12th, 2002 - May 31st, 2008), chaired by retired Supreme Court judge, Justice Kuldip Singh, reworked boundaries of existing AC seats but did not create additional seats. This is because the Constitution (Eighty-fourth Amendment) Act, 2001 extended the current freeze on undertaking fresh delimitation up to 2026, the year in which demographers expected the population to peak.

[21]Report of the Indian Franchise Committee, Volume I (Calcutta: Government of India, Central Publication Branch, 1932).

system of responsible government", the committee also had its task cut out to delineate the polling period.

The limits to extending the polling period were obvious to the committee as was the usual practice to declare the polling day a public holiday, barring the police, medical and postal services, such that officials may be made available for polling duties. The practice at the time was to hold elections to the provincial councils and legislative assembly on the same day, as the report reasoned that "the general experience in all countries is that it is desirable, if possible, to complete all polling in a single day".

3.8 The Simultaneous Lok Sabha Episodes

The first elections in independent India took place in the backdrop of the Representation of the People Act, 1951 which provided the stipulated procedure for conducting elections to both the House of the People and the State Legislative Assemblies in Sections 14 and 15, respectively. With the Constitution coming into force, both were established at the same point in time with the first elections held simultaneously in 1951.

The implementation of synchronized elections during the 1950s and 1960s posed several challenges. After the 1952 elections, the House of the People (Lok Sabha) met in May 1952 and the legislative assemblies (Vidhan Sabhas) of various states were constituted on different dates during the period from March to May of 1952. The legislative assemblies of Assam and Orissa were the first to have their terms expire on March 3rd, 1957.[22] It was feared that letting the Lok Sabha and state legislative assemblies complete their terms in full would mean breaking the synchronicity of elections.[23]

The legislatures were also due to elect the President and Vice-President whose terms would expire on May 13th, 1957. This process would take at least a month and the outgoing members thought it appropriate to leave the task to the newly elected legislatures. With the climatic conditions of February and March being universally suitable throughout the country, all reasons pointed to the general elections being completed simultaneously before the end of March 1957 and the existing state assemblies were to be dissolved prematurely, wherever necessary.[24]

In November 1956, the Election Commission of India (ECI) in consultation with political parties at the New Delhi conference of the All-India Political Parties agreed to prematurely dissolve the state legislative assemblies of Bihar, Bombay, Madras, Mysore,

[22]The term of each House of Legislature would expire five years after its first meeting, according to articles 83(2) and 172(1) of the Constitution.

[23]Report on the Second General elections in India, 1957 (Volume I, General, Election Commission of India).

[24]The Constitution provides the powers of premature dissolution to the following individuals: Article 85 (2)(b) to the President for the Lok Sabha, Article 174 (2)(b) to the Governor of state for the state legislative assembly, and Article 356 to the President for the legislative assembly of a state under President's rule.

Punjab, Uttar Pradesh, and West Bengal.

There remained strong consensus regarding the clear benefits to both candidates and voters of having elections that were fewer and further between. This sentiment against non-simultaneous elections was echoed in the Report on the third General Election in India, 1962, stating that "it is obviously desirable that this duplication of efforts and expense should, if possible be avoided."[25]

The general elections of 1967 were the last to experience a synchronized election cycle following which the dissolution of several state assemblies led to the system becoming asynchronous. Given that the tenure of an elected House or Assembly was for a maximum of five years, not a fixed term, many state assemblies facing coalition break-ups and imminent government collapse were dissolved prematurely. For example, Odisha had four assembly elections in the span of a decade and fourteen states had up to three elections during the 1970s. Bihar, Haryana, Punjab, Rajasthan, Uttar Pradesh and West Bengal all came under President's Rule, involving suspension of the state government and imposition of direct control of the union government.[23]

The 1970s and 1980s saw a gradual transformation of the electoral landscape as more assembly elections fell out of cycle with the general elections (see Table 1) due to President's rule being imposed 63 times during this period, the highest in any such span since Independence.[26] This period was also characterized by the premature dissolution of the Fourth (1967-1970) and the Sixth (1977-1979) Lok Sabhas.

3.9 Recent Calls for Simultaneous Elections

As early as September 1982, a recommendation to return to simultaneous elections was made by the ECI with reasons ranging from considerable savings to disruption of civilian personnel and weighing down "entire administrative set up".[27] This was followed by several calls from the Law Commission of India over the following decades as well as a detailed feasibility analysis made by the Department-related Parliamentary Standing Committee on Personnel, Public Grievances, Law and Justice in 2015.[28]

The reports mentioned the key reasons for supporting simultaneous elections, including "the massive expenditure that is currently incurred for the conduct of separate elections, the policy paralysis that results from the imposition of the Model Code of Conduct (MCC) during election time, impact on delivery of essential services, burden on crucial manpower that is deployed during election time", all of which we seek to address in this paper through

[25]Report on the third General Election in India, 1962, pg 44. Refer to Annexure 1(iii).

[26]In response to a query under the Right to Information Act (RTI), the Ministry of Home Affairs reported that President's Rule was imposed 115 times till 2016. [RTI application's No MHOME/R/2016/50960 and MHOME/R/2016/80728 dated 10.04.2016 and 13.04.2016.]

[27]Election Commission of India, First Annual Report (April, 1984)

[28]In the 170th Report in 1999 and Law Commission Report (Draft), 2018, it was acknowledged that the norm should be that elections are held simultaneously.

their direct impact on macroeconomic variables.

4 Data

4.1 Data Sources

We conduct the empirical analysis using both parliamentary election cycles (1952-2023) and state assembly election cycles (1982-2023). This section describes the construction of the dataset, which combines information from several sources.

Elections: The timeline of each national and state election held between 1951 and 2022 is assembled from the Election Commission of India (ECI) website.

Simultaneous elections: As mentioned above, simultaneous elections for the Lok Sabha and the Vidhan Sabha were held for four cycles: 1951-52, 1957,1962, and 1967. Macroeconomic data, however, are not available through publicly available sources before the 1960s limiting the scope of the analysis. To circumvent this data issue, we included those election cycles in our analysis where a fraction of states above a certain threshold had their assembly elections in the year of national elections and included these in the categorization of "simultaneous" electoral cycles. We use 40 percent as a cutoff that allows us to get a reasonable number of simultaneous episodes, though our results are robust to alternative cutoffs (see Section 7). Based on the 40 percent cutoff, five election cycles are defined to be simultaneous which include the following years: 1962, 1967, 1977, 1980, and 1984-85 (Figure 3).

Simultaneous elections at the state-level: Here we define simultaneous election cycles for specific states. For a given state, if the assembly election happens to fall in the same year as the national elections of the lower house, that state election is defined to be a simultaneous election for the state. To illustrate the empirical approach, we use the state of Andhra Pradesh as an example. Figure 4 reports the four assembly elections in the state between 1983 and 1994. Only two of the four states elections, however, coincided with national elections, and were held in 1985 and 1989. Note that 1985 is also a year when many other Vidhan Sabha elections took place as given in the multiple (orange) shaded areas. For our purposes though, the fact that in 1985, Andhra Pradesh's Vidhan Sabha or state election coincided with the Lok Sabha or national election, is the criteria employed for classifying 1985 as a simultaneous cycle for Andhra Pradesh.

Close elections: In order to define closely contested election cycles, we obtain

candidate-level data on the outcomes of assembly elections held between 1982 and 2023 from the Trivedi Centre for Political Data (TCPD) at Ashoka University (Bhogale et al., 2019), which assembles publicly available data from the ECI. The data includes the number of votes obtained by each candidate and constituency. We use this data to categorize assembly constituencies which closely contested elections for each election cycle.[29]

Macroeconomic Variables: The data on several macroeconomic and fiscal variables used in the analysis are taken from the standard economic dataset of Handbook of Statistics on the Indian Economy from India's central bank, the Reserve Bank of India (RBI). The data on real GDP growth spans 1960-2023, and is taken from 'Table No. 222: Select Macro-Economic Aggregates - Growth and Investment Rates (At Constant Prices)'. Gross Fiscal Deficit (defined as excess of total expenditures over total revenues) as a percentage of GDP for the central government is taken from 'Table 232: Select Fiscal Indicators of the Central Government', and is available from 1971 to 2023. Gross Fixed Capital Formation (GFCF) (defined as net addition to the physical assets in an economy), is taken from 'Table 1: Macro-Economic Aggregates (Base Year: 2011-12 At Current Prices)', and is available for the period 1960-2023. We use GFCF as a ratio of GDP, where the latter is the "Gross Domestic Product at Market Prices", and is taken from "Table 4: Components of Gross Domestic Product".

In order to conduct our analysis at the state level, we use data on Gross State Domestic Product (GSDP) and Fiscal Deficit from a private aggregator Indiastat.com. The data goes back to 1982. Data on states' revenue and capital expenditures are collected from different editions of the Handbook of Statistics on Indian States from the RBI, from 2016-2023, and our available from 1991. To calculate revenue expenditure, figures from the tables on State-Wise Interest Payments and State-Wise Pension were added up while for capital expenditure, figures from the tables on State-Wise Capital Expenditure and State-Wise Capital Outlay were added up.

4.2 First Look at the Data

We start with a simple event study, and compare outcomes pre- and post-, around simultaneous and non-simultaneous election cycles. Simultaneous election years are assumed to be "treatment" years, while the other years are assumed to be the "control" group in the analysis.

We employ two horizons to compare the pre- and post- periods: the first one takes the

[29] Das (2023), Eggers and Hainmueller (2009), Hahn et al. (2001), Lee (2008), Sarkar (2019), Snowberg et al. (2007), and Vogl (2014) also use data on close elections at the assembly constituency level and aggregate them at the state level.

simple difference between one-year pre and one year post the election cycles (to be referred to as DiD1); while the second approach computes differences for the average values between 2-years pre and post the election years (call it DiD2). Notably, the outcomes around different episodes are aggregated over long periods of simultaneous and non-simultaneous cycles. The estimates, therefore, can be interpreted as capturing more persistent effects, while averaging out the more volatile components (see e.g., Altavilla et al. (2017)). More specifically, we define DiD1 and DiD2 for the purposes of this analysis as below:

⇒ **DiD1** - We take the difference in outcomes of the year before the election from the year after the election for each election cycle. Then, taking the grouped averages of these differences for treatment (simultaneous) and control (non-simultaneous) groups, we find the differences between these differences. This gives us the 1-year difference-in-differences (DiD1) between simultaneous and non-simultaneous elections.

⇒ **DiD2**- Here we take the average of the values 1 year and 2 years after the election and subtract it from the average of the values 1 year and 2 years before the election. Taking the average of these values separately for the treatment and control group, we find the difference between them. Hence, we get the 2-year difference-in-differences (DiD2) between simultaneous and non-simultaneous elections.

Notably, the framework differs from a standard DiD setting (with one exogenous time event, and two units – treated and control). In our framework, we compare the same unit (India in the national-level analysis) when it is treated (say, 1967) and when it is in control (say, 1971). So, the comparison is between the same unit under different event windows, as the unit is treated at t and in control at t+4. Therefore, we cannot conduct a typical parallel trend analysis. Importantly, taking differences between post- and pre- filters out any linear time trends that would affect our outcome variables.

Figure 3 reports the treated and control groups, that splits the Indian Lok Sabha election sample since 1960. The analysis includes fiscal years from 1960 till 2023. In total, 15 general election cycles are included in the sample, with 4 of them being treated and 11 elections in the control group. The key macroeconomic outcomes we analyse include GDP growth at an annual frequency.

4.3 Evolution of Growth

We start by comparing changes in real GDP growth before and after episodes of simultaneous and non-simultaneous elections. Figure 5 reports the findings for real GDP growth. The left panel in Figure 5 shows the evolution of growth around simultaneous elections,

while the right panel reports the evolution around non-simultaneous elections. 0 is the year of election. -1, -2 = 1 and 2 years before. +1, +2= 1 and 2 years after. The height of the bar in the left panel corresponding to a value of -1 on the x-axis, for example, is calculated by taking the growth 1-year before an episode and taking simple average across all simultaneous election episodes.

The red line in both the panels represents the two-year averages before and after the episodes. We see a rise in the magnitude, indicated by the red line of 0.63 p.p. in the left panel, and a fall of 0.92 p.p. in the right panel. Taking the difference, we obtain 1.55 p.p. The corresponding figures for one-year differences are +1.47 p.p. and -0.01 p.p. respectively, with a difference of 1.49 p.p. over the 1-year horizon.

What do these estimates mean? The estimates suggest that on average, real GDP growth is higher following episodes of simultaneous elections, while we find a decrease post the non-simultaneous episodes. The magnitudes suggest approximately 1.5 p.p. higher post-pre difference in growth as compared to non-simultaneous elections. To put the magnitudes in perspective, a 1.5 percent of GDP is equal to USD 54.56 billion according to FY25 GDP, half of the public spending on health, and one third of that on education. Publicly reported estimates of conducting national and state elections, beyond the official costs of conducting elections, range from 0.9-2.1 percent of FY25 GDP, which are close in orders of magnitude to our growth estimates (Kumar (2023, October 13), and Rao (2023, September 13)).

The growth rates employed above could be subject to numerous confounding factors, including weather shocks, domestic and geopolitical developments, supply shocks, and financial reforms, that affect economic growth in any given year. Taking differences, or in our case, the difference between growth rates two years pre- and post-election, allows us to eliminate effects specific to a five-year electoral cycle. This differencing strategy enables more meaningful comparisons across election cycles: for instance, we can compare a cycle from the 1960s with one from the 1990s, as period-specific factors affecting growth are differenced away. Yet, we use these yearly estimates primarily as motivating evidence.

A second concern is reverse causality: episodes of non-simultaneous elections often follow early dissolutions of state assemblies through President's Rule instituted by the central government, raising the question of whether such decisions may have been influenced by contemporaneous expectations about economic conditions. We find this channel to be less plausible. As shown in Figure A1, the number of episodes of President's Rule has drastically fallen over the decades, largely as a consequence of a decision by the Supreme Court of India to restrict arbitrary impositions of President's Rule (see *S. R. Bommai v. Union of India (1994)*).

In Section 6 below, we present alternative frameworks and further methods that allow

us to address rigorously the issues of confounding factors and reverse causality.

5 Empirical Methodology

This section outlines our empirical strategy. We conduct the analysis at the state level, exploiting variation from numerous naturally occurring election cycles in which state elections coincided with national elections. The analysis looks at 245 state assembly election cycles across 31 states. 84 of these state elections overlap with the 15 national elections in our sample period.

We classify state-election cycles with simultaneous elections as the "treated" group and those without such coincidence as the control group. For a given state, if the assembly election happens to fall in the same year as the national elections of the lower house, that state election is defined to be a simultaneous election for the state. The dependent variable is the change in Gross State Domestic Product (GSDP) growth measured over two-year horizons.

5.1 Baseline Two-Way Fixed Effects Specification

We begin by estimating a two-way fixed effects (TWFE) model. By comparing growth outcomes within states across electoral cycles, this approach isolates variation attributable to changes in simultaneity status while holding constant slow-moving structural factors at the state level. Time fixed effects further control for period-specific characteristics, including structural changes, rising uncertainty, or broader macroeconomic shifts, that could confound the estimates.

The baseline estimating equation is:

$$\Delta y_{s,t} = \beta D_{s,t} + \gamma Z_{s,t} + \alpha_s + \pi_t + \varepsilon_{s,t}, \tag{1}$$

where t indexes years, s indexes states or union territories, $\Delta y_{s,t}$ denotes the change in the outcome variable for state s in year t, and $D_{s,t}$ is an indicator equal to one if state s holds simultaneous elections in year t. The vector $Z_{s,t}$ contains time-varying state-level controls, α_s denotes state fixed effects, and π_t denotes year fixed effects. The state fixed effects control for time-invariant heterogeneity across states, while the year fixed effects absorb common shocks including changes in oil prices or global growth. The coefficient of interest, β, captures the average difference in outcome evolution between states with and without simultaneous elections.

