

Do Institutions Cause Strategic Voting?

Evidence from Taiwan

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March 29, 2026

Abstract

Electoral institutions are known to shape strategic voting, yet most evidence comes from parliamentary democracies. Whether the same logic applies outside parliamentary systems remains less well understood. This study examines how electoral reform affected strategic voting in Taiwan, a semi-presidential democracy. In 2008, Taiwan changed its parliamentary electoral system from multi-member to single-member districts, while local council elections remained under multi-member rules. Exploiting this reform in a difference-in-differences design and supplementing the analysis with individual-level survey evidence, I find a significant rise in strategic voting following the reform. This effect is stronger in districts with larger seat reductions, greater electoral competitiveness, and prior minor-party presence. Survey evidence further shows that supporters of minor parties were more likely to vote strategically or shift their party identification. Overall, the evidence suggests that behavioral change was driven more by voters than by parties, and that adjustment occurred rapidly following the institutional change.

Keywords: Strategic Voting, Electoral Reform, District Magnitude, Semi-Presidential

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1 Introduction

Voters do not always support the candidate they most prefer. One reason is that voting is not purely expressive because people care about outcomes as well as preferences (Aldrich et al., 2018). If supporting a weaker candidate increases the likelihood of an even less desirable outcome, some voters may instead choose a more competitive alternative. A classic argument associated with Duverger (1954) and later formalized by Cox (1997) suggests that such incentives become stronger as district magnitude declines. When only one seat is available, supporting a nonviable candidate becomes costly, prompting voters to shift toward more competitive contenders.

Most empirical evidence for this argument comes from parliamentary systems, where legislative elections directly shape executive formation (Moser & Scheiner, 2009; Cox, 1997). Semi-presidential systems provide a useful contrast because executive power is not determined solely by legislative seat distribution (Samuels & Shugart, 2010). As a result, legislative elections in these systems are less tightly linked to government formation, potentially weakening incentives for voters to coordinate behind viable candidates. This dynamic is more pronounced in president-parliamentary systems (Shugart & Carey, 1992), such as Taiwan's, where the president can dismiss the cabinet without parliamentary approval. In such settings, legislative elections may be less consequential for executive control and therefore provide a less favorable environment for strategic voting than the classic parliamentary cases on which much of the literature is based.

Weaker executive linkages do not eliminate the possibility of strategic voting. Presidential elections may still influence legislative competition, particularly when the two contests occur within the same electoral cycle (Stoll, 2015; Clark & Golder, 2006; Rich, 2018). Repeated two-party presidential races can reinforce perceptions that only major-

party candidates are electorally viable, and these perceptions may spill over into legislative contests.

However, presidential spillovers alone may be insufficient to generate widespread strategic voting. Whether viability perceptions translate into strategic voting depends critically on district magnitude. When legislative electoral districts return multiple seats, more candidates remain electorally viable, reducing incentives for voters to coordinate behind only the strongest contenders. By contrast, when district magnitude is sharply reduced, votes cast for non-viable candidates are more likely to be wasted, strengthening incentives to support major-party candidates. The key question is whether district magnitude remains a primary driver of strategic voting even outside the parliamentary settings from which much of the classic evidence is drawn.

Taiwan's 2008 electoral reform provides a direct opportunity to evaluate this question. The reform replaced multi-member districts elected under single nontransferable vote (SNTV-MMD) with single-member districts (SMD), sharply reducing district magnitude while leaving the broader regime structure unchanged. This institutional shift allows us to assess whether strategic voting intensifies when the competitive field is narrowed, even in a setting where legislative elections are not tightly linked to executive formation. Strategic voting is measured using the second-to-first loser ratio (SF ratio), an indicator of vote concentration among trailing candidates. The analysis therefore evaluates whether reductions in district magnitude systematically increase tactical voting in this institutional context.

To identify the effect of reform, I compare parliamentary elections to local council elections, whose electoral rules remained unchanged from 1998 to 2018.¹ Using village-

¹ The local council elections examined in this paper include city, county, and municipal councils. Under Taiwanese law, sub-national administrative units are classified as cities, counties, or municipalities, depending on their population size. However, these councils share the same electoral rules and perform

level data and a difference-in-differences design, I assess whether strategic voting increased after the reform in parliamentary elections relative to the local council elections. This comparison helps isolate the effect of institutional change from broader cross-context differences such as regime type, political culture, and other higher-level institutional features, providing a cleaner estimate of how magnitude reduction shapes voter behavior.

The results show that strategic voting increased in parliamentary elections following the reform, relative to local council contests. The increase was largest in districts that experienced more substantial seat reductions and in areas that were electorally competitive before the reform. This shift emerges immediately after the reform, suggesting that strategic adaptation can occur quickly. It also points to a more rapid adjustment process than is often implied in accounts of electoral coordination that emphasize voter learning or informational constraints (Díaz, 2024; Moser & Scheiner, 2009). These patterns are not easily explained by changes in candidate supply. Changes in nomination strategy, party coordination, and PR ballot introduction do not account for the observed shift in vote concentration. Survey evidence further indicates that supporters of smaller parties became more likely to vote for major-party candidates after the reform. These findings suggest that Taiwan provides a useful boundary-condition test for magnitude-based theories of strategic voting. Even where legislative elections do not directly determine executive survival, reducing their district magnitude still generates strategic voting.

This study contributes to the literature in three ways. First, by exploiting within-country institutional reform alongside a contemporaneous control election, it isolates the effect of district magnitude without relying on cross-national comparisons that bundle electoral rules with broader political differences. Second, it shows that the effect of magnitude reduction on strategic voting varies with district-level characteristics, with stronger

similar functions, primarily overseeing local governments.

responses in districts that experienced larger seat reductions and in those that were more electorally competitive before the reform. Third, by distinguishing voter-level behavior from party-level entry decisions, it identifies strategic desertion as a voter-driven phenomenon rather than a product of elite supply-side contraction. These findings suggest that strategic voting pressures are driven by the structure of election itself, rather than by executive formation stakes.

2 Theoretical Framework

2.1 District Magnitude and Strategic Voting Incentives

If strategic voting depends on candidate viability, then district magnitude should play a central role in shaping those incentives. In plurality systems, a smaller district magnitude raises the viability threshold and narrows the set of candidates perceived as competitive. [Cox \(1997\)](#) formalizes this intuition, arguing that the number of competitive candidates approaches $M + 1$ in districts with M seats. When $M = 1$, competition typically consolidates around two candidates. He illustrates this logic by comparing British single-member districts with Japanese multi-member districts under SNTV, where strategic voting appears stronger in the former. Although these cases differ along several institutional dimensions, the comparison suggests that reductions in district magnitude may heighten strategic incentives. Voters who favor trailing options thus face a trade-off between expressing their sincere preference and backing a more viable contender. Related arguments concerning pivotal voting and strategic behavior appear in earlier theoretical work ([Palfrey, 1989](#); [Myerson & Weber, 1993](#)).

Still, it remains unclear to what extent these patterns can be attributed specifically to

district magnitude. Much of the empirical evidence, including illustrative cross-national comparisons such as those in Cox (1997) and Moser & Scheiner (2009), relies on cases that differ along multiple dimensions. Electoral rules, party systems, and political contexts often vary simultaneously, making it difficult to isolate the independent behavioral effect of district magnitude. Observed vote concentration may therefore reflect these broader institutional and contextual differences rather than the effect of magnitude alone.