Regressions are weighted by the states' GSDP in the initial period, 1981, to give higher weight to states with larger economic size, and to address issues of data quality, especially in smaller states. Standard errors are clustered at the state level to address any possible correlation in residuals.

5.2 Identification Challenges

The TWFE estimator faces well-documented limitations in our setting due to three key challenges: heterogeneous treatment effects, staggered treatment timing, and treatment reversal.[30]

Heterogeneous treatment effects. In a standard difference-in-differences setup, there is a single treated unit and a single control unit. In contrast, our treatment and control groups comprise highly diverse states. Even mid-sized Indian states such as Gujarat and Karnataka have populations larger than major European countries like Italy and the United Kingdom, suggesting substantial heterogeneity in treatment effects.

Staggered treatment timing. States enter simultaneous election cycles at different times. For example, Assam first held simultaneous elections in 1984, whereas West Bengal did so in 1990 (Figure 6). Comparing outcomes between these states after 1990, when both have been treated, could yield biased estimates. To correctly attribute differences to simultaneous elections, we must avoid "forbidden comparisons" (Borusyak et al., 2024).[31]

Treatment reversal. Some states switch in and out of treatment. Uttar Pradesh, for instance, held simultaneous elections in 1995 but reverted to non-simultaneous elections in 1999 (Figure 7). Standard TWFE methods cannot accommodate such dynamics.

5.3 Robust Difference-in-Differences Estimation

To address these identification challenges, we employ recent robust difference-in-differences estimators developed by De Chaisemartin and d'Haultfoeuille (2024) and Wooldridge (2023). These methods accommodate treatment effect heterogeneity, staggered adoption, and treatment reversal.[32]

The estimating equation for these models is:

$$\Delta y_{s,t} = \sum_{g,\tau} \gamma_{g,\tau} \mathbb{1}\{G_s = g, T_{s,t} = \tau\} + \alpha_s + \pi_t + \varepsilon_{s,t}, \tag{2}$$

where G_s denotes the cohort to which state s belongs (defined by the timing of initial treatment), $T_{s,t}$ denotes the number of periods since treatment for state s at time t, and $\gamma_{g,\tau}$ represents the average treatment effect for cohort g at relative time τ. The reference group consists of all not-yet-treated units.[33]

Rather than using a single treatment indicator as in Equation (1), Equation (2) in-

[30] See Goodman-Bacon (2021), Callaway and Sant'Anna (2021), Sun and Abraham (2021) and De Chaisemartin and d'Haultfoeuille (2023) for a comprehensive survey of the literature.

[31] See Section 6.2.1 for details on how these comparisons can bias our results.

[32] Section 6.3.3 discusses additional alternative estimators.

[33] We estimate dynamic treatment effects using the Stata command `did_multiplegt_dyn` developed by De Chaisemartin and d'Haultfoeuille (2024). When no covariates are included and only not-yet-treated units serve as controls, this estimator yields the same estimates as Callaway and Sant'Anna (2021).

cludes separate indicators for each cohort-by-relative-time combination. This approach groups states into cohorts based on treatment timing and duration, ensuring that comparisons are made only between appropriately similar groups. In contrast, TWFE assigns equal weight to all comparisons, including problematic ones.

The two estimators we use differ mainly in how they are implemented and how they construct comparisons between treated and untreated units. De Chaisemartin and d'Haultfoeuille (2024) build dynamic difference-in-differences estimates by carefully combining what they call "clean" comparisons across cohorts and time periods. In this approach, units that have already received the treatment are never used as controls for other treated units, which helps avoid contamination of the control group. The core objects of interest are cohort- and time-specific treatment effects, often referred to as "building-block effects" ($ATT_{g,\tau}$). Once these building blocks are obtained, a weighted average across the cohorts is taken to produce event-study estimates.

Wooldridge (2023), in contrast, follows a regression-based strategy. He uses employ fully saturated regressions (Extended TWFE) that explicitly allow treatment effects to vary across groups and over time through interaction terms. Rather than constructing effects by aggregating separate comparisons, this approach recovers dynamic treatment effects as average marginal effects derived from the estimated regression. One advantage of this framework is that it closely resembles standard regression methods that applied researchers are already familiar with. In addition, because it is formulated within a general regression setting, it can be easily extended to nonlinear models, making it suitable for outcomes that are binary, counts, or fractions, rather than only continuous variables.

6 Results

6.1 Main Findings

Table 3 summarizes our estimates. We estimate an average treatment effect on the treated (ATT) of -0.087 p.p. using the TWFE method, significantly lower in magnitude compared to estimates from the De Chaisemartin and d'Haultfoeuille (2024) and Wooldridge (2023) methods. We find larger average post-pre differences in GSDP growth for simultaneous elections, compared to non-simultaneous election episodes, consistently across both robust DID estimation methods.

Figure 9 summarizes the intertemporal effects of simultaneous elections. In the first year following an election, we find an increase in the 2-year pre-post difference in state GSDP growth rates of 4.7 percentage points using the De Chaisemartin and d'Haultfoeuille (2024) method and 4.9 percentage points using the Wooldridge (2023) method. The effect dissipates within 3-4 years after a simultaneous election,completely disappearing five

years post-election. Figure 9 also confirms the parallel trends assumption, showing no statistically distinguishable difference between treated and control groups prior to the treatment.

Overall, after accounting for the three key estimation challenges: heterogeneous effects, staggered timing, and switchers in and out, our findings are consistent across both methods.They suggest that simultaneous elections are associated with comparatively higher state-level economic growth of approximately 5.0 percentage points relative to non-simultaneous elections.

6.2 Isolating the Effects of Staggered Treatment Timing

We next isolate the effects of staggered treatment timing, by examining a sub-sample of states that excludes switchers in and out of simultaneous election treatment (e.g., cases like Uttar Pradesh in Figure 7, which switched to simultaneous elections in 1995 but returned to non-simultaneous elections in 1999). This exercise complements our baseline results by examining a setting with monotonic treatment adoption.

India's electoral history enables this analysis. Between 1996 and 1999, India experienced significant political instability marked by three Lok Sabha elections in a short span (1996, 1998, and 1999) and a succession of coalition governments. During this period, each Indian state held assembly elections simultaneously with at least one of these three Lok Sabha elections. This sequence represented the last time many state assemblies experienced simultaneous elections. Currently, only seven states experience simultaneous elections, while the rest transitioned to non-simultaneous elections in staggered fashion. The post-1999 period therefore effectively excludes states switching in and out of treatment. Importantly for our purposes, while no states reverted to simultaneous elections during this period, different states exited simultaneity at different points in time, allowing us to examine staggered treatment timing in a clean, monotonic setting.

For this exercise, we reverse the treatment definition from our baseline specification for expositional convenience, given that the majority of states in this subsample switched to non-simultaneous elections. Specifically, we define a dummy variable $D = 1$ if a state held an assembly election that did not coincide with a Lok Sabha election in the same calendar year. Under this framework, we hypothesize a negative estimated ATT. While finding a negative effect of non-simultaneous elections does not constitute independent evidence, it provides validation that our main results are robust to an alternative treatment definition.

Results from Two Way Fixed Effects (TWFE) estimator in this sub-sample suggest a statistically insignificant average treatment effect. We explore possible bias arising out of the TWFE estimator, as discussed in Goodman-Bacon (2021).

6.2.1 Bacon Decomposition

The canonical TWFE estimate can be decomposed into a weighted sum of smaller 2×2 comparisons using the Bacon decomposition following Goodman-Bacon (2021). These comparisons can be grouped into four categories:

- Early-treated (treatment) states versus never-treated (control) states
- Late-treated (treatment) versus never-treated (control) states
- Early-treated (treatment) versus late-treated (control) states before late treatment
- Late-treated (treatment) versus early-treated (control) states after late treatment

The fourth component (d) represents what Borusyak et al. (2024) refer to as "forbidden comparisons". For example, in Figure 6, West Bengal (late-treated) cannot be validly compared to Assam (early-treated) post-1990 because Assam was already treated in 1985. This comparison confounds the estimates since the control group is contaminated by prior treatment exposure. Excluding or down-weighting such "forbidden comparisons" allows us to uncover the true weighted average treatment effect on the treated. The Goodman-Bacon decomposition requires a "strongly balanced" panel and a setting where no unit switches in and out of treatment, both conditions satified by our subsample.

Figure 10 presents the Bacon decomposition of the TWFE estimate. The figure illustrates how TWFE estimates incoprorate both clean comparisons (marked in blue and green) and "forbidden comparisons" (marked in red). Notably, the forbidden comparisons bias the estimates upwards.

The treatment cohorts by year of transition to non-simultaneous elections are:

- **2001:** Assam, Kerala, Puducherry, Tamil Nadu, West Bengal
- **2002:** Goa, Gujarat, Uttar Pradesh
- **2003:** Delhi, Himachal Pradesh, Madhya Pradesh, Meghalaya, Nagaland, Rajasthan, Tripura
- **2008:** Karnataka
- **Always Treated:** Bihar, Manipur, Punjab
- **Never Treated:** Andhra Pradesh, Arunachal Pradesh, Maharashtra, Sikkim

The red marks in Figure 10 indicate forbidden comparisons where, for instance, states treated in 2003 serve as the treatment group while earlier-treated states (e.g., 2001 cohort) serve as controls. We find that these forbidden comparisons are what drive the null result, biasing our TWFE estimates in the wrong direction.

De Chaisemartin and d'Haultfoeuille (2024) essentially corrects for these "forbidden comparisons". Figure 11 presents the corrected estimates. We find a negative and statistically significant effect of transitioning into non-simultaneous elections, that is, growth is lower following non-simultaneous relative to simultaneous elections.

6.3 Additional Findings

6.3.1 Exogeneity of Election Timing

A potential concern is that election timing could be strategically influenced by economic conditions. Reverse causality could arise if non-simultaneous elections resulted from early dissolutions of state assemblies through President's Rule, a constitutional provision allowing the central government to assume direct control of a state's administration. Such dissolutions raise the question of whether timing decisions were influenced by contemporaneous expectations about economic performance.

Figure A1 documents a secular decline in President's Rule impositions over our sample period. Nevertheless, we systematically assess whether expectations about economic conditions could drive early legislative dissolutions, thereby generating non-simultaneous elections. We examine two potential channels: first, whether anticipation of strong economic growth could incentivize strategic dissolution to capitalize on favorable conditions through snap elections; second, whether poor economic performance might trigger President's Rule and consequent assembly dissolution.

Figure A2 and Table A2 present results from this analysis. We find no statistically significant correlation between the occurrence of simultaneous versus non-simultaneous elections and real GSDP growth rates across our full sample. This result is robust to the inclusion of various fixed effects, with the estimated coefficient on real GDP growth consistently near zero and statistically insignificant. These findings provide evidence against economically meaningful reverse causality, consistent with the declining use of President's Rule as a political instrument over time.

6.3.2 Exploiting Close Elections

An alternative strategy to address concerns that expected economic conditions could drive both election timing and subsequent outcomes is to focus on close elections, where outcomes are less likely to be anticipated ex ante.

We exploit closely contested elections by restricting our analysis to a subsample of unanticipated elections.[34] Following the literature, we define close elections at the assembly constituency level as those decided by a vote margin of less than 5 percent.[35] For each

[34]The finance literature uses close elections to measure the impact of elections on uncertainty. See Goodell et al. (2020), Jens (2017b), and Redl (2020), among others.

[35]See Banerjee and Iyer (2010), Afridi et al. (2023), Arulampalam et al. (2009), Crost and Kambham-

state assembly election, we compute the share of constituencies that experienced close contests. We then classify a state-election year as close if the share of constituencies with victory margins below 5 percent exceeds a predetermined threshold. Higher thresholds yield smaller subsamples of close elections, potentially reducing statistical power while sharpening identification.

We re-estimate Equation (3) to estimate the causal effects of simultaneous elections on state-level GDP growth across different samples defined by varying closeness thresholds. Table 4 reports results for the first two years following an election in the close-election subsample. The findings are qualitatively consistent with our main results, showing positive and statistically significant ATT effects on state-level growth. The estimated magnitudes are moderately smaller than our baseline estimates, likely reflecting greater uncertainty surrounding close elections. Results are broadly robust across various thresholds. As expected, increasing the threshold beyond 30 percent substantially reduces the sample size, attenuating both the magnitude and precision of the estimated effects.

Overall, our main finding of relatively higher economic growth following simultaneous elections remains robust in this close-election setting, providing additional evidence against reverse causality concerns.

6.3.3 Alternative DiD Models

This sub-section checks whether our results depend on the specific difference-in-differences estimator we use. We re-estimate the main effects using several alternative methods designed for staggered treatment timing and heterogeneous effects, and compare the results across approaches.

The seminal contribution of Goodman-Bacon (2021)demonstrated that conventional two-way fixed effects (TWFE) estimators may produce biased estimates in settings with staggered treatment adoption due to heterogeneous treatment effects and implicit negative weighting. Recent work, therefore, has proposed a range of alternative Difference-in-Differences estimators designed to restore a transparent causal interpretation. Guided by this literature, we implement several complementary approaches that recover valid average treatment effects on the treated, while differing in how they construct counterfactual outcomes and handle comparisons across cohorts and time.

Group-Time Estimators

A first class of methods relies on a group-time estimator framework. In this approach, proposed by Callaway and Sant'Anna (2021), treatment effects are identified separately for each cohort and each post-treatment period. The method compares how outcomes for a given cohort evolve after treatment relative to how outcomes evolve for an appropriate

pati (2010), Dash and Mukherjee (2015), and Mitra and Mitra (2017).

control group over the same time window. The key innovation is to anchor this comparison to the last pre-treatment period, ensuring that treated units are only compared to units not yet been treated or never treated. These cohort- and time-specific effects are then aggregated to obtain overall treatment effects of interest. This approach follows the same logic in De Chaisemartin and d'Haultfoeuille (2024) of identifying cohort-time treatment effects, but differs in how these effects are weighted when aggregating across groups, thereby offering an alternative way of summarizing heterogeneous impacts while still avoiding invalid comparisons.

Imputation-Based Estimators

A second family of estimators is based on an imputation logic. Methods proposed by Borusyak et al. (2024), Butts and Gardner (2021), and related work first use only untreated observations to estimate how outcomes would have evolved absent treatment. These estimated relationships are then used to construct counterfactual outcomes for treated units in post-treatment periods. Individual treatment effects are obtained as the difference between observed and imputed outcomes and are subsequently averaged to form an overall ATT. Relative to the group-time approach, which uses the last pre-treatment period as a reference point, imputation-based methods exploit information from all available pre-treatment periods. This choice trades flexibility for reliance on longer pre-treatment histories, but offers a conceptually simple interpretation: treated units are compared to their own predicted untreated trajectories.

Regression-Based Estimators

A third set of approaches adopts a regression-based framework, while explicitly modifying standard TWFE specifications to eliminate "forbidden comparisons," where treated units are implicitly used as controls for other treated units. The event-study estimator proposed by Sun and Abraham (2021) achieves this by interacting treatment leads and lags with cohort indicators in a fully saturated regression. This design ensures that each cohort's post-treatment outcomes are compared only to appropriate control observations, while also producing a dynamic event-study representation that allows for transparent pre-trend diagnostics. The stacked regression approach of Cengiz et al. (2019), further developed by Butts and Gardner (2021), pursues the same objective through different construction: for each treatment cohort, a clean comparison sample is formed consisting of that cohort and never-treated units, and these cohort-specific samples are stacked to estimate an overall treatment effect. While implemented differently, both approaches share the intuitive idea of creating valid control groups separately for each cohort. These estimators are similar to the regression-based, and interaction-weighted estimators developed

by Wooldridge (2021) and Wooldridge (2023).

We assess robustness in our full sample spanning 1982 to 2023 by comparing estimates obtained from these different identification strategies. Figure 12 presents point estimates and confidence intervals from each method in a unified framework. Across approaches, we find a high degree of consistency in estimated effects. Moreover, the event-study representations confirm the absence of differential pre-trends between treated and control groups in the five years preceding an election, corresponding to one full electoral cycle in the Indian context. Taken together, the convergence of results across conceptually distinct estimators strengthens our confidence that the findings are not an artifact of any single methodological choice, but instead reflect a robust causal relationship between synchronous elections and state-level economic outcomes.

7 Aggregate Effects

7.1 Difference-in-Differences with Continuous Treatment

To assess whether the state-level effects documented above translate into economically meaningful effects at the aggregate level, we relate variation in the degree of electoral simultaneity to changes in national economic performance. We do so using a difference-in-differences design with a continuous treatment, following Callaway et al. (2025) and adapting their framework to our setting. The analysis proceeds in two steps.

In the first step, we estimate the following specification:

$$\Delta y_e = \alpha_0 + \sum_{j=1}^{J} \beta_j \mathbb{1}\{D_e = d_j\} + \varepsilon_e \tag{3}$$

where the dependent variable is the two-year pre-post differences in real national GDP for each Lok Sabha election cycle. Treatment intensity is measured by the share of all Vidhan Sabha elections held concurrently with a given Lok Sabha election. Because every Lok Sabha election coincides with at least one Vidhan Sabha election, there is no fully untreated unit. We therefore normalize the coefficients relative to the lowest observed treatment intensity: three concurrent Vidhan Sabha elections, which occurs in the 1971 and 1991 Lok Sabha elections, treating this group as the omitted category.

In the second step, we summarize the estimated treatment effects by plotting a non-parametric fit of the average treatment-on-the-treated against the treatment dose.

Table 2 reports estimates from Equation (3). Under the framework of Callaway et al. (2025), the coefficients represent the average effect on the two-year change in national GDP growth for Lok Sabha elections associated with a given level of electoral simultaneity.

All estimated coefficients are positive and statistically significant at conventional levels. These estimates correspond to the $ATT(d \mid d)$—the average treatment effect for Lok Sabha elections belonging to dosage group d, where dosage is defined by the proportion of states holding simultaneous assembly elections.

Figure 8 plots these effects against the treatment dose. The figure shows that the aggregate growth effects increase with the proportion of states holding simultaneous elections, albeit at a decreasing rate. Interpreting the curve locally, the slope between any two adjacent dosage levels corresponds to the Average Causal Response (ACR) of national growth to an incremental increase in electoral simultaneity.

Following the procedure outlined in Callaway et al. (2025), we use the estimated coefficients from Equation (3) to recover this Average Causal Response. The resulting estimate implies that a 10 percentage point increase in the share of states holding elections simultaneously with the Lok Sabha is associated with a 2.5 percentage point increase in real GDP growth over the two-year pre–post window. This effect is both statistically precise and economically meaningful.

8 Potential Mechanisms

The findings in Sections 5, 6 and 7 suggest that periods of simultaneous elections in India were associated with higher economic growth, compared to periods of non-simultaneous elections. What could possibly drive these findings? In the introduction, we discussed the potential channels through which synchronicity of elections could affect ultimate outcomes. In this section, we make an attempt to quantify some of the mechanisms through which the occurrence of simultaneous elections could differentially affect the economy compared to non-simultaneous ones.

8.1 Election Frequency

The key assumption underlying the mechanisms laid out in this section is that non-simultaneous election cycles can be assumed to be associated with more frequent, and a larger number of elections compared to synchronized election cycles. Indeed, as shown in Figure 1, historically elections have been all-pervasive in India. On average, India experienced six elections per year over 1952-2023. In other words, a national or a state election occurs every two months. If we take into account time taken for election related protocol (Debroy and Desai (2017), Vaishnav et al. (2025)), on average, electoral activity would encompasses approximately 60 percent of a calendar year. If one were to include local elections, this number would multiply manifold. To summarize, Figure 1 illustrates the phenomenon of "perennial elections".

What is specifically relevant for this paper is whether the frequency of elections varied

between simultaneous and non-simultaneous episodes? In order to answer this question, we divide the period from 1952-2023 into two sub-periods: 1952-1985, which covers the time span of simultaneous elections; and 1986-2023, or the period of non-simultaneous elections. While three of more state assembly elections occurred only in 44 percent of years in the simultaneous election period; these occurred in 84 percent of the years in the non-simultaneous subsample. In contrast, while no assembly elections occurred in one-third of the years in the simultaneous election subsample, there is not a single year in the non-simultaneous period when state elections did not happen. In other words, frequent elections have become way more prevalent in the era of non-simultaneous elections.

8.2 Fiscal Deficit

As argued above, more frequent elections can directly disrupt economic activity. For example, when an election is announced at the national or at the state-level, a "Model Code of Conduct" (MCC), or a set of rules is imposed, which includes among others, restrictions on the government to lay any new ground for projects or public initiatives. More specifically, the MCC is a set of guidelines issued by the Election Commission of India to regulate political parties and candidates before elections. For elections at all levels, the MCC kicks in from a month before the start of the election dates, until the day the results are announced. This puts many regulations on usual activities, besides the protocol to be followed by political parties. The number of days lost due to the code of conduct kicking in can potentially affect decision making at all levels, including those related to public spending. Furthermore, asynchronized electoral cycles, with larger number of elections happening across different levels of government in any given year, can significantly increase the total number of days under the model code of conduct, directly reducing public expenditures, including public investment.

We start exploring this mechanism by looking at the central government fiscal deficit as a fraction of GDP. We document fiscal deficit to be higher after simultaneous elections compared to before, and this difference outpaces that in the case of non-simultaneous elections. On average, the 2-year difference-in-differences (DiD2) is 1.28 percentage points of GDP higher fiscal deficit following simultaneous elections, compared to non-simultaneous episodes.

At the outset, the result that simultaneous elections may be associated with higher fiscal deficit, and possibly higher public expenditure, may appear counterintuitive, as conventional wisdom would suggest that more frequent elections for non-simultaneous episodes should be associated with higher spending and deficits, while we find otherwise.[36] Indeed, when we compare the levels as indicated by the height of the bars, particularly,

[36] See, for example, Brender and Drazen (2008, 2013).

in the run up to the elections (-2 and -1), these are larger for non-simultaneous episodes. What we find, however, suggests that governments tend to spend relatively more after the elections, compared to before, around simultaneous election episodes, or they tend to spend relatively less before. One potential explanation for this result could be that the higher the number of elections, greater the degree of freebies and pre-election promises, which would raise government spending before the episode for non-simultaneous elections. The observed rise in government expenditure only after the episode for simultaneous elections would be consistent with a story of streamlining and higher efficiency in the electoral process. We also find a similar result when using difference-in-difference with the share of state assembly elections coinciding with Lok Sabha elections as the continuous treatment (Figure 13). The findings show that as the number of states with simultaneous elections increases, the Gross Fiscal Deficit increases by a statistically significant margin.

Higher public spending post elections is also consistent with the evidence for relatively higher growth rates post simultaneous election episodes relative to non-simultaneous ones.

8.3 Government Expenditure Priorities

How does higher government spending post simultaneous elections relate to expenditure priorities of the government? Are priorities skewed toward greater capital expenditure with better multipliers, or toward revenue expenditure (reflected partly in giveaways, freebies around elections) around synchronized electoral cycles? This sub-section explores patterns of the ratio of capital-to-revenue spending in each type of election.

We look at the difference-in-difference with continuous treatment again in Figure 14. We document a statistically significant higher Capital-to-Current Ratio (C-C ratio) as the fraction of states with assembly elections coinciding with the national elections increase. In other words, not only do the findings suggest relatively higher public spending post simultaneous election episodes but spending that is also skewed toward capital compared to revenue, again consistent with the evidence for relatively higher growth post simultaneous elections.

8.4 Uncertainty and Investment Decisions

More frequent elections can directly disrupt activity, but also indirectly affect the economy through greater uncertainty. Both these channels are likely to have implications for investment in the economy. As argued above, asynchronized electoral cycles, with larger number of elections happening across different levels of government in any given year, can significantly increase the total number of days under the model code of conduct, directly reducing public expenditures and in particular, investment. Even more importantly, the resulting uncertainties could also have spillovers for private investment, and for the broader economy too.

Our analysis does not assume or imply that simultaneous and non-simultaneous Lok Sabha elections differ intrinsically in their uncertainty levels. Rather, our central argument is that election *frequency*, not election type, drives relatively higher *aggregate* uncertainty around simultaneous elections.

Our framework rests on a straightforward premise: each election generates uncertainty. Importantly, this assumption is fully compatible with the observation that simultaneous and non-simultaneous Lok Sabha elections may generate equivalent levels of policy uncertainty. The critical distinction lies not in the type of election itself, but in the electoral calendar that emerges from misalignment. Under the current system, breaking the pattern of simultaneous elections mechanically increases the frequency of state assembly elections throughout the five-year parliamentary cycle (Figure 1 and Table 1). This creates what successive Indian governments, dating back to the Emergency era, have characterized as a system of "perennial elections."

The mechanism operates as follows: when Lok Sabha and state assembly elections are desynchronized, state elections become distributed across the intervening years rather than concentrated at a single point. This temporal dispersion generates *repeated* uncertainty shocks affecting individual states and diverts policymakers' attention from development priorities toward electoral imperatives. It is this elevated election frequency, as a structural consequence of misalignment, that constitutes the source of relatively higher "aggregate" uncertainty around simultaneous elections in our model.

To explore the evolution of investments around elections, we look at the total Gross Fixed Capital Formation (GFCF) as a fraction of GDP around simultaneous and non-simultaneous election episodes. We find that simultaneous elections are associated with higher post-pre difference in investment compared to non-simultaneous elections. On average, the pre-post difference in the ratio of GFCF to GDP is estimated at about half a percentage point higher for simultaneous election episodes compared to non-simultaneous ones, consistent with lesser interruptions in economic activity and lower uncertainty. However, when using the continuous treatment identification strategy, we do not find robust effects on investments at the national level.

9 Conclusion

This paper analyzed the effects of simultaneous election episodes in India on real GDP growth. We conducted our analysis at both the national and state levels by employing novel definitions of simultaneous elections and applying recent robust difference-in-differences estimators. For simultaneous election episodes, we find robust evidence for higher average real GDP growth at both levels of government post-elections compared to non-simultaneous election episodes. We estimate an average treatment effect on the

treated in the range of 1.5-5 percentage poits.

Crucially, our methodology addresses the bias found in standard TWFE models by isolating 'clean' comparisons and accounting for hetergoenous effects, staggered treatment timing and treatment switching. We further address potential reverse causality by exploiting closely contested elections and documenting the exogenous nature of election timing following the decline in impositions of President's Rule. The results show that while the growth effect is significant, it is intertemporal, typically dissipating within five years.

We also investigated potential mechanisms underlying these results and documented relatively higher public spending post simultaneous election episodes—spending that is skewed toward capital rather than revenue—and higher overall investment. These mechanisms are consistent with the evidence for relatively higher growth post simultaneous elections and can be explained through direct channels such as fewer days subject to election-related restrictions, as well as indirect channels operating through lower uncertainty, with spillovers from public to private investment and to the broader economy.

Our study comes with two important caveats. First, this paper abstracts from implementation and political considerations or broader societal issues when comparing simultaneous versus non-simultaneous elections, instead focusing on the economic implications. Second, frequent elections can have numerous non-quantifiable effects given data constraints, including delays in reform momentum, effects on economic and investment outlook, opportunity costs of monetary and non-monetary resources employed by political parties in campaigns, and the prevalence of corruption in election funding. While our findings are consistent with the direct channels we can quantify, they may also reflect mechanisms that are not easily quantifiable and capture opportunity costs of resources employed in frequent elections.

For India's transition to an advanced economy ("Viksit Bharat @2047"), political economy and electoral cycles will be crucial, as for any country. Our analysis suggests that election timing and electoral coordination across government levels can have consequences extending far beyond the administrative and logistical costs of conducting elections. The evidence presented in this paper illustrates the importance of incorporating electoral timing and synchronicity effects on the macroeconomy into debates on political and electoral system reforms. These results may also contribute to broader international discussions on political economy determinants of growth in emerging markets and benefits from political unions, particularly in Europe.

Bibliography

Acemoglu, D., N. Ajzenman, C. G. Aksoy, M. Fiszbein, and C. s. A. A. Q. Molina (2025): "(Successful) democracies breed their own support," *Review of Economic Studies*, 92, 621–655.

Acemoglu, D., G. Egorov, and K. Sonin (2013): "A political theory of populism," *The Quarterly Journal of Economics*, 128, 771–805.

Acemoglu, D., S. Johnson, J. A. Robinson, and P. Yared (2008): "Income and democracy," *American economic review*, 98, 808–842.

Acemoglu, D., S. Naidu, P. Restrepo, and J. A. Robinson (2019): "Democracy does cause growth," *Journal of political economy*, 127, 47–100.

Acemoglu, D. and J. A. Robinson (2006): "Economic backwardness in political perspective," *American Political Science Review*, 100, 115–131.

Afridi, F., S. Bhattacharya, A. Dhillon, and E. Solan (2023): "Electoral Competition, Electoral Uncertainty and Corruption: Theory and Evidence from India," IZA Discussion Paper 10396.

Aghion, P., A. F. Alesina, and F. Trebbi (2005): "Choosing electoral rules: theory and evidence from US cities," .

——— (2007): "Democracy, technology, and growth," .

Agney, G. and V. Thomas (2023): "Assessing the Feasibility of 'One Nation, One Election' in India," *Economic and Political Weekly*, November 11 & 18, 2023, Vol LVIII, Nos. 45 & 46.

Alesina, A., G. D. Cohen, and N. Roubini (1992): "Macroeconomic policy and elections in OECD democracies," *Economics & Politics*, 4, 1–30.

Alesina, A., N. Roubini, and G. D. Cohen (1997): *Political Cycles and the Macroeconomy*, The MIT Press.

Alesina, A., G. Tabellini, and F. Trebbi (2017): "Is Europe an Optimal Political Area?" *Brookings Papers on Economic Activity*, 169–213.

Altavilla, C., D. Giannone, and M. Modugno (2017): "Low frequency effects of macroeconomic news on government bond yields," *Journal of Monetary Economics*, 92, 31–46.

Anzia, S. F. (2011): "Election timing and the electoral influence of interest groups," *The Journal of Politics*, 73, 412–427.

Arulampalam, W., S. Dasgupta, A. Dhillon, and B. Dutta (2009): "Electoral goals and center-state transfers: A theoretical model and empirical evidence from India," *Journal of Development Economics*, 88, 103–119.

Asher, S. and P. Novosad (2017): "Politics and local economic growth: Evidence from India," *American Economic Journal: Applied Economics*, 9, 229–273.

Balasubramaniam, V., A. Y. Bhatiya, and S. Das (2025): "Synchronized elections strengthen party salience: Evidence from a decentralized democracy," *Journal of Comparative Economics*.

Banerjee, A. V. and L. Iyer (2010): "Colonial land tenure, electoral competition and public goods in India," in *Natural Experiments of History*, ed. by J. Diamond and J. Robinson, Harvard University Press, Cambridge, Ma.

Baqir, R. (2002): "Districting and government overspending," *Journal of Political Economy*, 110, 1318–1354.

Besley, T., T. Persson, and D. M. Sturm (2010): "Political competition, policy and growth: theory and evidence from the US," *The Review of Economic Studies*, 77, 1329–1352.

Bhogale, S., S. Hangal, F. R. Jensenius, M. Kumar, B. U. Nissa, and G. Verniers (2019): *TCPD-IED: TCPD Indian Elections Data v1*, Trivedi Centre for Political Data, Ashoka University.

Borusyak, K., X. Jaravel, and J. Spiess (2024): "Revisiting Event-Study Designs: Robust and Efficient Estimation," *The Review of Economic Studies*, 91, 3253–3285.

Brender, A. and A. Drazen (2008): "How Do Budget Deficits and Economic Growth Affect Reelection Prospects? Evidence from a Large Panel of Countries," *The American Economic Review*, 98, 2203–2220.

——— (2013): "Elections, leaders, and the composition of government spending," *Journal of Public Economics*, 97, 18–31.

Breuss, F. (2008): "A common election day for the euro zone?" *Kyklos*, 61, 19–32.