A within-country reform provides a cleaner way to study this question. If district magnitude changes while most other features of the political system remain broadly stable, it becomes easier to observe whether voters adjust their behavior under the new rules. However, even within a single country, additional challenges remain. Taiwan's 2008 parliamentary electoral reform was accompanied by several simultaneous institutional changes beyond the shift to single-member districts, and it is not straightforward to attribute the observed shifts in voter behavior solely to the reduction in district magnitude. So the key question is whether the shift in strategic voting is mainly driven by seat reduction rather than by other aspects of the reform. The following subsections lay out how this argument is tested empirically.²

Hypothesis 1 (Magnitude Effect). *A reduction in district magnitude increases strategic voting.*

2.2 Variation in Seat Reduction and Strategic Voting

Institutional reforms rarely affect all constituencies in the same way. In Taiwan's case, some districts experienced much larger reductions in seats than others. Districts that had

² Electoral reforms can produce both mechanical and psychological effects (Fiva & Folke, 2016). Because this study is concerned with whether voters behaviorally respond to changes in district magnitude, the focus is on psychological effects, specifically whether voters adjust their vote choices under the new electoral rules, rather than on the mechanical redistribution of seats.

previously elected several representatives saw sharper contractions, while others changed only modestly. These uneven adjustments likely reshaped local competition to different degrees.

Theory suggests that the number of viable candidates depends on district magnitude (Cox, 1997). When several seats are available, candidates can survive with more dispersed support because the threshold for representation is comparatively low. As seats are removed, that threshold rises. Competition tightens, and the space for marginal contenders narrows. Larger reductions should amplify the opportunity cost of backing lower-ranked candidates, making strategic defection more attractive.

Strategic behavior depends heavily on expectations, especially beliefs about who is competitive and whether one's vote might be pivotal (Palfrey, 1989; Myerson & Weber, 1993). If voters cannot clearly identify front runners, they have less reason to abandon their preferred candidates. As Heath & Ziegfeld (2022) show in the Indian case, strategic voting can remain rare not because voters are unwilling to desert weak candidates, but because partisan attachments distort beliefs about which parties are locally competitive. More generally, electoral uncertainty makes it harder for voters to distinguish viable from nonviable candidates, and can inhibit tactical voting even when incentives to defect are present (Herrmann, 2012).

District magnitude influences not only incentives but also the informational clarity of electoral competition (Carey & Hix, 2011). As the number of seats increases, the set of potentially viable candidates expands, making it harder for voters to distinguish serious contenders from marginal ones. Large magnitude districts are thus more difficult to navigate strategically because voters must evaluate a larger and less clearly ordered field of candidates. When the number of seats decreases, the threshold for viability increases,

which tends to eliminate marginal contenders and sharpen the distinction between leading and trailing candidates. In cases of substantial magnitude reductions, the structure of competition becomes easier to interpret. Fewer candidates appear realistically viable, and the gap between the frontrunners and others becomes more visible. By contrast, smaller reductions may not substantially alter the informational environment, leaving the competitive landscape relatively ambiguous.

If strategic voting depends on identifying viable candidates, voter responses should vary according to the clarity with which reform changes the competitive environment. Larger reductions in district magnitude should generate stronger shifts toward strategic voting, whereas more modest changes may produce only limited adjustments. This expectation suggests a second implication:

Hypothesis 2 (Magnitude of Seat Reduction). *The greater the reduction in district magnitude, the larger the increase in strategic voting.*

2.3 Constituency Competitiveness and Strategic Voting

A key precondition for strategic voting is electoral uncertainty. Where one candidate dominates overwhelmingly, the incentive to vote strategically is limited because the outcome is largely predetermined. In contrast, in closely contested races, voters face greater uncertainty about which candidates are viable and therefore stronger incentives to vote tactically (Palfrey, 1989).

Empirical research shows that strategic voting tends to be more common in competitive settings and in places where smaller parties receive meaningful levels of support (Blais et al., 2011; Meffert & Gschwend, 2011). These features of the electoral environment likely condition how voters respond when the district magnitude changes. In constituen-

cies where the vote-share gap between the major parties is narrow, election outcomes are less predictable. Small shifts in support can determine the winner. When the magnitude is reduced to a single seat, the consequences of backing a trailing candidate become more consequential, as only one contender can be elected. In closely contested districts, the perceived cost of casting a vote for a non-viable candidate is higher, which may encourage voters to reconsider their initial preferences.

A similar logic applies in areas where minor parties previously attracted substantial support. Under multi-member districts, dispersed backing across several candidates can still yield representation. After the transition to single-member districts, this possibility largely disappears. Votes cast for minor-party candidates are less likely to produce representation, making strategic defection toward one of the major parties more plausible, particularly where third-party competition had once been meaningful.

Thus, the effects of magnitude reduction are unlikely to be uniform across constituencies. They should be more pronounced in districts that were competitive prior to the reform and in places where minor parties had maintained a noticeable presence.

Hypothesis 3 (Heterogeneous Effects by Electoral Context). *The effect of magnitude reduction on strategic voting is larger in more competitive constituencies and in areas where smaller parties previously held seats.*

2.4 Supply-Side Adaptation and Voter-Level Adjustment

Electoral reform does not only shape voter incentives. It can also change how parties behave. When district magnitude shifts, parties may reconsider how many candidates to nominate, where to concentrate resources, or whether to enter at all. Earlier work shows that parties respond strategically to these institutional signals, adjusting entry and

coordination in ways that influence how votes are distributed (Clark & Golder, 2006). Research on plurality and mixed-member systems also finds that nomination strategies change after reforms (Moser & Scheiner, 2009; Stoll, 2015).

Taiwan's party system before the 2008 reform shows why this distinction matters. Under SNTV-MMD, some minor parties were able to gain legislative seats by mobilizing geographically concentrated support, even without winning a plurality in any single district. The shift to single-member districts changed this situation. With only one seat per district, the threshold for representation increased sharply. Parties that had relied on support spread across multi-member constituencies now faced pressure to rethink their nomination strategies.

If minor parties responded by withdrawing candidates or coordinating with major parties, the decline in vote fragmentation after the reform may reflect elite-level adaptation. It would not necessarily indicate changes in voter behavior. By contrast, if parties continued to nominate candidates despite weaker prospects, a concentration of votes on major-party candidates is more likely to reflect voters abandoning their preferred options under the new rules.

Therefore, separating voter responses from party-level adjustments is essential. If magnitude reduction operates primarily by altering voters' incentives, we should observe increases in strategic desertion even when patterns of candidate entry remain broadly similar. Conversely, if changes in nomination or party entry drive the decline in vote fragmentation, the reform effect should disappear once nomination regimes are held constant.

In the empirical analysis, I conduct a series of tests designed to distinguish voter-driven strategic voting from party-level adjustments. First, I examine whether patterns of party nomination changed systematically following the reform. If the observed effect were driven

primarily by supply-side adaptation, we would expect observable shifts in small-party entry, coordinated withdrawals, or reductions in the number of candidates nominated in district races. Hence, I analyze changes in nomination strategies and candidate counts and estimate difference-in-differences models within subsamples where small-party nomination patterns and the number of candidates remain constant before and after the reform.

In addition, I turn to individual-level survey data to examine whether voters themselves altered their behavior following magnitude reduction. In particular, I test whether supporters of minor parties became more likely to cast their district votes for major-party candidates after the reform. Evidence of such within-voter behavioral change would indicate strategic voting at the individual level rather than a mechanical consequence of altered nomination strategies or candidate supply. These analyses directly evaluate whether the observed increase in strategic voting reflects voter-driven strategic behavior rather than party-driven changes in candidate entry.

The hypotheses outlined above also speak to a broader theoretical question. That is, whether strategic voting shaped by district magnitude persists even when legislative elections do not directly determine executive turnover. In semi-presidential systems, legislative elections do not directly determine whether a government stays in office, which could weaken incentives for tactical voting. If the reduction in district magnitude in Taiwan still produces consistent patterns of tactical voting, this would suggest that the psychological effects of district magnitude are structurally embedded in electoral competition and do not depend on executive formation incentives to activate voter-level behavioral adjustments.