Browne, E. C., J. P. Frendreis, and D. W. Gleiber (1986): "Dissolution of governments in Scandinavia: A critical events perspective," *Scandinavian Political Studies*, 9, 93–107.

Butts, K. and J. Gardner (2021): "{did2s}: Two-stage difference-in-differences," *arXiv preprint arXiv:2109.05913*.

Callaway, B., A. Goodman-Bacon, and P. H. C. Sant'Anna (2025): "Difference-in-Differences with a Continuous Treatment," *American Economic Review*, conditionally accepted; forthcoming.

Callaway, B. and P. H. Sant'Anna (2021): "Difference-in-differences with multiple time periods," *Journal of econometrics*, 225, 200–230.

Campello, M. and G. Kankanhalli (2024): "Corporate decision-making under uncertainty: Review and Future Research Directions," in *Handbook of Corporate Finance*, ed. by D. J. Denis, Edward Elgar Publishing, chap. 15, 548–590.

Cengiz, D., A. Dube, A. Lindner, and B. Zipperer (2019): "The effect of minimum wages on low-wage jobs," *The Quarterly Journal of Economics*, 134, 1405–1454.

Chatterjee, S. and B. Eyigungor (2020): "Policy inertia, election uncertainty, and incumbency disadvantage of political parties," *The Review of Economic Studies*, 87, 2600–2638.

Chhibber, P. and K. Kollman (2009): "The formation of national party systems: Federalism and party competition in Canada, Great Britain, India, and the United States," in *The Formation of National Party Systems*, Princeton University Press.

Coibion, O., Y. Gorodnichenko, and M. Weber (2021): "Political Polarization and Expected Economic Outcomes," Chicago Booth Research Paper No. 20-45, Fama-Miller Working Paper.

Crost, B. and U. S. Kambhampati (2010): "Political market characteristics and the provision of educational infrastructure in North India," *World Development*, 38, 195–204.

Das, S. (2023): "Democratic backsliding in the world's largest democracy," *Available at SSRN 4512936*.

Dash, B. B. and S. Mukherjee (2015): "Political competition and human development: Evidence from the Indian states," *The Journal of Development Studies*, 51, 1–14.

De, S. (2019): "Internal migration in India grows, but inter-state movements remain low," *World Bank Blogs*.

De Chaisemartin, C. and X. d'Haultfoeuille (2024): "Difference-in-differences estimators of intertemporal treatment effects," *Review of Economics and Statistics*, 1–45.

De Chaisemartin, C. and X. d'Haultfoeuille (2023): "Two-way fixed effects and differences-in-differences with heterogeneous treatment effects: A survey," *The econometrics journal*, 26, C1–C30.

Debroy, B. and K. Desai (2017): "Analysis of Simultaneous Elections : The "What", "Why" and "How"," Working Papers id:11756, eSocialSciences.

Drazen, A. (2000): "The political business cycle after 25 years," *NBER macroeconomics annual*, 15, 75–117.

Dubey, P. and S. Sahi (2025): "Simultaneous elections in a polarized society make single-party sweeps more likely," *arXiv preprint arXiv:2503.01663*.

Dubois, E. (2016): "Political business cycles 40 years after Nordhaus," *Public choice*, 166, 235–259.

Eggers, A. C. and J. Hainmueller (2009): "MPs for sale? Returns to office in postwar British politics," *American Political Science Review*, 103, 513–533.

Ferlenga, F. and B. Knight (2025): "Vote early and vote often? Detecting electoral fraud from the timing of 19th century elections," *Journal of Public Economics*, 243, 105317.

Focus Taiwan (2026): "Budget deadlock continues as Legislature blocks review," *Focus Taiwan*.

Girardi, D. (2020): "Partisan shocks and financial markets: Evidence from close national elections," *American Economic Journal: Applied Economics*, 12, 224–252.

Girardi, D. and S. Bowles (2018): "Institution shocks and economic outcomes: Allende's election, Pinochet's coup and the Santiago stock market," *Journal of Development Economics*, 134, 16–27.

Giuliano, P., P. Mishra, and A. Spilimbergo (2013): "Democracy and reforms: evidence from a new dataset," *American Economic Journal: Macroeconomics*, 5, 179–204.

Goodell, J. W., R. J. McGee, and F. McGroarty (2020): "Election uncertainty, economic policy uncertainty and financial market uncertainty: a prediction market analysis," *Journal of Banking & Finance*, 110, 105684.

Goodman-Bacon, A. (2021): "Difference-in-differences with variation in treatment timing," *Journal of econometrics*, 225, 254–277.

Hahn, J., P. Todd, and W. Van der Klaauw (2001): "Identification and estimation of treatment effects with a regression-discontinuity design," *Econometrica*, 69, 201–209.

Hainmueller, J. and H. L. Kern (2008): "Incumbency as a source of spillover effects in mixed electoral systems: Evidence from a regression-discontinuity design," *Electoral Studies*, 27, 213–227.

Hibbs, D. A. (1977): "Political Parties and Macroeconomic Policy," *American Political Science Review*, 71, 1467–1487.

High Level Committee (2024): "Report of the High Level Committee on Simultaneous Elections, Volume I," Tech. rep., Government of India, Ministry of Law and Justice.

IDFC (2016): "State assembly elections: nudging the voter in one direction," *The Hindu*, op-Ed article.

Jens, C. E. (2017a): "Political uncertainty and investment: Causal evidence from US gubernatorial elections," *Journal of Financial Economics*, 124, 563–579.

——— (2017b): "Political uncertainty and investment: Causal evidence from US gubernatorial elections," *Journal of financial economics*, 124, 563–579.

Julio, B. and Y. Yook (2012): "Political uncertainty and corporate investment cycles," *The Journal of Finance*, 67, 45–83.

Kapur, D. and M. Vaishnav (2013): "Quid Pro Quo: Builders, Politicians, and Election Finance in India," Working Papers 276, Center for Global Development.

Kaushik, A. K. and Y. Goyal (2019): "The desirability of one nation one election in India: Simultaneous elections," *The Journal of Social, Political, and Economic Studies*, 44, 110–120.

Knight, B. and N. Schiff (2010): "Momentum and social learning in presidential primaries," *Journal of Political Economy*, 118, 1110–1150.

Kogan, V., S. Lavertu, and Z. Peskowitz (2018): "Election timing, electorate composition, and policy outcomes: Evidence from school districts," *American Journal of Political Science*, 62, 637–651.

Kumar, A. (2023, October 13): "'One Nation, One Election' Will Further Weaken Indian Democracy," *The Wire*.

Lee, D. S. (2008): "Randomized experiments from non-random selection in US House elections," *Journal of Econometrics*, 142, 675–697.

Lizzeri, A. and N. Persico (2001): "The provision of public goods under alternative electoral incentives," *American Economic Review*, 91, 225–239.

MacRae, C. D. (1977): "A political model of the business cycle," *Journal of political economy*, 85, 239–263.

Ministry of Law and Justice (2019): "Expenditure on conducting general election (Unstarred Question No. 1508)," Rajya Sabha, unstarred Question No. 1508.

Mitra, A. and S. Mitra (2017): "Electoral uncertainty, income inequality and the middle class," *The Economic Journal*, 127, 1119–1152.

Nguyen, D. D. and V. Sila (2024): "Corporate Hiring under Uncertainty," *Registered Proposal for Review of Corporate Finance Studies*.

Nordhaus, W. D. (1975): "The Political Business Cycle," *The Review of Economic Studies*, 42, 169–190.

Pagano, M. and P. F. Volpin (2005): "The political economy of corporate governance," *American Economic Review*, 95, 1005–1030.

Papaioannou, E. and G. Siourounis (2008): "Democratisation and growth," *The Economic Journal*, 118, 1520–1551.

Persson, T. and G. Tabellini (2005): *The economic effects of constitutions*, MIT Press.

——— (2009): "Democratic capital: The nexus of political and economic change," *American Economic Journal: Macroeconomics*, 1, 88–126.

Rao, D. N. B. (2023, September 13): "If Elections at all levels in India are held in 2024, it will cost Ten Lakh Crores!" *Primepost*.

Redl, C. (2020): "Uncertainty matters: Evidence from close elections," *Journal of International Economics*, 124, 103296.

Rickard, S. J. (2012): "Electoral systems, voters' interests and geographic dispersion," *British Journal of Political Science*, 42, 855–877.

Rigobon, R. and D. Rodrik (2005): "Rule of law, democracy, openness, and income: Estimating the interrelationships1," *Economics of transition*, 13, 533–564.

Rogowski, R. (1987): "Trade and the variety of democratic institutions," *International Organization*, 41, 203–223.

Sakurai, S. N. and N. A. Menezes-Filho (2008): "Fiscal policy and reelection in Brazilian municipalities," *Public Choice*, 137, 301–314.

Sapir, A. and K. Sekkat (1999): "Optimum electoral areas: Should Europe adopt a single election day?" *European Economic Review*, 43, 1595–1619.

Sarkar, S. (2019): "Votes and policies: Evidence from close elections in India," Unpublished thesis. Mimeo, MIT.

Snowberg, E., J. Wolfers, and E. Zitzewitz (2007): "Partisan impacts on the economy: evidence from prediction markets and close elections," *The Quarterly Journal of Economics*, 122, 807–829.

Sun, L. and S. Abraham (2021): "Estimating dynamic treatment effects in event studies with heterogeneous treatment effects," *Journal of econometrics*, 225, 175–199.

Tabellini, M. and G. Magistretti (2025): "Economic integration and the transmission of democracy," *Review of Economic Studies*, 92, 2765–2792.

The Economist (2024): "Why India's election is the most expensive in the world," *The Economist*.

The Times of India (2015): "Bihar polls cost state exchequer Rs 300 crore," *The Times of India*.

——— (2025): "'One nation, one election can boost GDP by 1.5%, save Rs 12,000 crore': Nirmala Sitharaman," *The Times of India*.

Trebbi, F., P. Aghion, and A. Alesina (2005): *Choosing electoral rules: theory and evidence from US cities*, National Bureau of Economic Research.

Vaishnav, M., C. Mallory, and A. Richter (2025): "Does "One Nation, One Election" Make Sense for India?" .

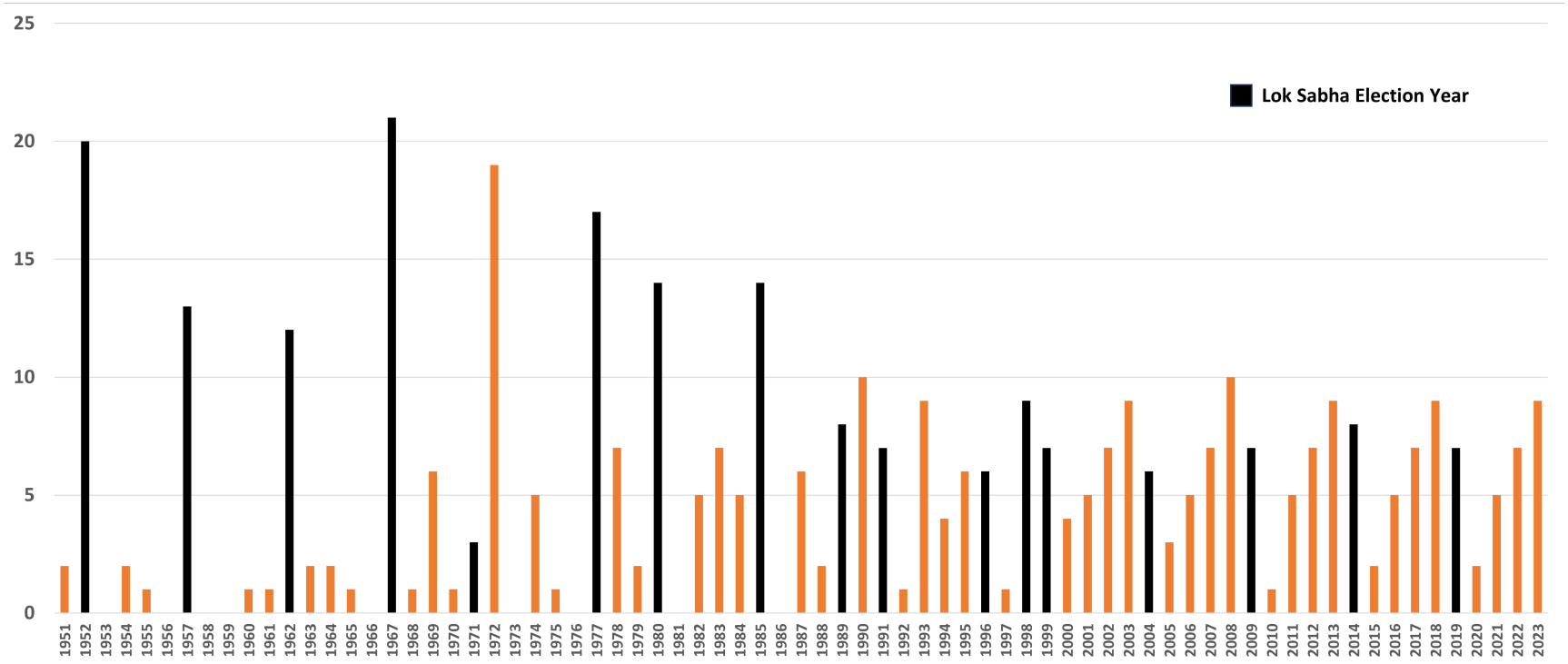
Vogl, T. S. (2014): "Race and the Politics of Close Elections," *Journal of Public Economics*, 109, 101–113.

Wani, A. A. and R. A. Dar (2024): "Simultaneous Elections in Plural Societies," *Economic and Political Weekly*, January 6, 2024, Vol LIX, No. 1.

Wooldridge, J. M. (2021): "Two-way fixed effects, the two-way mundlak regression, and difference-in-differences estimators," *Available at SSRN 3906345*.

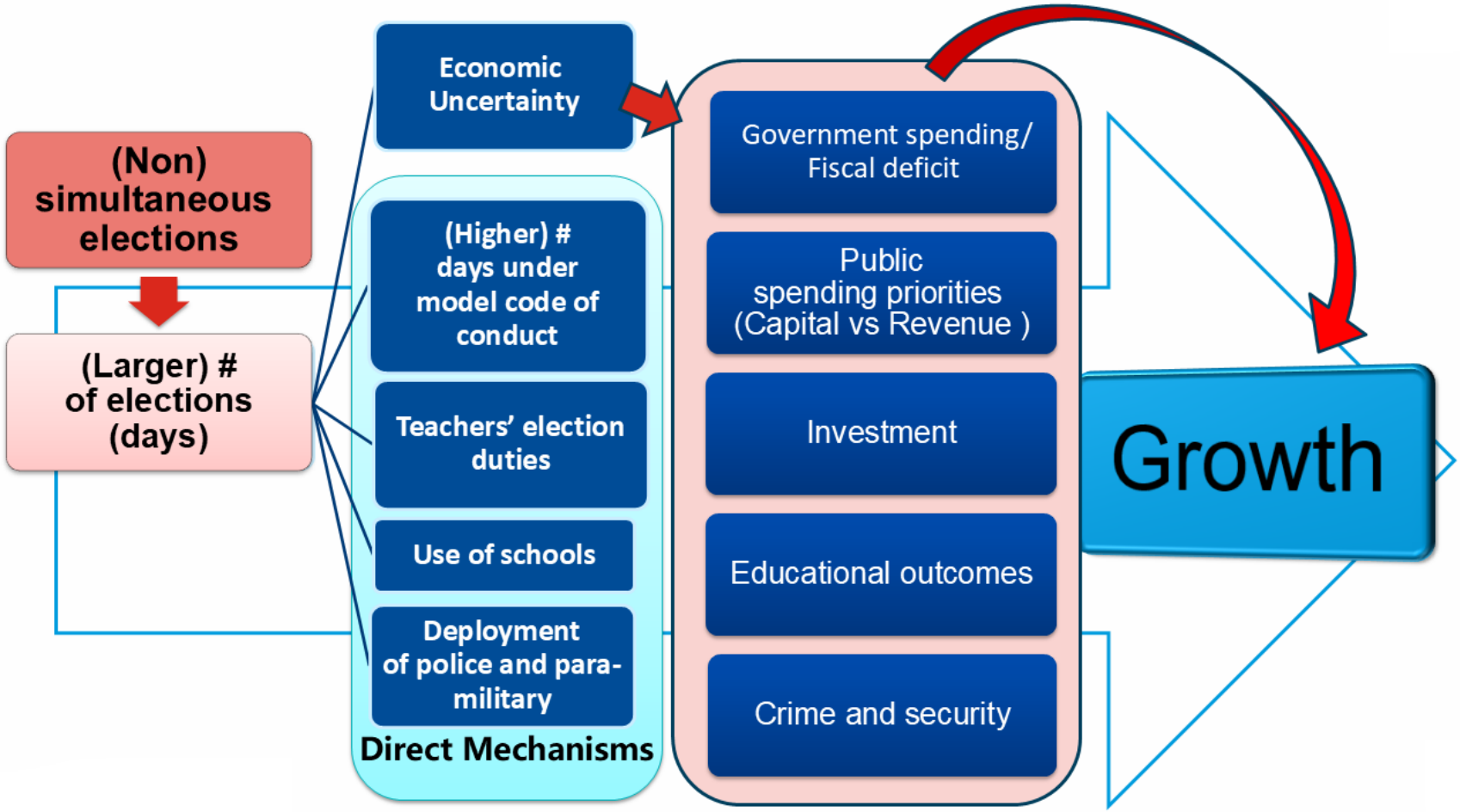
——— (2023): "Simple approaches to nonlinear difference-in-differences with panel data," *The Econometrics Journal*, 26, C31–C66.