3 Research Design

3.1 Background of the 2008 Electoral Reform

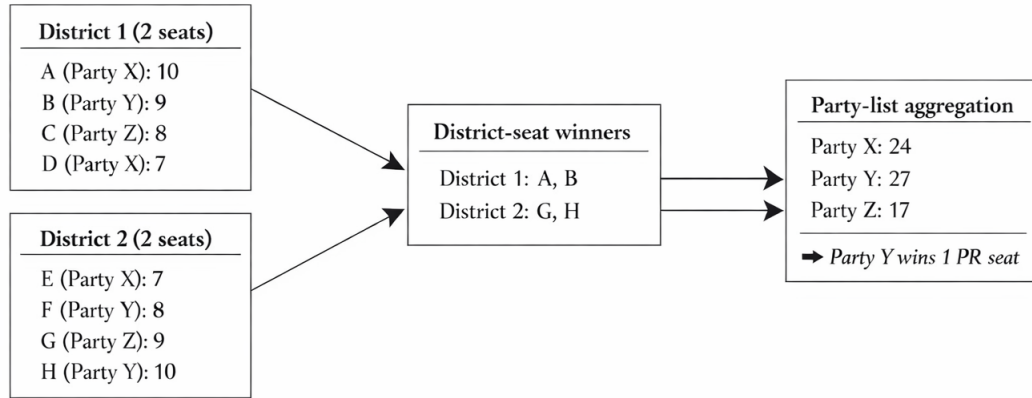
In 2008, Taiwan reformed its parliamentary electoral system. The reform was primarily driven by the two major parties, the Kuomintang (KMT) and the Democratic Progressive Party (DPP), which argued that the multi-member district system generated coordination problems and weakened electoral accountability. Consequently, the transition to a single-member district system became the central component of the reform ([Stockton, 2010](#)).

Prior to the reform, the legislature consisted of 225 seats, with elections held every three years. Of these, 176 (including 168 geographic constituencies and eight reserved seats for indigenous peoples) were elected under the single non-transferable vote in multi-member districts (SNTV-MMD), and 49 were allocated through a nationwide party-list proportional representation (PR) tier.³

A distinctive feature of the pre-reform system was its fused ballot structure. Each voter cast a single vote for a candidate in the district tier, and that vote simultaneously contributed to the allocation of seats in both the district and the PR tier. In other words, the same ballot was used to determine constituency winners under SNTV-MMD and to calculate party-list seat shares. Figure 1 provides a simplified illustration of this pre-reform electoral arrangement.

³ Non-indigenous voters cast ballots for their local constituency seats, whereas indigenous voters cast ballots in separate indigenous constituencies. Each voter participated only within their designated electoral category.

How Votes Translated into Seats under Taiwan's Pre-reform Electoral System
(4 district seats, 1 party-list seat)



Notes: Under the pre-reform system, voters cast one vote for an individual candidate in a multi-member district. These votes determined four district-seat winners and were also aggregated at the party level to allocate the single party-list seat.

Figure 1: Pre-Reform Electoral Rules

Several institutional changes were implemented after the reform. First, the total number of legislative seats was reduced from 225 to 113, and the electoral cycle was extended from three to four years. Second, all multi-member districts were replaced by single-member districts, constituting the core structural change of the reform. Third, Taiwan adopted a dual-ballot mixed-member system. Voters now cast two separate ballots, one for a candidate in the SMD tier and one for a party in the nationwide PR tier.

This reform transformed Taiwan from a fused-ballot SNTV-MMD system into a mixed-member system with single-member districts and separate PR voting. A comparable institutional shift occurred in Japan's 1994 electoral reform, although important differences remain.⁴ Table 1 compares the pre- and post-reform electoral rules.

⁴ Unlike Japan, Taiwan does not allow dual candidacy. Candidates may compete either in a district race or on a closed party list, but not both.

Table 1: Parliamentary Electoral Rules Before and After the 2008 Reform

	Before	After
Total Ballots per voter	1	1 for SMD and 1 for PR
Total Seats	225	113
District Seats	168	73
# of the seats in the local district	1 - 13	1
PR List Seats	49	34
Indigenous Reserved Seats	8	6

Because these reforms were adopted simultaneously, they amount to a broader institutional shift rather than a change in a single rule. This makes it harder to attribute subsequent changes in strategic voting to any one element of the reform. Several features changed simultaneously, and each could plausibly influence electoral behavior. The later analysis (Sections 4.1 and 4.2) examines these components separately. In particular, it considers the reduction in district magnitude, possible adjustments in party nomination strategies, and the introduction of a separate PR ballot. The aim is to determine which of these changes is most closely associated with the observed rise in strategic voting and whether the underlying mechanism primarily reflects voter responses or party-level adaptation.

3.2 Measurement of Strategic Voting

To measure strategic voting, I use the SF ratio following [Cox \(1997\)](#). The measure compares the vote share of the second-highest losing candidate to that of the highest losing candidate in a given electoral contest. Candidates in constituency i at election t are ordered by vote share from highest to lowest, and M_{it} denotes the number of seats. The first loser is the candidate ranked $(M_{it} + 1)$, and the second loser is ranked $(M_{it} + 2)$.

The SF ratio is defined as

$$SF_{it} = \frac{V_{it}^{(M_{it}+2)}}{V_{it}^{(M_{it}+1)}}. \quad (1)$$

In single-member districts ($M_{it} = 1$), this reduces to the vote share of the third-ranked candidate divided by that of the second-ranked candidate. Lower values indicate stronger strategic voting. When voters desert the third-ranked candidate in favor of the second-ranked candidate, the third-ranked candidate receives far fewer votes, pushing the ratio toward zero.

In multi-member districts ($M_{it} > 1$), the interpretation follows the same logic but shifts according to the number of seats. The first loser is the candidate ranked ($M_{it} + 1$), the highest vote-getter who fails to secure a seat, while the second loser is ranked ($M_{it} + 2$), the next highest among the non-elected candidates. The SF ratio compares the vote share of the second-highest losing candidate to that of the highest losing candidate. A lower ratio indicates that support among non-winning candidates concentrates more heavily on the most competitive loser, whereas a higher ratio implies that votes remain dispersed across multiple trailing candidates even below the winning threshold.

The SF ratio is usually calculated at the constituency level. However, because constituency boundaries were redrawn after the 2008 reform, a consistent constituency-level panel cannot be constructed across electoral cycles. To maintain geographic comparability before and after the reform, I calculate the SF ratio at the village level, the smallest administrative unit that can be consistently mapped over time. In this study, the village-level SF ratio serves as a measure of strategic voting intensity within local communities. As shown later in Section 4.1, aggregate patterns at the constituency level mirror those observed at the village level, indicating that the substantive interpretation of the measure

remains unchanged.

3.3 Data and Identification Strategy

To estimate the effect of magnitude reduction, I compare parliamentary elections before and after the 2008 reform to local council elections whose electoral rules remained unchanged. Prior to 2008, both elections were conducted under the SNTV-MMD system. After the reform, parliamentary elections shifted to single-member districts, while local council elections retained the multi-member format. Parliamentary elections constitute the treatment group, and local council elections serve as the control group.⁵

While parliamentary and local council elections naturally differ, local council elections can still serve as an appropriate counterfactual. Indeed, a small but growing literature uses different types of elections as treatment and control groups in similar frameworks to identify causal effects of electoral reforms (Ponattu, 2018; Ishima, 2020; Profeta & Woodhouse, 2022; Papagni et al., 2023). More specifically, many parliamentarians have previously served as local council members, suggesting that the two arenas draw from an overlapping pool of political actors competing on different platforms. In addition, the parallel trends in the SF ratio hold empirically and are further supported by robust statistical tests (See Figure 2).

Because constituency boundaries were redrawn following the reform, I rely on village-level data to maintain a consistent panel structure over time. The empirical strategy employs a difference-in-differences design:

$$SFRatio_{it} = \beta_0 + \beta_1 Parl_i + \beta_2 Post_t + \beta_{DD}(Parl_i \times Post_t) + \alpha_i + \gamma_t + \epsilon_{it} \quad (2)$$

⁵ Data retrieved from [Central Election Commission, R.O.C. \(n.d.\)](#).

where α_i denotes village fixed effects and γ_t denotes election-year fixed effects. The interaction term captures whether strategic voting increased in parliamentary elections relative to local elections following the reform.