Figure 1: Number of state assembly elections



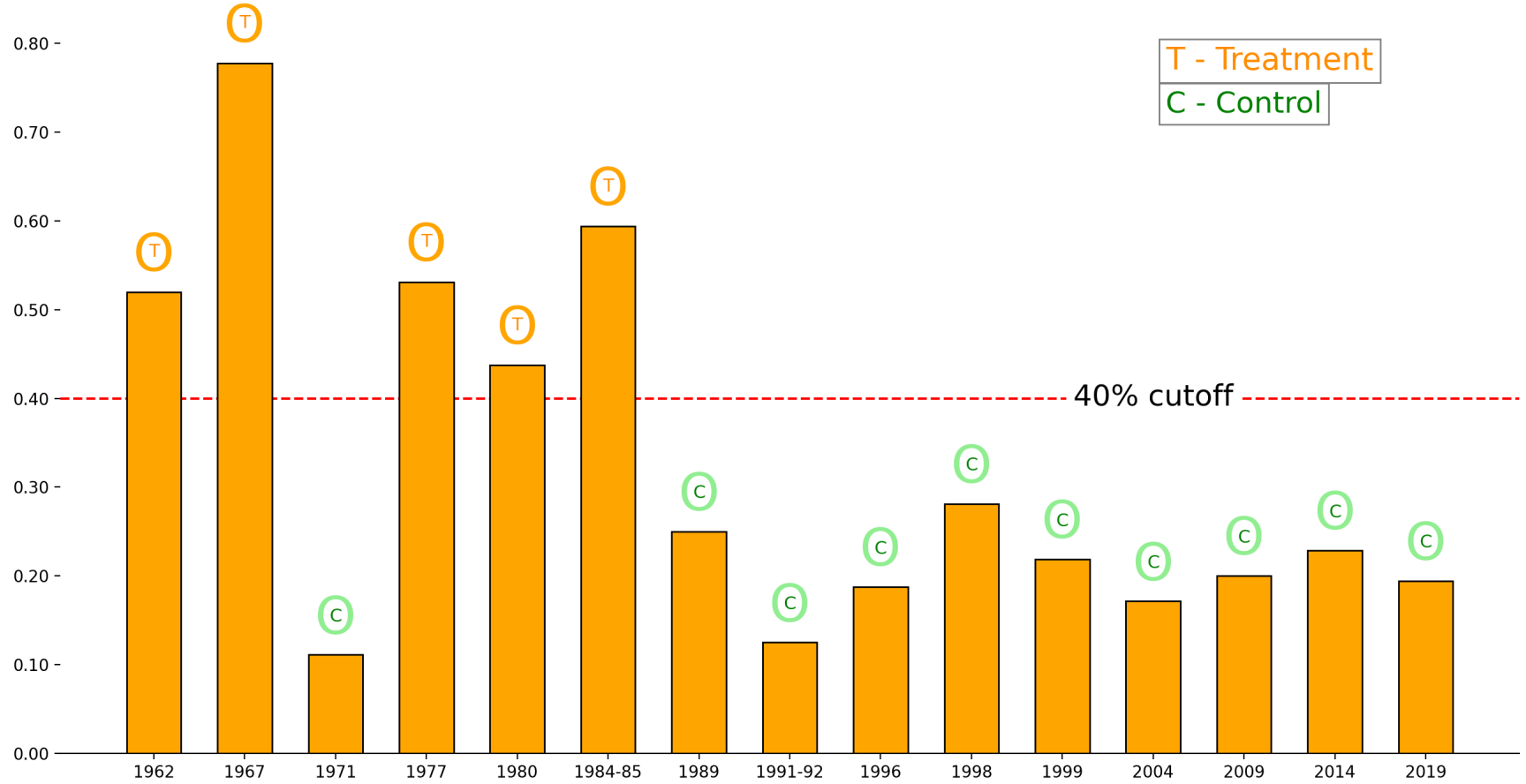
Notes: The chart shows the number of Vidhan Sabha Elections held in one calendar year. Andaman & Nicobar Island is excluded due to lack of data. Source: Election Commission of India

Figure 2: Economic mechanisms: (Non) Simultaneous elections



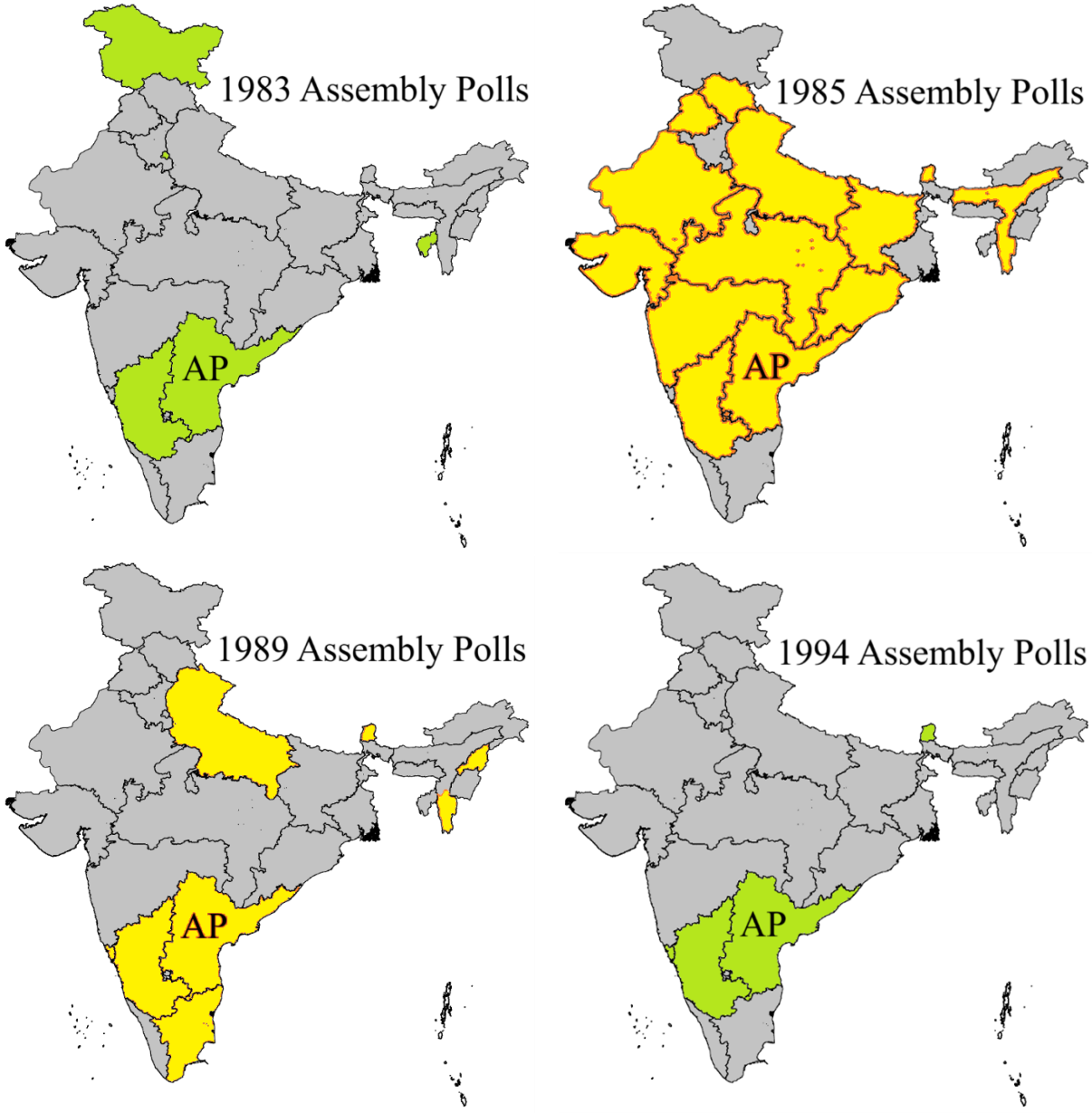
Notes. This figure shows both direct and indirect pathways through which the conduct of elections impact national and state growth. We emphasize how greater number of days lost to elections may affect growth through direct mechanisms and increasing economic uncertainty, which in turn affect intermediate mechanisms such as fiscal deficits, fiscal spending priorities and investment outcomes. These potential mechanisms may explain how moving to a system of simultaneous elections may impact growth.

Figure 3: Simultaneous elections as treatment



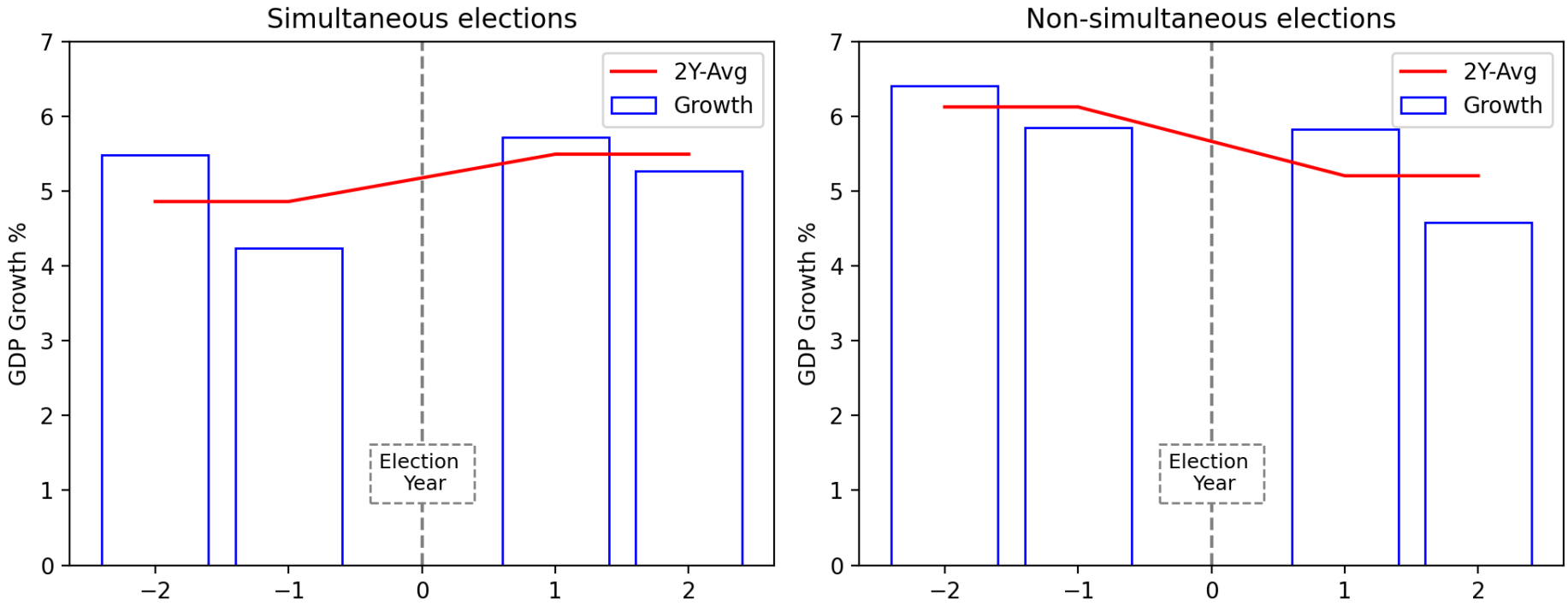
Notes. This figure shows the treatment group and control group: treatment, if the proportion of states having an Assembly election (in the year of the general election) to the total states present is greater than 40 percent and control, if less than 40 percent. In the sample period of 1961 to 2023, five years are in the treatment group which we will call national simultaneous elections: 1962, 1967, 1971, 1977 and 1984. The 1984 Lok Sabha election cycle was split between 1984 and 1985, hence we label it as 1984-85. We have 5 election cycles in the treatment group and 10 election cycles in the control group. Source. Election Commission of India.

Figure 4: Andhra Pradesh - 1983, 1985, 1989, 1994 assembly polls



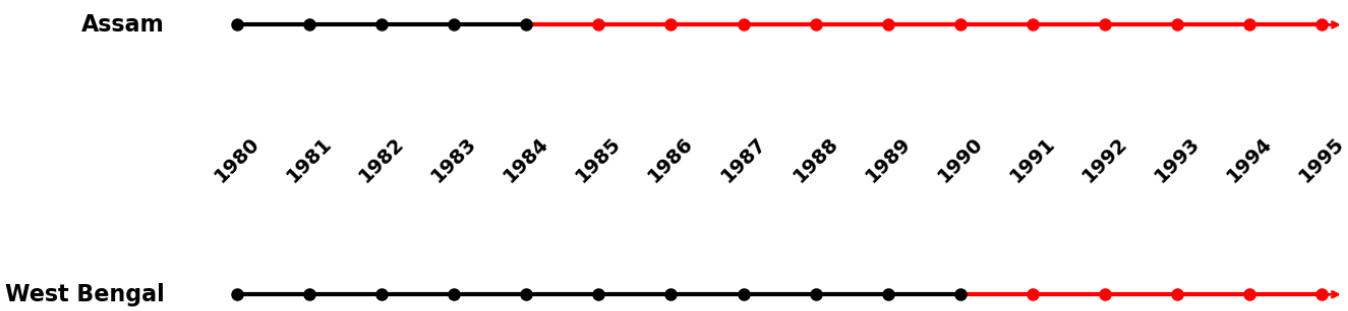
Notes. In this figure, Andhra Pradesh is used as an example to illustrate what "simultaneous" election means for a given state. Its four assembly elections spanning from 1983 to 1994 are shown along with all the other (shaded) states that had assembly elections in the same year. Only two of the four elections shown here (in orange) happened along with the General elections, 1985 and 1989, respectively.