To examine whether behavioral adjustment varies with the magnitude of seat contraction, I estimate this using a triple-differences (DDD) specification:

$$\begin{aligned}
SFRatio_{it} = & \beta_0 + \beta_1 Parl_i + \beta_2 Post_t + \beta_3 ReducedSeats_i \\
& + \beta_4(Parl_i \times Post_t) + \beta_5(Parl_i \times ReducedSeats_i) \\
& + \beta_6(Post_t \times ReducedSeats_i) \\
& + \beta_{DDD}(Parl_i \times Post_t \times ReducedSeats_i) \\
& + \alpha_i + \gamma_t + \epsilon_{it}
\end{aligned} \tag{3}$$

Standard errors are clustered at the electoral district level to account for correlated shocks across villages nested within the same constituency. Because villages within a district share candidate environments and electoral contexts, error terms are likely correlated within districts. Results are robust to clustering at the village level and to two-way clustering by constituency and county, as well as by constituency and village. The dataset covers elections from 1998 to 2018 and includes six parliamentary and six local elections, evenly divided before and after the reform. Table A1 provides a detailed timeline indicating which elections are included in the pre- and post-reform periods.

The key identifying assumption is that, absent institutional change, trends in strategic voting would have evolved similarly across the two election types. This assumption is plausible because both elections operated under identical SNTV-MMD rules prior to 2008 and involved the same electorate. Figure 2 plots difference-in-differences estimates for

each wave relative to the reform, with the last election before the reform as the baseline, and shows that pre-reform coefficients are close to zero and statistically insignificant, consistent with the parallel trends assumption.⁶

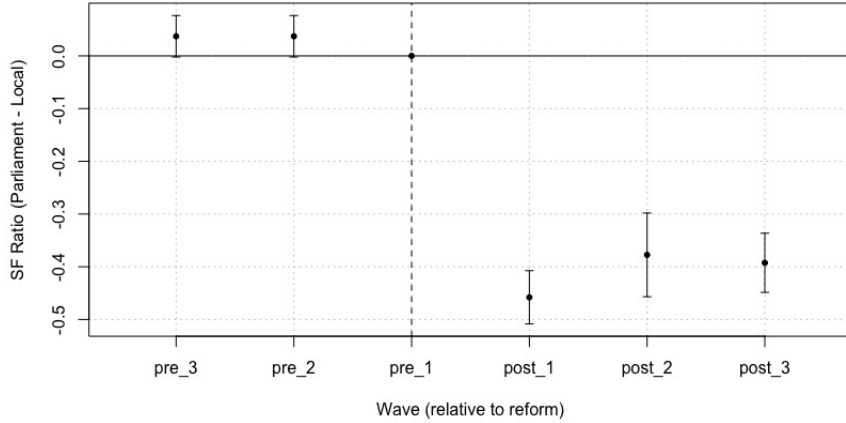


Figure 2: Event Study Estimates of the Reform Effect

4 Empirical Results

4.1 Main Results

Figure 3 reports the distribution of the SF ratio across constituencies in the 2004 (pre-reform) and 2008 (post-reform) parliamentary elections. Under the pre-reform multi-member system, most constituencies have SF ratios between 0.9 and 1. In these districts, the first and second losers receive similar vote shares. This pattern is consistent with a non-Duvergerian equilibrium (Cox, 1997). When trailing candidates appear similarly viable, incentives for strategic voting are limited. The near parity between the two leading

⁶ For parliamentary elections (treatment), pre_3, pre_2, and pre_1 correspond to 1998, 2001, and 2004, respectively, while post_1, post_2, and post_3 correspond to 2008, 2012, and 2016. For local council elections (control), the corresponding waves map to 1998, 2002, 2005, 2009, 2014, and 2018. Because parliamentary and local elections are not held in the same calendar years, each wave pairs the nearest pre- or post-reform elections across the two levels. Prior to 2014, local council elections in special municipalities were sometimes held within a year of those in other jurisdictions. Given that the number of special municipalities was limited, I harmonize election timing by grouping the 2005 and 2006 elections as 2005, and the 2009 and 2010 elections as 2009.

losers indicates relatively weak strategic voting among voters.

After the reform, the distribution shifts toward lower values. In 2008, a large proportion of constituencies exhibit SF ratios between 0 and 0.1. The second loser receives substantially fewer votes than the first loser, suggesting that competition is concentrated on two leading candidates. The third-ranked candidate attracts comparatively little support, consistent with a Duvergerian equilibrium. Overall, these patterns are consistent with the argument that reducing district magnitude strengthened strategic voting incentives and increased strategic voting.

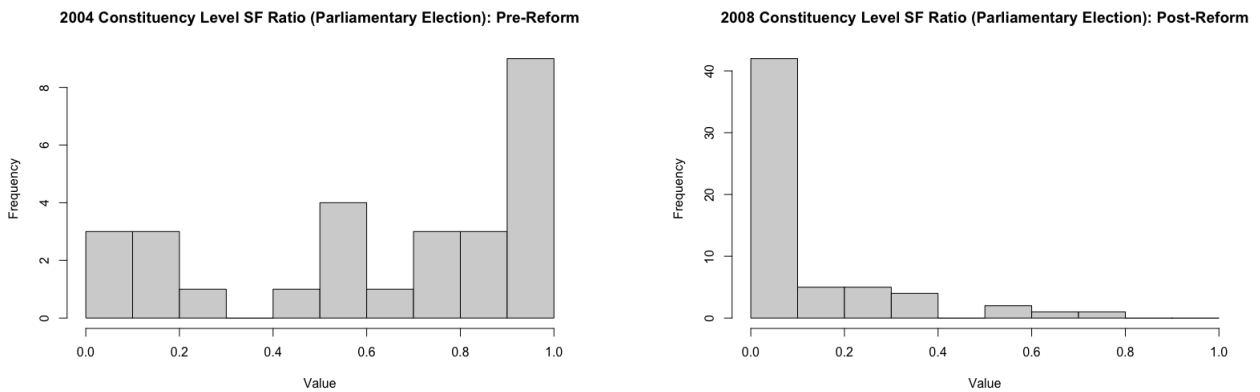


Figure 3: Constituency Level SF Ratio (Parliamentary Election)

Some differences appear when comparing these findings with [Cox \(1997\)](#). Cox draws on British lower house elections as an example of single-member districts and Japanese lower house elections to represent multi-member districts. In both settings, he rejects the null hypothesis of unimodality. Under a purely strategic account, the distribution of SF ratios should be bimodal, with districts clustering either near zero (Duvergerian equilibrium) or near one (non-Duvergerian equilibrium). Taiwan does not show this pattern. In both 2004 and 2008, the null of unimodality cannot be rejected.⁷ Instead of splitting into two distinct groups of districts, the distribution in each year is organized around a single main

⁷ Hartigans' dip test yields p-values of 0.6261 (pre-reform) and 0.9778 (post-reform).

peak.

What changes across elections is not the number of modes but their position. Prior to reform, the peak lies close to one, indicating that most districts were closer to a non-Duvergerian equilibrium. After the shift to single-member districts, the center of the distribution moves toward zero. The mass of districts now falls in a range associated with Duvergerian outcomes. Cox's evidence points to the coexistence of multiple equilibria within the same institutional framework. In Taiwan, by contrast, the reform coincides with a broad shift from one dominant equilibrium to another rather than simultaneous clustering at both extremes.