Figure 5: National growth rate: Simultaneous and non-simultaneous elections



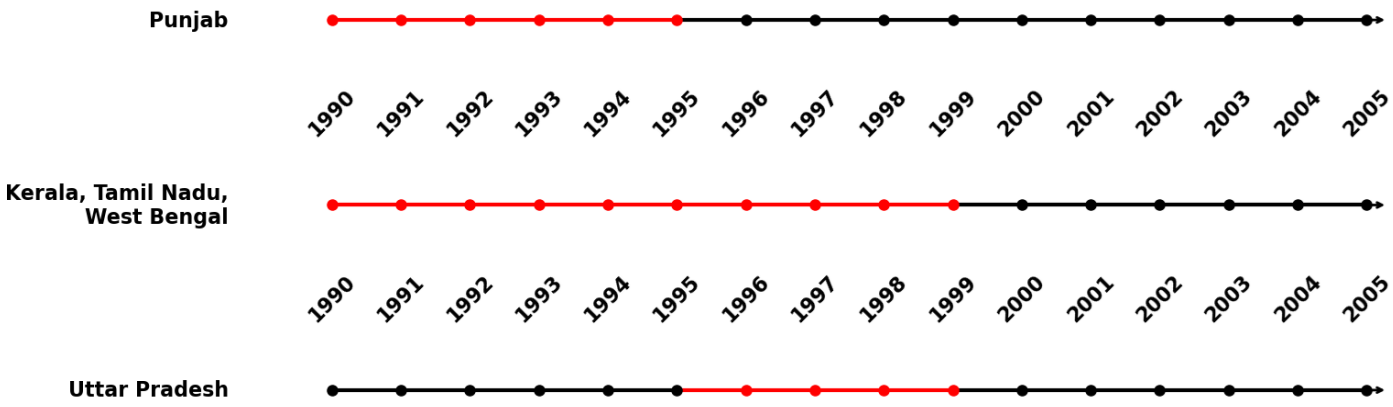
Notes. This chart depicts the evolution of real GDP growth rate at the national level for simultaneous and non-simultaneous election cycles. The sample period is 1961 to 2023. Source: RBI DBIE Table 222: Select Macro-Economic Aggregates - Growth and Investment Rates (At Constant Prices).

Figure 6: States that experienced Staggered Treatment Timing



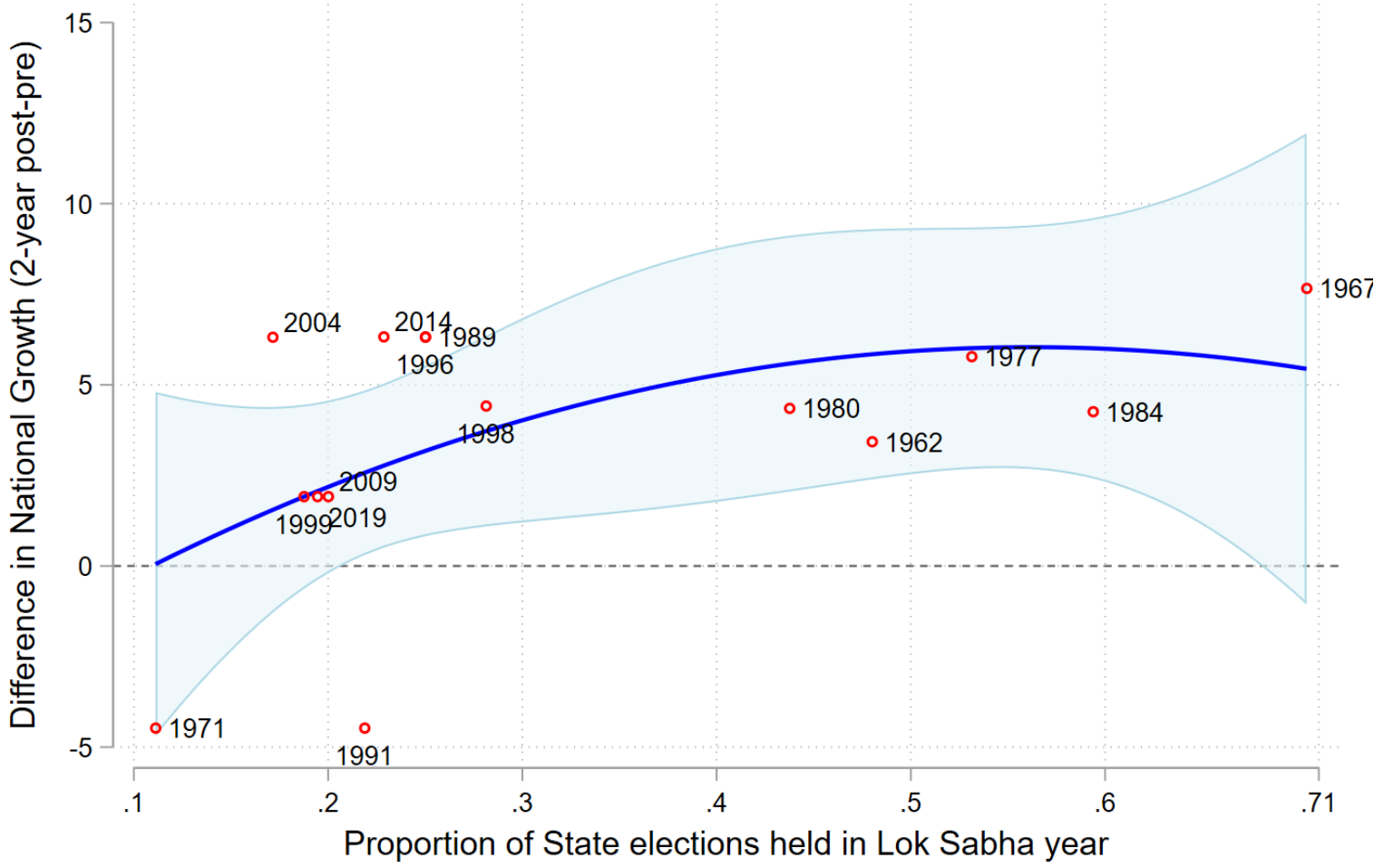
Notes. This figure plots two states that experienced simultaneous elections but at different timings. This leads us to have a staggered treatment setup which the Two Way Fixed Effects (TWFE) estimator is not suited for estimation.

Figure 7: States that switched in and out of Simultaneous Elections



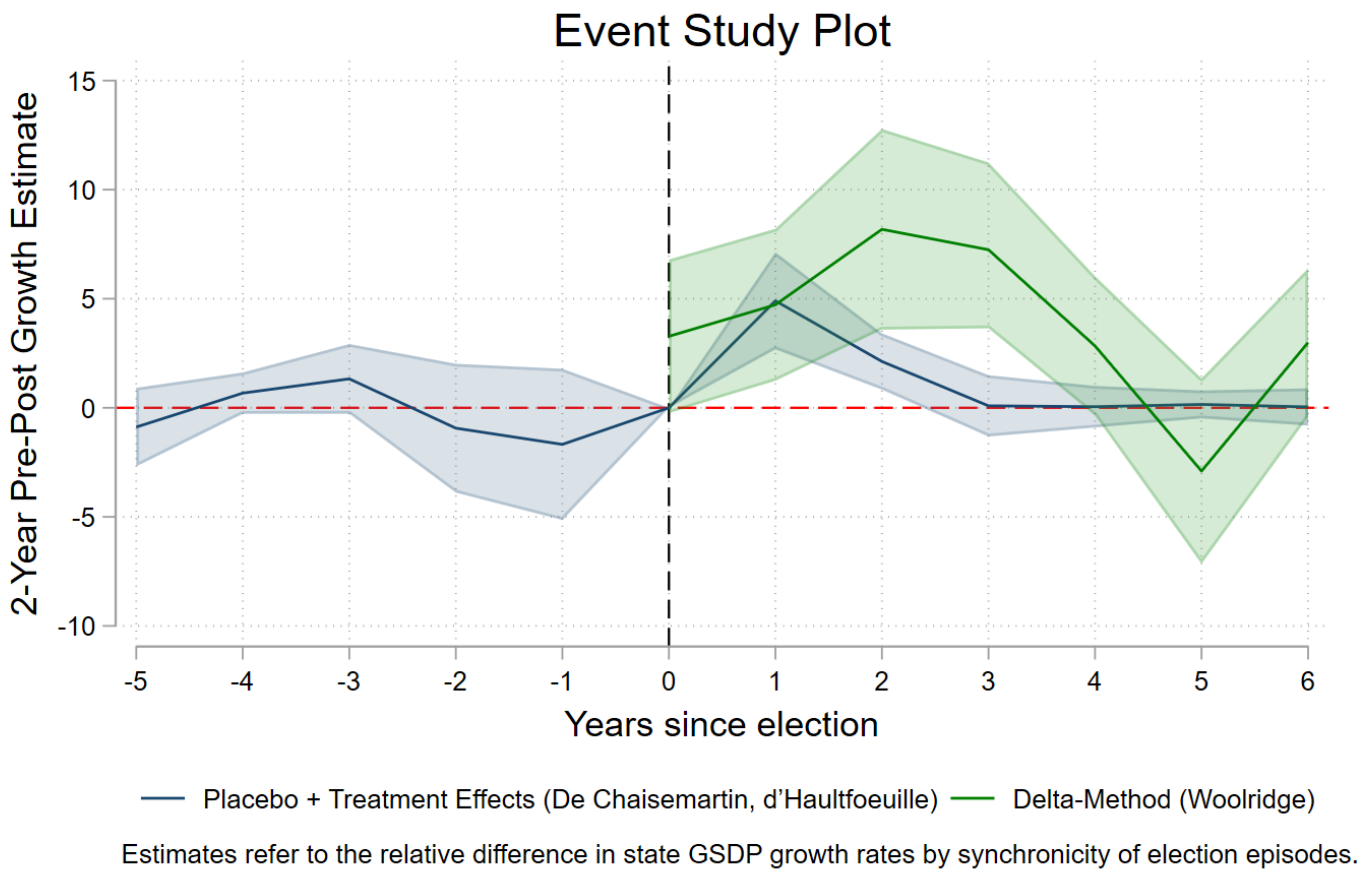
Notes. This figure shows the experience of states that experienced a move toward simultaneous elections but moved out of the treatment at a later point in time. Switchers-in and switchers-out confound the effects that we want to estimate which makes Two Way Fixed Effects (TWFE) infeasible for estimation.

Figure 8: National growth rate with synchronous elections as a continuous treatment



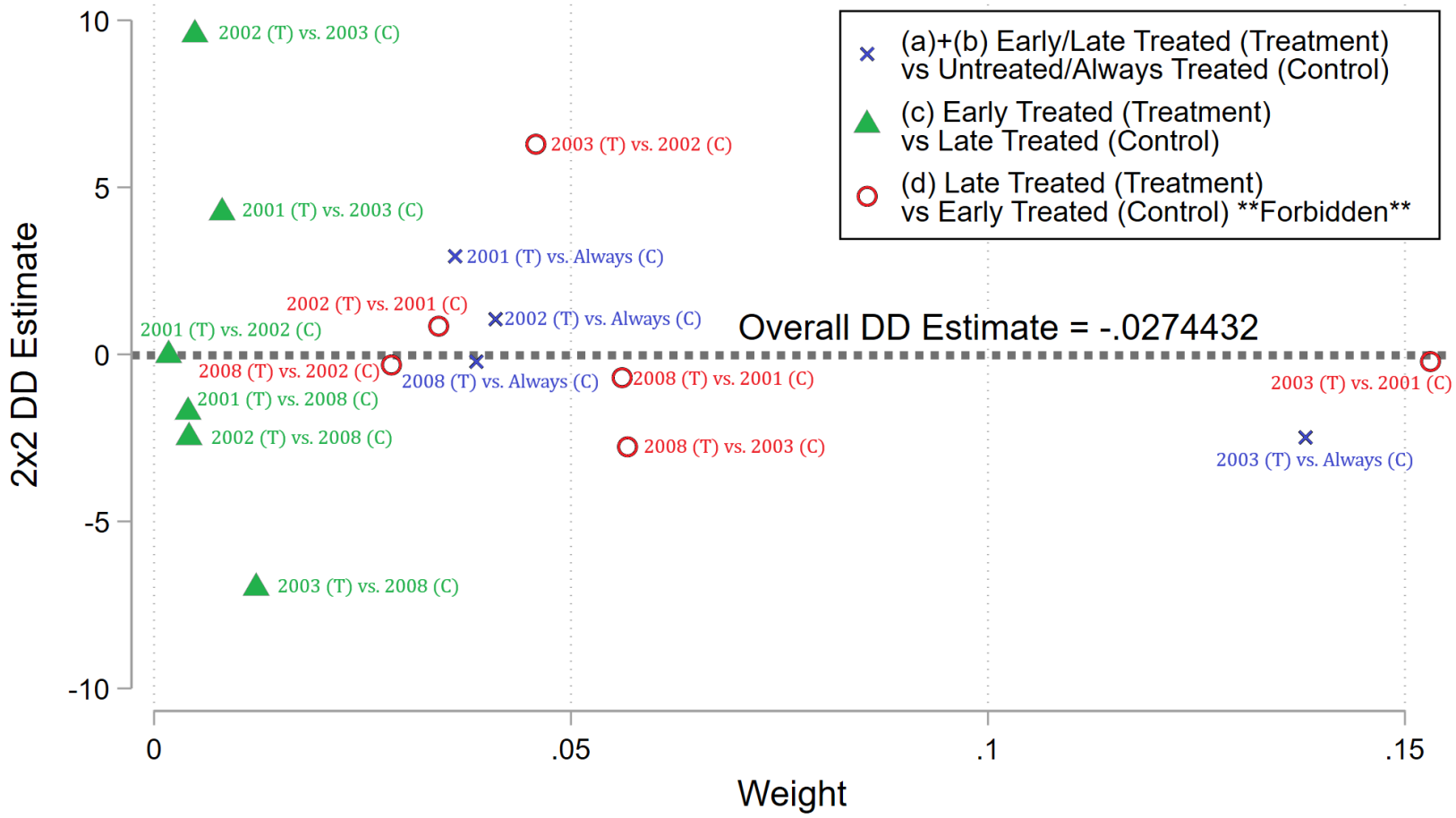
Notes. This figure plots the average treatment effect of experiencing a given number of state assembly elections simultaneously for each group of Lok Sabha elections grouped by the count of simultaneous elections on the national GDP growth rate. The sample period is 1961 to 2023. Source: RBI DBIE Table 222: Select Macro-Economic Aggregates - Growth and Investment Rates (At Constant Prices).

Figure 9: Event Study plot for States' 2-year Growth rate differences with switchers



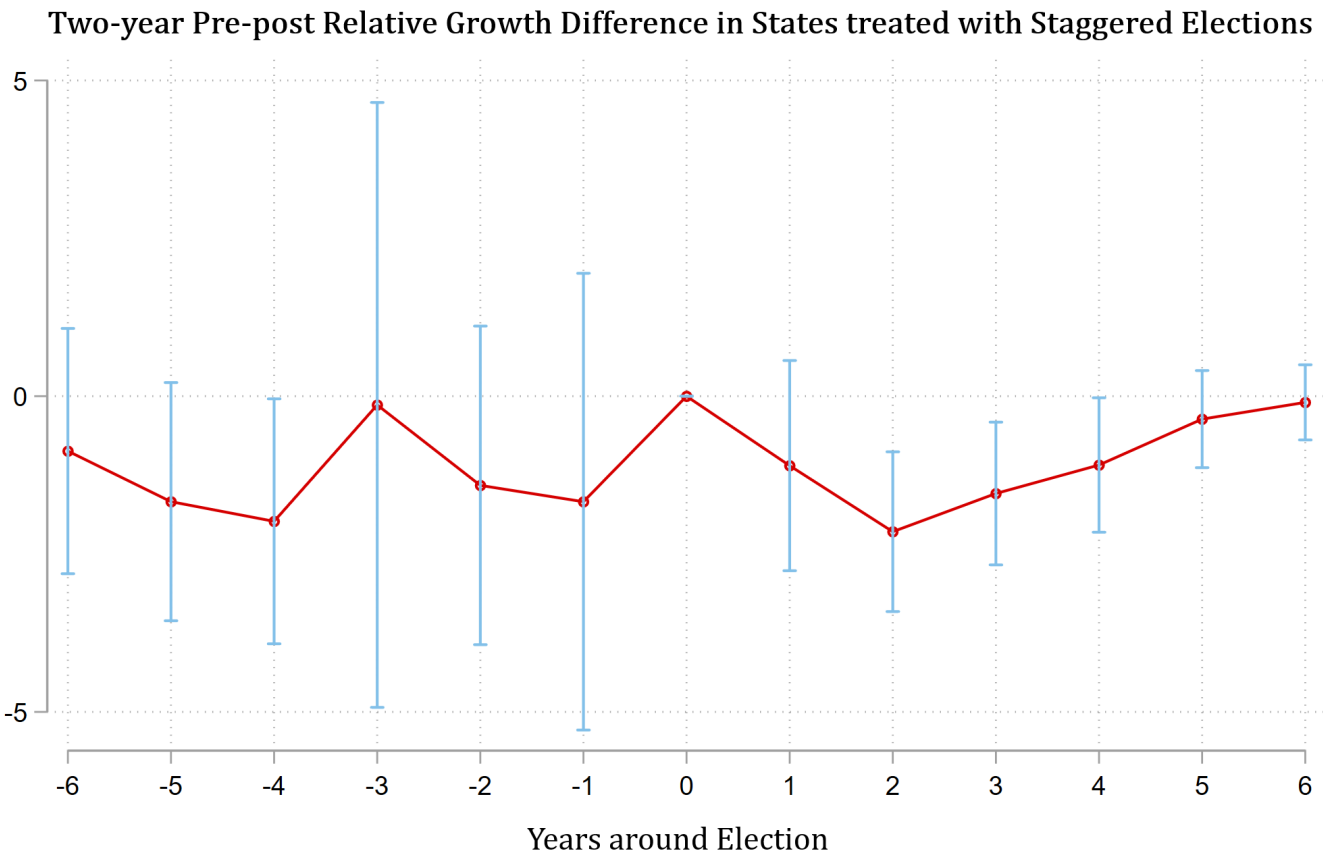
Notes. This figure plots the average treatment effect of experiencing a simultaneous election at the state assembly elections level following De Chaisemartin and d'Haultfoeuille (2024) and Wooldridge (2023). We find significant effects on real GSDP growth for states experiencing simultaneous elections in the years immediately after the elections relative to those states that had non-simultaneous elections. Both event study plots show positive and significant effects immediately after the election, with higher growth of 4.7 to 4.9 p.p. in the year after elections, the effects of which subside after 3-4 years.

Figure 10: Bacon Decomposition of TWFE - Impact of Non-Simultaneous Elections



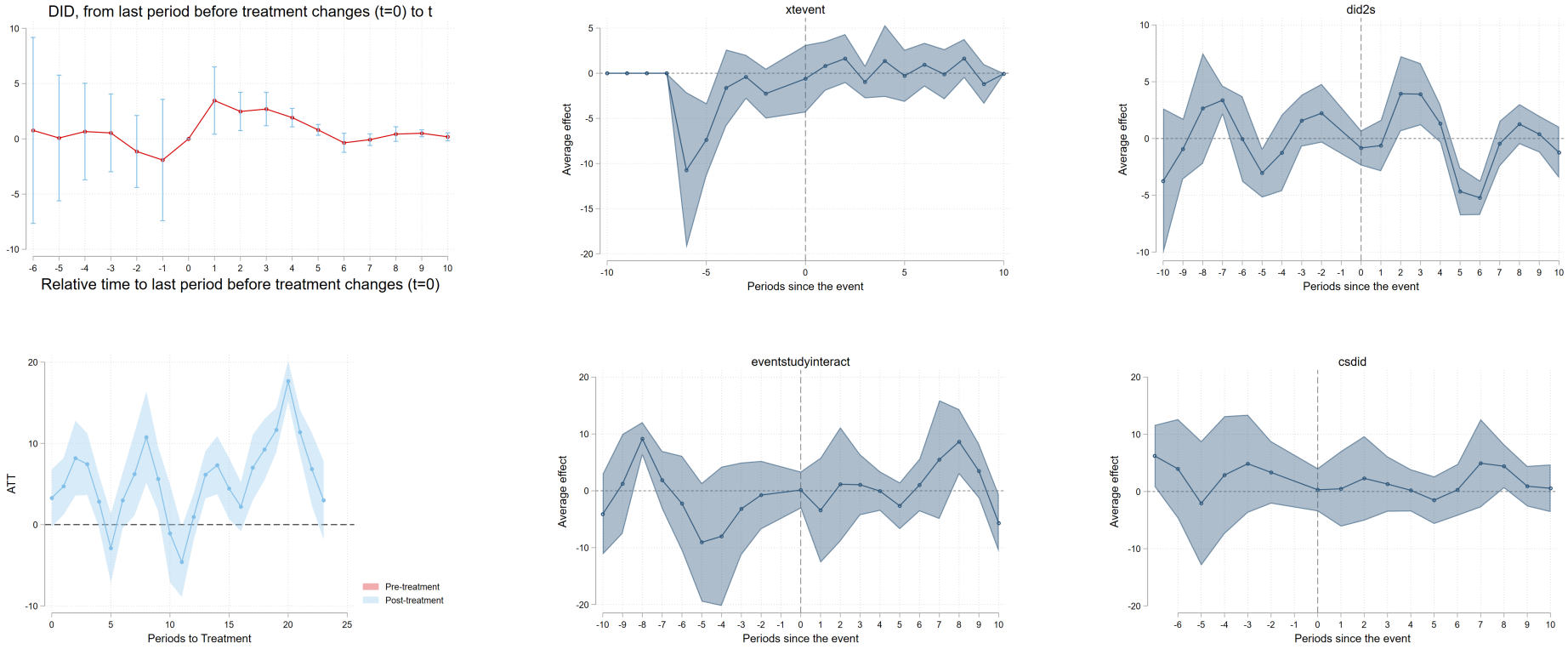
Notes. This figure plots disaggregated effects estimated referred to as the Bacon decomposition for the Post-1999 Truncated State-Year panel. This provides the constituent weights and estimates behind the Two Way Fixed Effect (TWFE). It helps us see whether there are any negative weights biasing the TWFE results.

Figure 11: Impact of Non-Simultaneous Elections on GSDP Growth after 1999



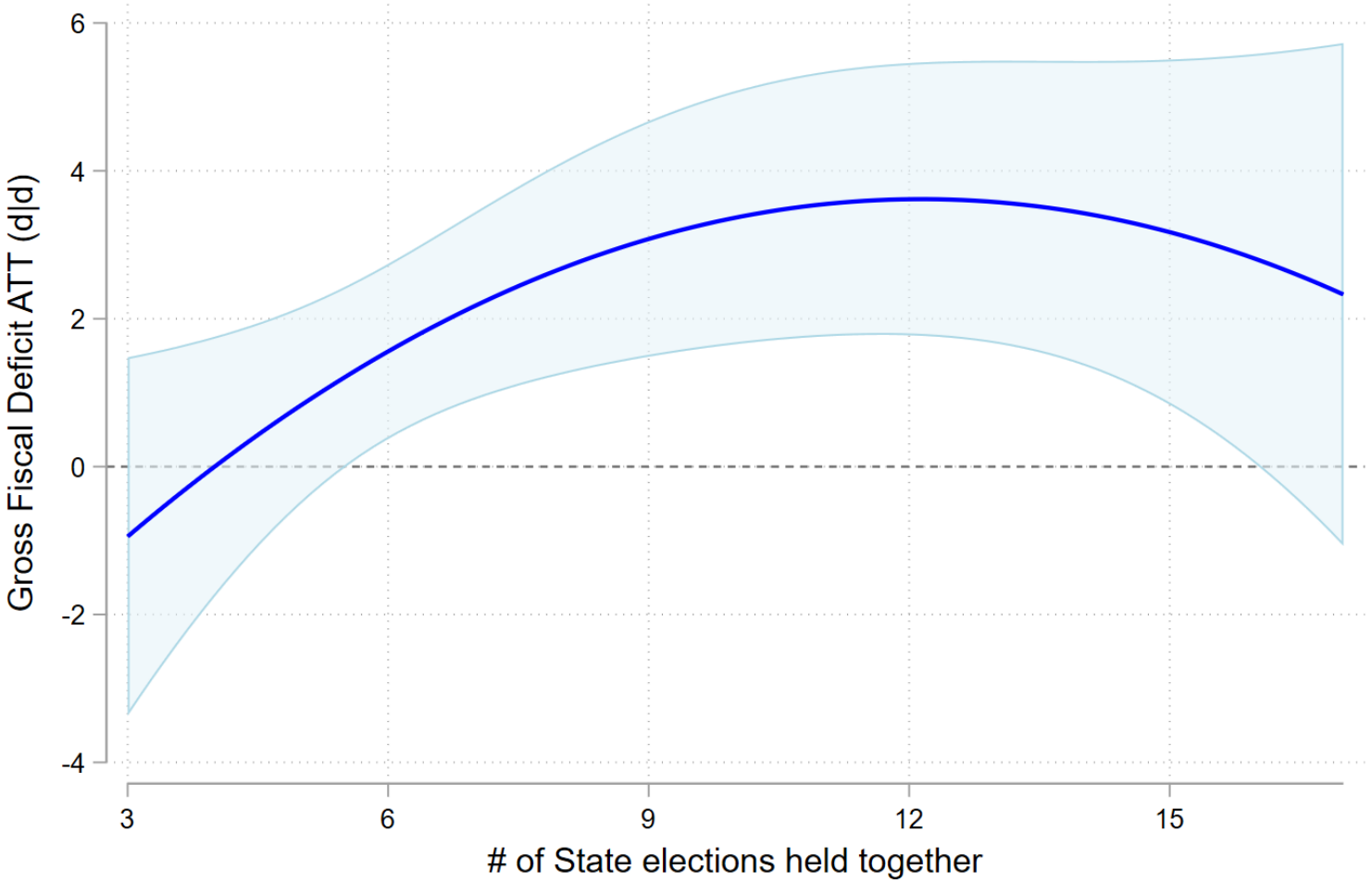
Notes.This figure plots the average treatment effect of moving to non-simultaneous elections on Indian states after 1999. Our method of estimation follows De Chaisemartin and d'Haultfoeuille (2024) and we find significant negative effects on real GSDP growth for states shifting to staggered elections in the years immediately after the elections relative to those states that had non-simultaneous elections. The negative and significant effects occur after the election, owing to greater disruptions due to a misaligned election cycle; the effects again which subside after 4-5 years.

Figure 12: Event Study Plots for State-level GDP Growth differences



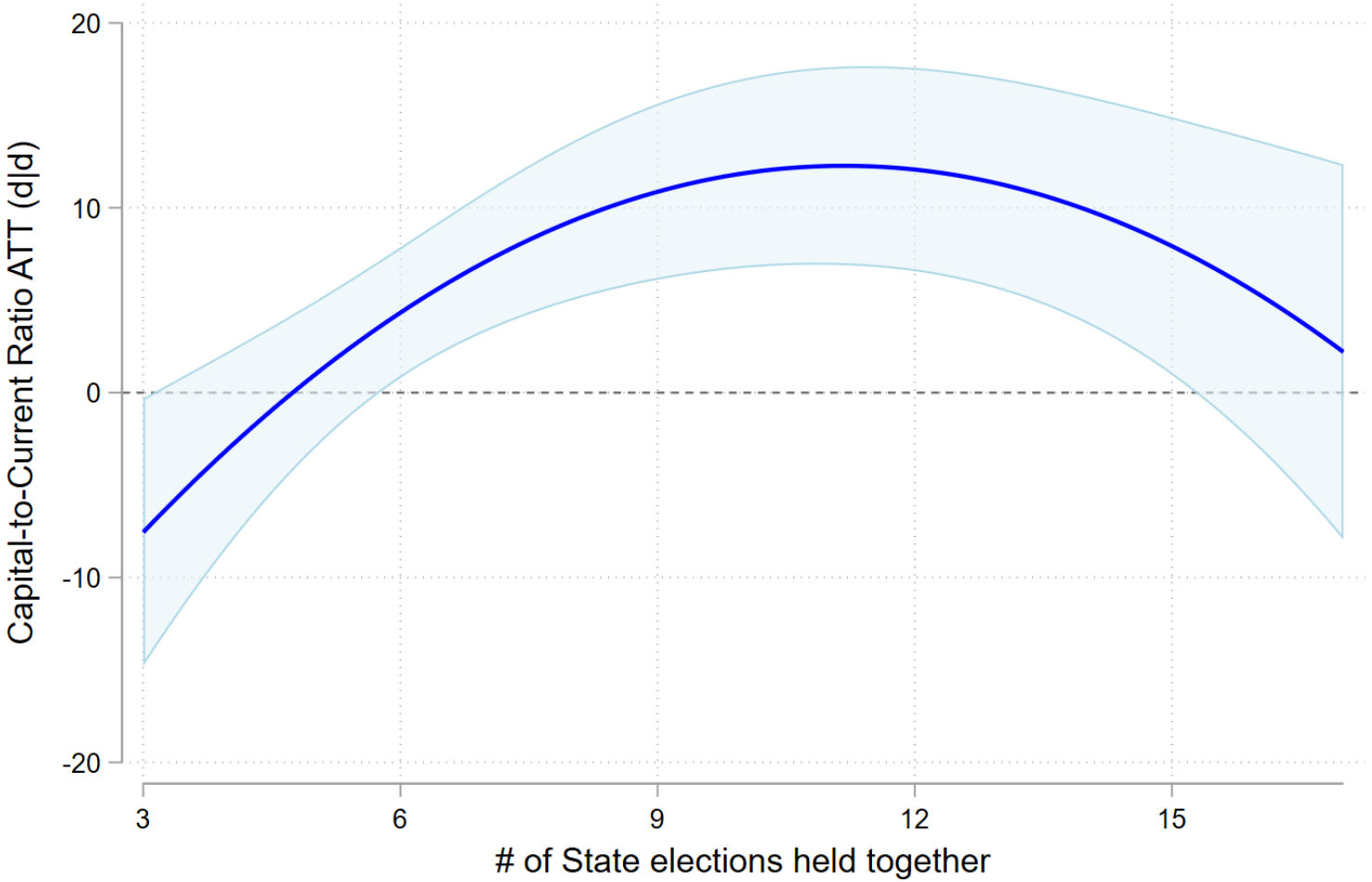
Notes. In clockwise manner, the estimation models used are following Chaisemartin and D'Haultfœuille 2024 , Freyaldenhoven, Hansen, Shapiro (2019), Gardner 2021, Callaway and Sant'Anna 2021, Sun and Abraham (2020), Wooldridge 2021 and Wooldridge 2023.

Figure 13: Fiscal deficit with synchronous elections as a continuous treatment



Notes. This figure plots the average treatment effect of experiencing a given number of state assembly elections simultaneously for each group of Lok Sabha elections grouped by the count of simultaneous elections on the Centre's Gross Fiscal Deficit. The sample period is 1971 to 2023. (Source: RBI DBIE Table 232: Select Fiscal Indicators of the Central Government (as percentage of GDP)).

Figure 14: Capital-to-current expenditure ratio with synchronous elections as a continuous treatment



Notes. This figure plots the average treatment effect of experiencing a given number of state assembly elections simultaneously for each group of Lok Sabha elections grouped by the count of simultaneous elections on the capital-to-current ratio. The sample period is 1991 to 2023. Source- Handbook of Statistics on Indian Economy: Table 95: Major Heads of Expenditure of the Central Government.