A comparison of Taiwan's district-level SF ratios with those of other countries with a mixed-member system, as discussed in reference to [Moser & Scheiner \(2009\)](#), reveals that the average SF ratio in Taiwan after the reform (0.12) is significantly lower than the average SF ratio in established democracies (0.36) and new democracies (0.61) in the aforementioned dataset. [Moser & Scheiner \(2009\)](#)'s argument is that new democracies tend to have poorly institutionalized party systems, which results in voters lacking sufficient information to make strategic decisions. As a result, voters in nascent democracies are less inclined to engage in strategic voting, as evidenced by elevated SF ratios. Nonetheless, the case of Taiwan represents an exception to this general rule. Despite the country's relatively brief experience with democracy, most voters are able to identify the likely winners and vote tactically, even after just over a decade.⁸

Because constituency boundaries were redrawn after the reform, comparing the same villages before and after provides a more consistent basis for assessing behavioral change.

Figure 4 presents the SF ratios at the village level.

⁸ The starting point of Taiwan's democratization is contested because democratization is often seen as the outcome of a series of events. Here, I follow [Rigger \(1999\)](#)'s procedural definition, which identifies Taiwan's 1996 presidential election as the benchmark.

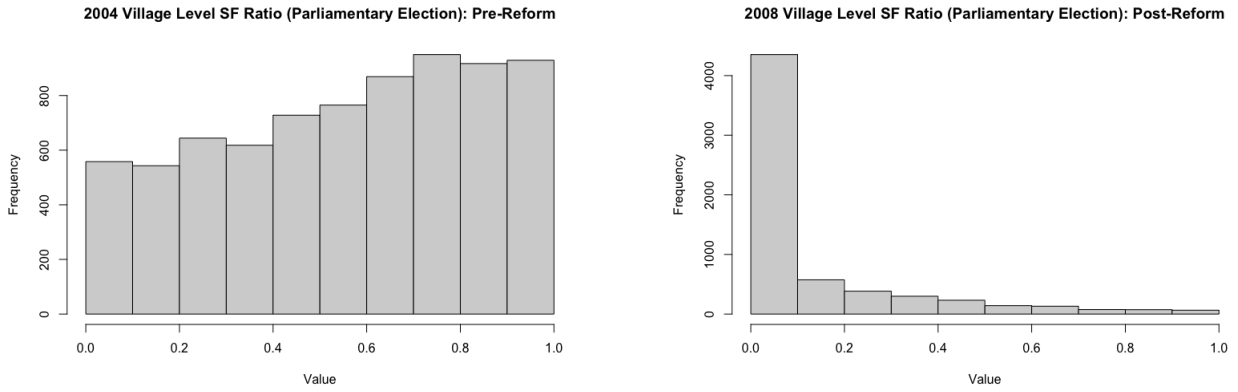


Figure 4: Village Level SF Ratio (Parliamentary Election)

The SF ratio at the village level in 2004 exhibits a distribution that is nearly uniform, but the distribution in 2008 exhibited a distribution that is nearly unimodal. The village-level SF ratio distribution observed in the 2004 election appears to diverge from the constituency SF ratio distribution. The explanation for this discrepancy is that the majority of constituencies in 2004 encompassed a considerable number of villages, with an average of 200 to 300 villages per constituency. The aggregated results at the village level display a distinctive pattern. Nevertheless, both figures convey the same message: that few voters engaged in strategic voting in 2004, as evidenced by the limited number of villages with an SF ratio close to 0. A comparison of the same village before and after the reform indicates that the SF ratio of the majority of villages (87%) decreased. Moreover, a t-test is performed on the SF ratio of 2004 and 2008 in the same village to determine the statistical significance of the observed difference between the two elections. The t-value is -92.81, indicating a statistically significant decrease (with a 95% confidence interval) in the SF ratio at the same village following the reform.

In contrast, the SF ratio distributions in local council elections prior to and subsequent to the reform (which entailed no alteration to the electoral rules) demonstrate a notable degree of similarity. Figure 5 illustrates the distributions in the pre- and post-reform

periods. Furthermore, a t-test is employed to determine whether the observed discrepancy between the two elections are statistically significant. The t-value is -0.7, indicating that the SF ratio of the local council election is statistically indistinguishable before and after the reform.

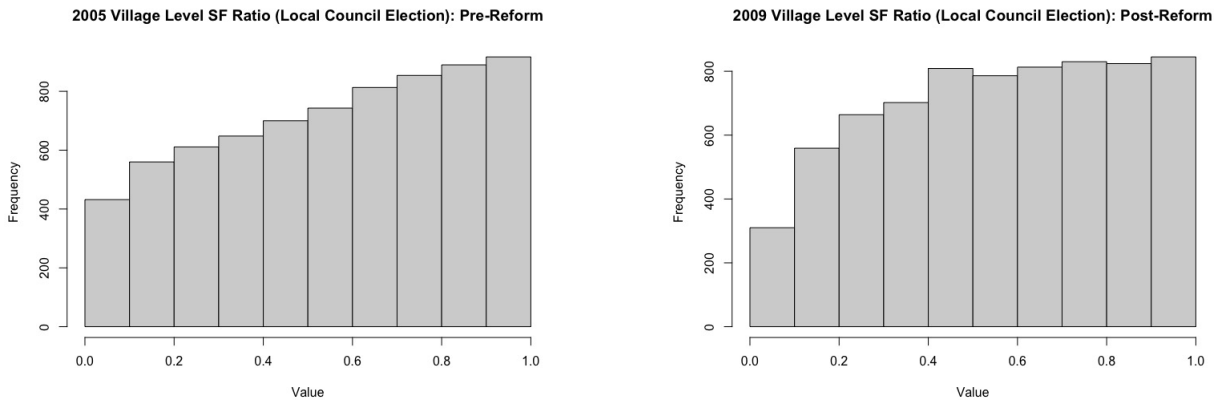


Figure 5: Village Level SF Ratio (Local Council Election)

Table 2 reports the difference-in-differences estimates using data from parliamentary elections and local elections observed before and after the reform. Model 1 tests Hypothesis 1 by estimating the baseline effect of the reform on the SF ratio. The DiD coefficient is negative and statistically significant, indicating that the shift from a multi-member to a single-member system is associated with a lower SF ratio. In substantive terms, this implies greater concentration of votes among leading candidates after the reform. Model 2 tests Hypothesis 2 by examining whether the magnitude of seat reduction predicts the intensity of strategic voting. The interaction term remains negative and significant. On average, reducing one seat in a district corresponds to a decline of about 0.012 in the SF ratio. Districts that experienced larger contractions show stronger movement toward vote concentration. This pattern is consistent with the argument that clearer competitive constraints make strategic voting more frequent.⁹

⁹ See Figure A1 in the appendix for DiD estimates under alternative standard error clustering assumptions.

Information likely plays a role. Before the reform, many constituencies, both parliamentary and local, had more than five seats, accounting for roughly 60 percent of observations.¹⁰ In such settings, identifying likely winners is not straightforward. When signals are unclear, voters have less reason to abandon preferred candidates. After the reform, with fewer seats at stake, the competitive structure becomes simpler, and viable contenders are easier to identify. The results from Model 2 are consistent with this interpretation.

The post-reform decline in the SF ratio is substantial. Under the previous multi-member system, smaller parties were able to win some seats, and it would have been reasonable to expect some of that pattern to continue after the transition to single-member districts.¹¹ However, the estimates point in a different direction. Votes became more concentrated on the top two candidates once district magnitude was reduced.

¹⁰ See Figure A2 in the appendix.

¹¹ In a 2005 interview, the Secretary-General of the Taiwan Solidarity Union (TSU), which was the fourth-largest party at the time, stated that they believed the effects of the reform would not occur immediately (Peng & Shi, 2004).

Table 2: Main Difference-in-Differences Results

	<i>Dependent Variable: SF Ratio</i>	
	(1)	(2)
Post \times Parliamentary	-0.408*** (0.026)	-0.330*** (0.039)
Post \times Parliamentary \times Number of Decreasing Seats		-0.012* (0.005)
Village FE	YES	YES
Election Cycle FE	YES	YES
Observations	76,466	76,466
R ²	0.482	0.485
Within R ²	0.270	0.273

*p<0.05; **p<0.01; ***p<0.001. Robust standard errors are in parentheses and clustered by constituency. “Number of Decreasing Seats” refers to the reduction in the number of seats allocated to each parliamentary constituency following the 2008 reform, calculated as the difference between the pre- and post-reform seat count. Higher values indicate larger reductions in district magnitude.