Table 1: Rising asynchronicity in Indian elections

Panel A: Decade-wise frequency of simultaneous elections

Decade	Simultaneous elections	Non-simultaneous elections	Total
1951-1960	35	4	39
1961-1970	33	14	47
1971-1980	34	34	68
1981-1990	27	30	57
1991-2000	30	24	54
2001-2010	13	47	60
2011-2020	15	46	61
2021-2024	8	21	29
Total	195	220	415

Panel B: LS election episodes with number of VS elections held simultaneously

LS election Year	Simultaneous elections	NS elections before next LS	Notes
1951-52	22	3	First elections held in 68 phases
1957	13	2	
1962	12	5	
1967	21	8	
1971	3	25	Fourth Lok Sabha prematurely dissolved
1977	17	9	Sixth Lok Sabha elected in the Emergency
1980	14	12	Coalition (Janata Party alliance) collapsed
1984-85	19	8	Voting delayed to 1985 due to insurgency
1989	8	10	
1991-92	8	19	Former PM Rajiv Gandhi assassinated
1996	6	1	
1998	9		Coalition (United Front) govt. collapsed
1999	7	25	Coalition (NDA) government collapsed
2004	6	25	
2009	7	22	
2014	8	23	
2019	7	23	
2024	8		
Total	195	220	

Notes. NS: Non-simultaneous, LS: Lok Sabha (Parliament or House of the People), VS: Vidhan Sabha (State legislative assembly). This table lists the number of simultaneous elections and non-simultaneous elections held in each decade (Panel A) and the number of simultaneous election episodes in each Lok Sabha election conducted (Panel B), since the Indian Constitution came into force in 1950. We define a simultaneous election episode to occur when a Vidhan Sabha election that is held in the same calendar year as the Lok Sabha elections. Non-simultaneous elections are defined analogously, such an episode is said to occur when a Vidhan Sabha election is held in a calendar year that does not feature a Lok Sabha election. We count the number of Vidhan Sabha elections held between the completion of one Lok Sabha election and the beginning of another, as the non-simultaneous elections before the next Lok Sabha elections. The total number of elections in both panels are equal, given that they will sum to the same number totals of simultaneous and non-simultaneous Vidhan Sabha elections. The table has been constructed based on election data from the ECI.

Table 2: Difference-in-difference with continuous treatment

VARIABLES	(1) Average effect 2yr Growth rate
Number of States = 3	-4.468***
	(0.0606)
Number of States = 5	4.265***
	(0.0606)
Number of States = 6	6.320**
	(2.153)
Number of States = 7	1.921
	(4.214)
Number of States = 8	6.330***
	(0.606)
Number of States = 9	4.422***
	(0.0606)
Number of States = 13	3.435***
	(0.0606)
Number of States = 15	4.356***
	(0.0606)
Number of States = 18	5.784***
	(0.0606)
Number of States = 21	7.667***
	(0.0606)
Lok Sabha Election Cycles	15
R-squared	0.583

Notes. This table reports results from estimating Equation (3) in the text. This table looks at the number of Vidhan Sabha elections held simultaneously with Lok Sabha elections as a multi-valued discrete treatment on India. We group Lok Sabha elections by the count of Vidhan Sabha elections held together. The coefficients produced in column (1) are the respective average treatment effects on the treated unit for each group of Lok Sabha elections, grouped by the count of simultaneous elections at the state level. The regression covers fifteen election cycles dating back to 1962. The dependent variable is the two-year pre-post difference in the real national GDP growth rate. The data on real GDP for India used here spans from 1960 to 2023. Standard errors are clustered at the state-level and reported in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels.

Table 3: Summary of State GSDP Growth results (1-Year and 2-Year Pre-Post DiD)

	TWFE (1)	De Chaisemartin (2023) (2)	Woolridge (2023) (3)
2-Year Pre-Post	−0.087	4.904***	4.724***
	(0.271)	(1.132)	(1.776)
1-Year Pre-Post	−0.222	7.822**	5.082***
	(0.349)	(3.735)	(1.861)

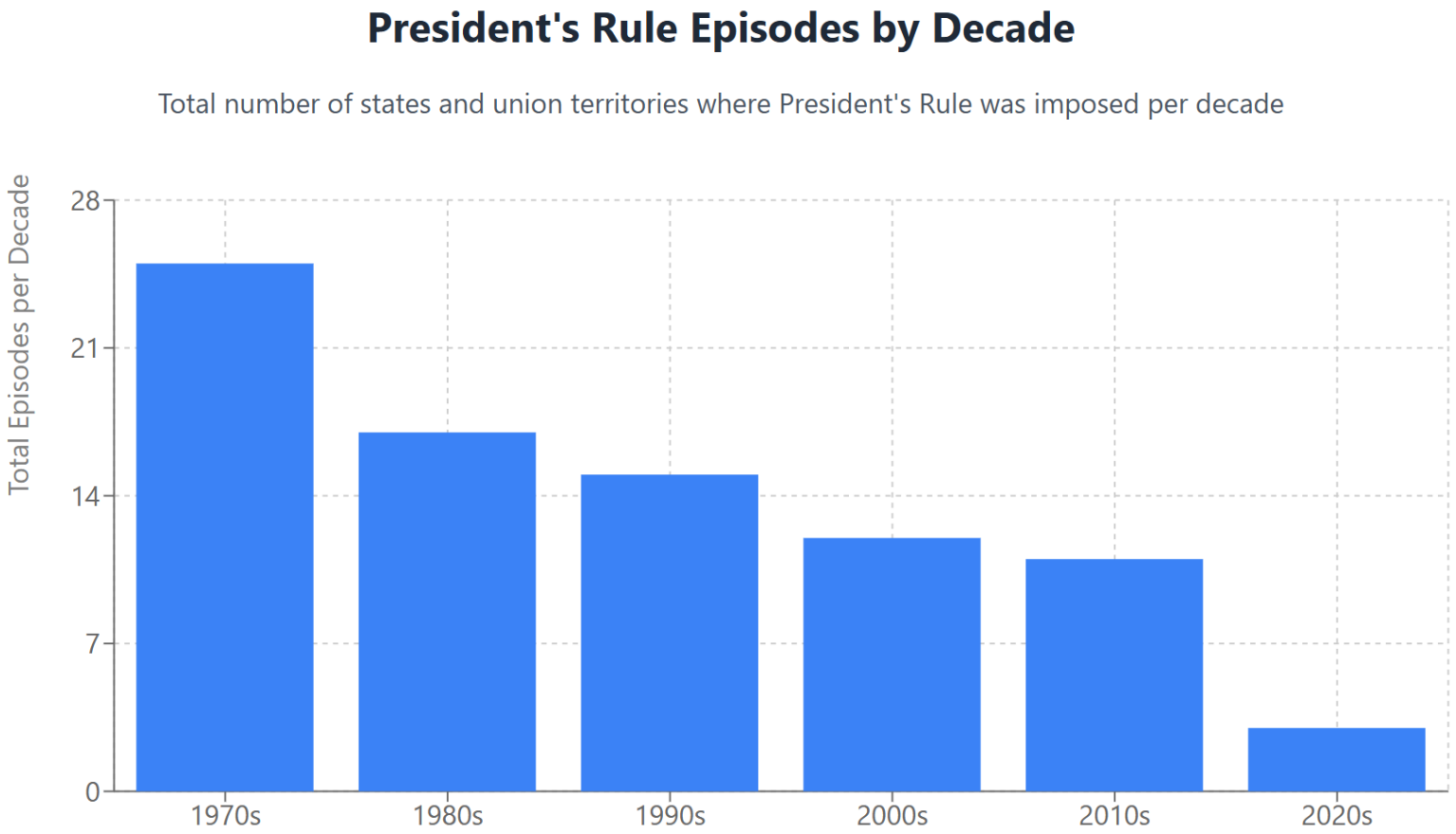
Notes. The sample period for the state×year panel spans from 1982 to 2023. Dummy variable on the left column is an indicator variable for simultaneous election treatment. This table reports estimates of the difference in the post-pre differences of dependent variables between simultaneous and non-simultaneous elections. The post-pre differences are calculated at a 2 year interval, before and after an election, and the TWFE results are printed in column (1). The TWFE are biased due to heterogenous effects, staggered treatment timing and switching in and out of treatment. We use DID methods that are robust to these issues. Column (2) reports robust estimates using de Chaisemartin and D'Haultfœuille (2023) while column (3) reports robust estimates using Woolridge (2023). All reported values in columns (1), (2) and (3) for nominal GSDP growth are given in percentage points of GSDP.

Table 4: Regression Results by Share of ACs in State with 5 percent Margin

Share of ACs in State 5% Margin	Number of Assembly Elections	Proportion of Sample	2-Year Pre-Post Growth Difference: 1st Year After Elections	2nd Year After Elections
10	127	57%	4.51***	1.63**
			(1.07)	(0.68)
20	106	48%	4.49***	1.63**
			(1.05)	(0.68)
30	84	38%	3.09***	2.01***
			(0.75)	(0.77)
40	55	25%	2.033	0.90
			(1.43)	(0.93)
50	33	15%	1.17	0.29
			(0.92)	(0.62)

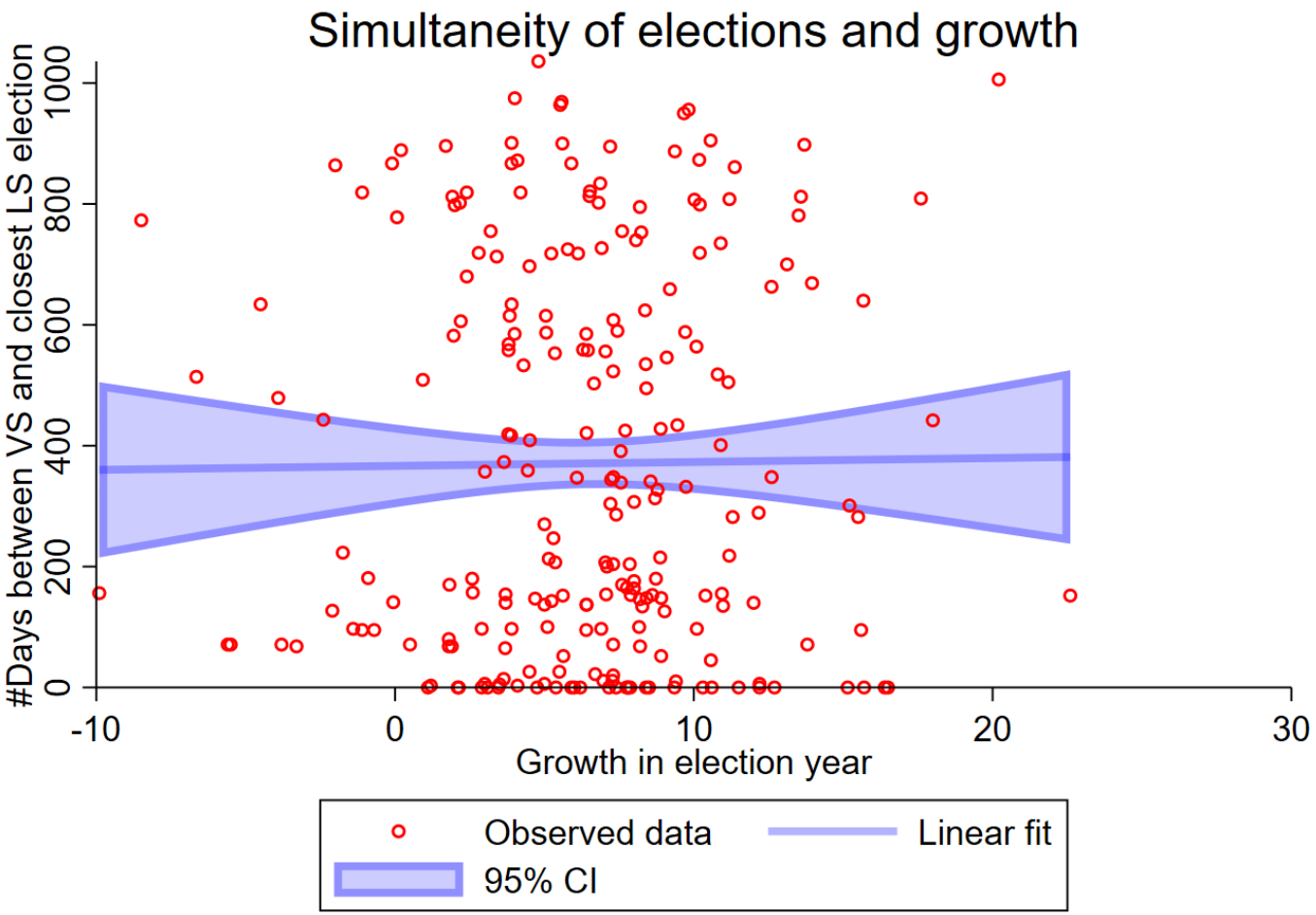
Notes: Standard errors are clustered at the state-level and report in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels.

Figure A1: Total number of state assembly dissolutions under Article 356 in each decade



Notes. This figure plots the total number of episodes in each decade, wherein President's rule was declared by the Central government dissolving the state assembly. This figure has reduced significantly in recent decades.

Figure A2: State GSDP growth in the year of election for simultaneous and staggered elections



Notes. This figure plots on the horizontal axis the GSDP growth rate of states in the year that they have conducted a state assembly election. The vertical axis plots the number of days between the state election and the national election, with a zero day gap indicating that the state experienced a 'simultaneous' election. We find no significant relation between the decision to hold elections simultaneous elections based upon the economic performance of a state.

Table A1: Descriptive Statistics for National and State Panels

Panel A: National Elections				
	Real GDP	Central FD	Capital to Current	GFCF
Mean	4.988	5.143	37.478	23.849
SE(Mean)	0.368	0.209	3.174	0.778
Median	5.515	5.080	29.814	24.484
SD	3.119	1.519	22.886	6.216
Observations	72	53	52	64
Panel B: State Elections - Full Sample				
	Real Growth Rate	1-Year Growth Diff.	2-Year Growth Diff.	1981 Real PC GSDP
Mean	6.516	0.059	-0.161	3,881
SE(Mean)	0.175	0.237	0.165	123
Median	6.500	0.011	-0.050	3115
SD	5.854	7.774	5.295	4,122
Observations	1,118	1,077	1,029	1,118
Panel C: State Simultaneous Elections				
	Real Growth Rate	1-Year Growth Diff.	2-Year Growth Diff.	1981 Real PC GSDP
Mean	6.669	0.150	-0.094	4,387
SE(Mean)	0.325	0.443	0.314	230
Median	6.627	-0.400	-0.150	3,708
SD	6.581	8.853	6.174	4,662
Observations	411	399	387	411
Panel D: State Non-Simultaneous Elections				
	Real Growth Rate	1-Year Growth Diff.	2-Year Growth Diff.	1981 Real PC GSDP
Mean	6.426	0.005	-0.201	3,587
SE(Mean)	0.203	0.271	0.185	141
Median	6.414	0.168	0.020	2,963
SD	5.388	7.069	4.691	3745
Observations	707	678	642	707

Notes: This table presents descriptive statistics for data sources used in this paper. Panel A presents summary statistics for all national elections between 1952-2023. Real GDP, fiscal deficit of the central government and gross fixed capital formation are given as percentage points of GDP. Capital-to-current spending ratio is given in percentage terms of revenue spending. The state×year sample includes 28 states and 3 union territories over 1982–2023 for a total of 1,118 observations. Panel B provides the state×year panel data (full sample: 1982-2023), including the treatment (simultaneous election) group in Panel B and the control group in Panel C. For three variables, annual real GSDP growth rate, the 1-year pre-post differences in state GSDP growth rates, the 2-year pre-post differences in state GSDP growth rates, and the initial GDP per capita in 1981 given in constant 1981 rupees. SE(Mean) denotes the standard error of the mean. Statistics for state growth are all in percentage points of GSDP.

Table A2: Test for reverse causality of GSDP growth on election timing

	(1)	(2)	(3)	(4)
VARIABLES	Sim Elec	Sim Elec	Sim Elec	Sim Elec
GSDP Growth %	−0.00106	−0.00116	−0.000577	−0.000921
	(0.00103)	(0.00114)	(0.000655)	(0.00120)
Constant	0.00536	−6.94e-05	−0.0120	−0.0119
	(0.00623)	(0.00172)	(0.0243)	(0.0191)
Observations	245	229	245	229
R-squared	0.986	0.987	0.987	0.989
State FE	NO	NO	YES	YES
Year FE	YES	YES	YES	YES
State×Year FE	NO	NO	NO	NO

Notes: Across the full sample, we find no significant relationship between the incidence of simultaneous versus non-simultaneous elections and states' real GSDP growth rates. This null result is robust to the inclusion of various fixed effects. The regressions are weighted by the states' GSDP in 1981. Standard errors are clustered at the state-level and report in parentheses. ***, **, and * denote statistical significance at the 1, 5, and 10 percent levels.