To explore which types of constituencies are more likely to exhibit strategic voting, I focus on two features of the pre-reform electoral context, motivated by Hypothesis 3. The first is electoral competitiveness, captured by the pre-reform vote-share gap between the KMT and the DPP in parliamentary elections. Smaller gaps imply closer races and less certainty about which candidate was viable under a winner-take-all rule. The second reflects whether voters had access to viable alternatives, measured by the prior presence of small-party representation in the village. Both variables are constructed from parliamentary elections held before the reform (1998, 2001, and 2004). Pre-trend tests for heterogeneous effects confirm parallel trends across subgroups prior to the reform (Appendix Figure A3 and A4).

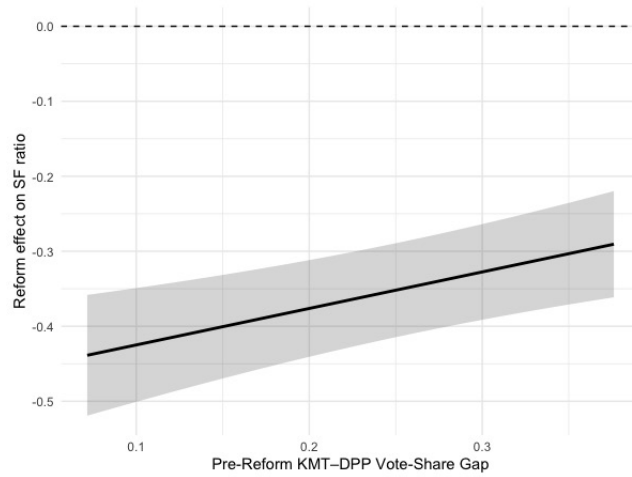
Figure 6 examines how the reform-related decline in the SF ratio varies across these vil-

lages, providing a test of Hypothesis 3. The estimates come from difference-in-differences regressions that interact the reform indicator with pre-reform village characteristics and include district fixed effects.¹² The reduction in the SF ratio is larger in villages that were electorally competitive prior to the reform, that is, where the KMT–DPP vote-share gap was small. In villages with consistently large margins, the estimated reform effect is smaller. Where outcomes were already predictable, there was less reason for voters to reconsider their choices once the rules changed.

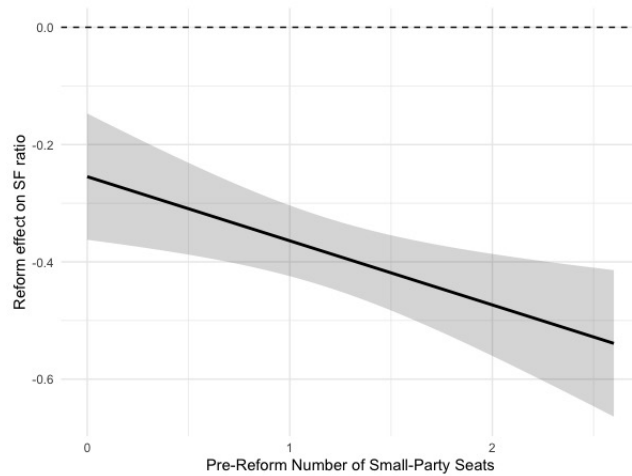
A similar pattern appears when considering small-party presence. Villages in which minor-party candidates had previously won seats exhibit a stronger post-reform decline in the SF ratio. In contrast, in villages long dominated by major parties, the estimated change is limited. Where third-party candidates had once been viable, reducing district magnitude seems to have altered strategic voting incentives more substantially.

Overall, the evidence is consistent with Hypothesis 3. Strategic voting is most visible in places where competition was close and minor parties had previously held seats. In environments where electoral outcomes were largely settled in advance, the reform produced little behavioral change. The next section turns to individual-level survey data to examine whether these aggregate patterns are reflected in voters' reported behavior.

¹² Appendix Table A2 reports the full regression results underlying Figure 6.



Panel A. Reform Effects by Pre-Reform Electoral Competitiveness



Panel B. Reform Effects by Pre-Reform Small-Party Presence

Figure 6: Heterogeneous Reform Effects on the SF Ratio

4.2 Alternative Explanations and Robustness Checks

The reform changed several things at the same time, so it is important to consider whether the decline in the SF ratio might reflect something other than voter responses to district magnitude. A first alternative concerns the supply side of electoral competition rather than voter behavior. The reform may have discouraged small-party entry, thereby reducing effective competition in SMD contests. If smaller parties nominated fewer candidates in response to the new electoral rules, the observed vote concentration could reflect a contraction in available choices rather than strategic behavior on the part of voters. An

examination of nomination patterns is therefore warranted.

Table 3 presents a summary of the number of candidates nominated and elected by the two major parties (KMT and DPP) and other minor parties in the 2008 elections. Both major and minor parties have continued to nominate candidates in accordance with the reform. It is notable that the probability of small parties winning elections has been significantly reduced. In the 2004 election, approximately 26% of constituency candidates were from several small parties, which still manage to secure approximately 23% of the constituency seats. Nevertheless, following the reform, 36% of candidates from small parties were still on the ballot, yet they were only able to secure 3% of the constituency seats. This suggests that voters are aware of the changes to the electoral procedures and, as a result, are engaging in strategic behavior in line with the revised rules.

Table 3: Number of Nominated and Elected Candidates in SMD Tiers

Party	2004 Parliamentary		2008 Parliamentary	
	# of Nominated (Elected)	% of total	# of Nominated (Elected)	% of total
KMT	70 (57)	19% (34%)	70 (57)	25% (78%)
DPP	90 (69)	24% (41%)	69 (13)	25% (18%)
Other Small Parties	95 (38)	26% (23%)	102 (2)	36% (3%)
Independent	113 (4)	31% (2%)	40 (1)	14% (1%)
Total	368 (168)	100% (100%)	281 (73)	100%(100%)

The difference-in-differences estimates in Table 4 further confirm this pattern. Given that the total number of seats was reduced by half, the ratio of candidates to seats is used as the dependent variable to provide a more accurate reflection of changes in nomination intensity. The results show that parties did not withdraw from the electoral process following the reform. On the contrary, the DID estimate is positive, and the interaction between the post-reform indicator and the reduction in district magnitude is not negative, indicating that parties did not strategically scale back their nomination efforts in response

to seat reductions. Despite the continued presence of non-major-party candidates on the ballot, voters increasingly concentrated their support on major-party candidates. Thus, the evidence suggests that the observed decline in SF reflects individual voter behavior in response to reduced district magnitude, rather than a contraction in candidate supply.

Table 4: Party Nomination Strategy

	<i>Dependent Variable: Number of Candidates Per Seat</i>	
	(1)	(2)
Post × Parliamentary	2.303*** (0.142)	2.163*** (0.280)
Post × Parliamentary × Number of Decreasing Seats		0.022 (0.035)
Village FE	YES	YES
Election Cycle FE	YES	YES
Observations	75,347	75,347
R ²	0.678	0.678
Within R ²	0.578	0.579

*p<0.05; **p<0.01; ***p<0.001. Control variables include the pre-reform electoral competitiveness and small party presence. Robust standard errors are in parentheses and clustered by constituency. “Number of Decreasing Seats” refers to the reduction in the number of seats allocated to each parliamentary constituency following the 2008 reform, calculated as the difference between the pre- and post-reform seat count. Higher values indicate larger reductions in district magnitude.

A second alternative explanation is that the introduction of a PR ballot reshaped party coordination strategies. Under mixed-member systems, minor parties often face limited prospects in SMD contests and may therefore coordinate with major parties by refraining from nominating SMD candidates, while relying on PR-tier support instead (Catalinac & Motolinia, 2021; Ferrara & Herron, 2005). Such coordination could, in principle, affect vote concentration in the SMD tier. Taiwan provides a suitable context to evaluate this possibility. Party competition is structured around two major camps, Pan-Blue and Pan-Green, defined by distinct positions on national identity and cross-strait relations (Hsu

& Lin, 2009; Niou, 2004; Wang & Liu, 2004; Wu, 2004). Within this system, the People First Party (PFP) and the Taiwan Solidarity Union (TSU) have historically represented electorally viable minor parties. In earlier legislative elections, both parties secured more than ten seats and ranked as the third or fourth largest parties in the legislature, indicating substantial organizational capacity and voter support. Patterns of coordination varied across elections. In 2008, the PFP coordinated with the KMT, while the TSU failed to reach an agreement with the DPP and nominated candidates independently. The situation reversed in 2012, when Pan-Green parties coordinated while Pan-Blue parties did not.¹³

To assess whether changes in party coordination account for the reform effect, I examine whether the decline in the SF ratio persists when nomination patterns are held constant. Figure 7 reports difference-in-differences estimates for subsamples of districts in which small parties consistently nominated SMD candidates both before and after the reform, as well as districts in which small-party nominations occurred throughout the period.¹⁴ In both cases, the reform effect remains negative and statistically significant, with magnitudes comparable to the full-sample estimates. In particular, the decline in the SF ratio persists even in districts where small parties continue to nominate candidates, indicating that the result is not driven solely by formal electoral coordination through candidate withdrawal. These findings suggest that although party coordination may shape electoral outcomes at the margin, changes in nomination strategy alone are insufficient to account for the observed decline in the SF ratio. Instead, the pattern is more consistent with magnitude-induced strategic voting at the voter level.

¹³ Although no formal agreement was reached between TSU and the DPP, TSU refrained from nominating SMD candidates, and DPP leaders publicly encouraged PR support for TSU (Wang et al., 2016).

¹⁴ Appendix Table A3 reports the regression results underlying Figure 7.

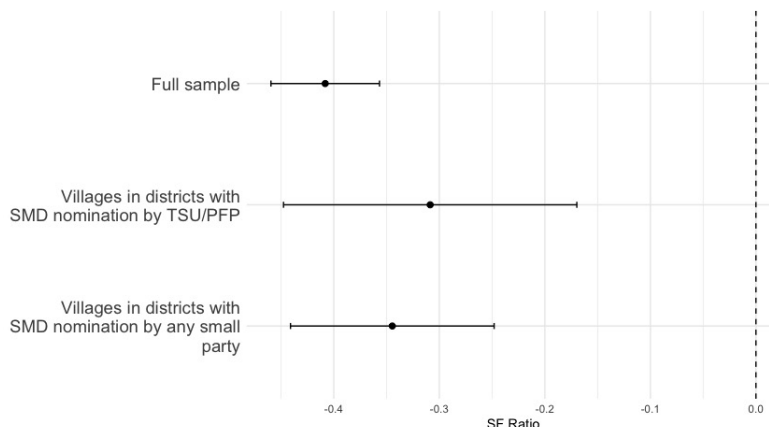


Figure 7: Reform effects on the SF ratio across nomination subsamples

A third alternative concern is that the introduction of a separate PR ballot may have independently altered voter behavior in the SMD tier, as voters could now use one ballot to express partisan preferences and another to support viable district candidates. Because the PR ballot was introduced uniformly across all parliamentary constituencies, its effect should be independent of the magnitude of seat reduction. The finding that larger reductions in district magnitude produce stronger declines in the SF ratio (Model 2 in Table 2) is more consistent with a magnitude-based mechanism than with a uniform PR ballot effect.

Additionally, I examine villages in constituencies where district magnitude remained unchanged before and after the reform, such that the only institutional change was the introduction of the PR ballot. I estimate two specifications. The first is a difference-in-differences model comparing constituencies where magnitude decreased against those where it remained unchanged. The second examines the SF ratio within the unchanged constituencies before and after the reform. The DiD estimate is negative and statistically significant, indicating that magnitude reduction produces a stronger decline in the SF ratio even after accounting for the PR ballot effect. The within-group estimate is negative but statistically insignificant. These results suggest that the PR ballot introduction is not the

main driver of the SF ratio decline.¹⁵

Several robustness checks are also conducted to assess the validity of the main results. First, I implement a placebo test by applying the same difference-in-differences specification to elections held prior to the reform, treating the 2004 parliamentary election as a placebo reform year. Figure 8 reports the estimated placebo difference-in-differences coefficients under alternative clustering assumptions for the standard errors. Across all specifications, the placebo estimates are small in magnitude and statistically indistinguishable from zero, indicating no evidence of a differential change in the SF ratio prior to the reform. The absence of any significant placebo effect suggests that the main findings are unlikely to be driven by pre-existing trends or spurious differences between parliamentary and local elections. Instead, the decline in the SF ratio appears only after the implementation of the reform.

Additional robustness analyses further support this conclusion. Appendix Figure A5 presents a leave-one-district-out jackknife analysis, showing that the estimated reform effect is not driven by any single district. Appendix Figure A6 reports a sensitivity analysis assessing the strength of unobserved confounding required to overturn the main results. These exercises indicate that the estimated reform effect is both stable and robust to alternative identifying assumptions.

¹⁵ See Table A4 for the regression results.

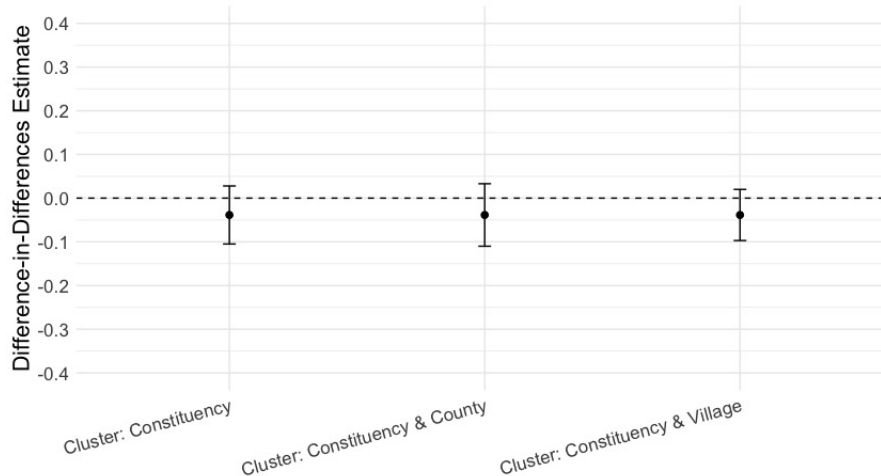


Figure 8: Placebo Test: Reform Assigned to 2004

5 Evidence from the Survey Data

Although previous results suggest a shift in strategic voting following the reform, the underlying mechanisms driving this change remain unclear. Individual-level survey data offer valuable insights into this question. The Taiwan Election and Democratization Study (TEDS) has surveyed voters in every local and national election since 2000, collecting extensive information on voting behavior and political attitudes. This section draws on data from the [Taiwan Election and Democratization Study \(TEDS\) \(2004, 2008\)](#).¹⁶

The surveys include questions on respondents' party identification and their actual voting choices.¹⁷ Respondents are also asked whether they support any particular political party.¹⁸ By combining these questions, it is possible to identify strategic voters, defined as individuals who report supporting one party but voting for a candidate from another party in the SMD tier.

Table 5 presents the results from the 2004 and 2008 surveys. A comparison of the

¹⁶ For 2004, I use the samples from TEDS2004L(A) Independence and TEDS2004L(B) Independence. For 2008, I use the sample from TEDS2008L Independence.

¹⁷ Specifically, VN18B in TEDS2004L(A), VL2B in TEDS2004L(B), and S01B in TEDS2008L.

¹⁸ VL8A in TEDS2004L(A), VQ1B in TEDS2004L(B), and M01B in TEDS2008L.

proportion of respondents engaging in strategic voting reveals a modest decline following the electoral reform: 23% of respondents reported voting strategically in 2004, compared to 20% in 2008. However, a closer examination of party identification suggests that this decline is primarily driven by changes in partisan alignment. Prior to the reform, 82% of respondents identified with one of the two major parties, and 18% supported minor parties. After the reform, support for the major parties rose to 95%, with only 5% of respondents continuing to identify as minor parties' supporters.

Importantly, the survey results indicate that supporters of minor parties are significantly more likely to engage in strategic voting. In 2004, 17% of major party supporters reported voting strategically, compared to 48% of minor party supporters. This pattern is even more pronounced in 2008, when 15% of major party supporters voted strategically, whereas all minor party supporters (100%) did so.

In summary, the survey evidence supports the earlier findings. The electoral reform appears to have incentivized more strategic voting behavior. A substantial share of minor party supporters shift their identification to major parties, whereas those who retain their original identification overwhelmingly cast votes for major party candidates.

Table 5: Strategic Voting among Different Party Supporters

Election	2004 Parliamentary		2008 Parliamentary		
	Group	# of Respondents (% of total)	% of Strategic Voters	# of Respondents (% of total)	% of Strategic Voters
	Major Party Supporters	985 (82%)	17%	511 (95%)	15%
	Small Party Supporters	218 (18%)	48%	29 (5%)	100%
	Total	1203 (100%)	23%	540 (100%)	20%

The results of a logistic regression analysis further confirm the robustness of this finding. Table 6 presents models estimating the likelihood that individuals engage in strategic voting. The dependent variable is a binary indicator coded as 1 if a respondent engages in strategic voting and 0 otherwise. The key independent variables are KMT

and DPP, which are dummy variables identifying supporters of the two major parties respectively.¹⁹

Across all model specifications, party identification remains a statistically significant predictor of strategic voting, indicating its central role in shaping voter behavior. The negative coefficients for KMT and DPP suggest that major party supporters are significantly less likely to vote strategically. This result is consistent with expectations because candidates from major parties are more likely to be perceived as viable contenders. In contrast, supporters of less competitive candidates, often from minor parties, may have stronger incentives to vote tactically.

¹⁹ Gender is coded as a binary variable, where male = 1 and female = 0. Age is a categorical variable with five groups: 20–29 = 1, 30–39 = 2, 40–49 = 3, 50–59 = 4, and 60 and above = 5. Education is also categorical: primary school = 1, junior high = 2, senior high = 3, junior college = 4, and college or above = 5.

Table 6: Predictors of Strategic Voting: Logistic Regression Results

	<i>Whether the respondent votes strategically or not</i>		
	All	2004	2008
KMT	−2.186*** (0.156)	−1.788*** (0.180)	−20.359*** (0.206)
DPP	−2.798*** (0.179)	−2.502*** (0.198)	−20.850*** (0.312)
Gender	−0.244 (0.134)	−0.224 (0.157)	−0.421 (0.282)
Age	−0.103 (0.061)	−0.026 (0.069)	−0.336* (0.143)
Education	−0.071 (0.058)	−0.010 (0.065)	−0.264 (0.141)
Constant	1.180*** (0.369)	0.458 (0.410)	20.604*** (0.852)
Observations	1,743	1,203	540
Log Likelihood	−744.113	−538.704	−177.591

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Coefficients are log odds ratios. The reference group for party identification consists of respondents who do not identify with KMT or DPP (including minor party supporters and independents). The large magnitude of the 2008 coefficients for KMT and DPP reflects a near-complete separation problem. In the 2008 sample, all minor party supporters voted strategically (Table 5), leaving very few observations in the reference group that did not vote strategically. This causes the logit coefficients to be estimated with high uncertainty, as reflected in the large standard errors.

6 Conclusion

This study shows that electoral institutions can directly affect strategic voting. Using Taiwan’s 2008 parliamentary reform and local council elections as a comparison, the analysis finds that strategic voting increased after parliamentary districts were reduced to single-member seats. The decline in the SF ratio is larger in districts that experienced more seat reductions. The effect is also stronger in districts that were more competitive before the reform and in areas where minor parties had previously been present. This

shift is already visible in the first election after the reform, suggesting that voters adjusted to the new electoral incentives relatively quickly.

These findings refine existing accounts of strategic voting by demonstrating that magnitude effects are not confined to parliamentary systems where legislative outcomes determine executive control. Even when executive formation incentives are partially decoupled from legislative competition, voters respond to changes in district magnitude in systematic ways. That these patterns emerge in a semi-presidential system, where legislative elections do not directly determine executive survival, suggests that strategic voting pressures are more structurally embedded in electoral competition than existing accounts have recognized.

Despite certain inferential challenges, the core findings remain robust. One concern is that the reform introduced several simultaneous changes, including the adoption of a separate PR ballot, which in some cases encouraged coordination between major and minor parties. Moreover, the revised electoral rules may have influenced party nomination strategies. To address these concerns, a series of robustness checks are conducted. The results indicate that the decline in the SF ratio persists even in districts where small parties continued to nominate candidates, and the observed patterns are not explained by changes in candidate supply. The finding that larger seat reductions produce stronger declines in the SF ratio is also inconsistent with a uniform PR ballot effect, which would be expected to affect all constituencies equally regardless of the extent of seat reduction. Overall, the observed decline in the SF ratio appears to be primarily driven by shifts in voter behavior rather than by changes in the party system or candidate supply.

The survey results are consistent with the patterns observed in the electoral data, and provide direct evidence of voter-level behavioral adjustment. Most strategic voters

are individuals who initially supported minor parties. Following the electoral reform, a significant portion of these voters shifted their party identification, now expressing support for major parties and voting accordingly. Among those who continued to identify with minor parties, most still cast their votes for candidates from major parties. This helps explain why candidates from outside the two dominant parties received relatively few votes and why SF ratios declined substantially after the reform.

The survey findings also speak to a broader pattern. Taiwan was still in the early stages of democratic consolidation in 2004 and 2008, with a fluid party system and frequent formation of new parties. Previous studies suggest that voters in newer democracies may require more time to identify viable candidates and act strategically (Moser & Scheiner, 2009). Yet Taiwan appears to be an exception, as voters adapted quickly to the new electoral rules, concentrating their support on major-party candidates almost immediately after the reform. A substantial share of minor party supporters not only voted strategically but shifted their party identification entirely. This rapid consolidation toward a two-party configuration suggests that institutional design can accelerate party system development even in newer democracies, compressing a process that elsewhere unfolds over many electoral cycles. Future research might examine whether similar patterns of rapid partisan realignment emerge in other newer democracies that have undergone comparable magnitude reductions, and whether the speed of consolidation varies with the degree of institutional change or the prior level of party system institutionalization.

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Appendix

Table A1: Timeline of Elections Relative to the Reform

Year	Election Type	Election Wave	Group
1998	Parliamentary	Pre 3	Treatment
1998	Local council	Pre 3	Control
2001	Parliamentary	Pre 2	Treatment
2002	Local council	Pre 2	Control
2004	Parliamentary	Pre 1	Treatment
2005*	Local council	Pre 1	Control
2008	Parliamentary	Post 1	Treatment
2009*	Local council	Post 1	Control
2012	Parliamentary	Post 2	Treatment
2014	Local council	Post 2	Control
2016	Parliamentary	Post 3	Treatment
2018	Local council	Post 3	Control

Notes: Given that local elections in 2006 were held only in Taipei and Kaohsiung, and those in 2010 only in Taipei, Kaohsiung, New Taipei, Tainan, and Taichung, I recode these elections as part of the 2005 and 2009 local election cycles to maintain consistency in the research design.

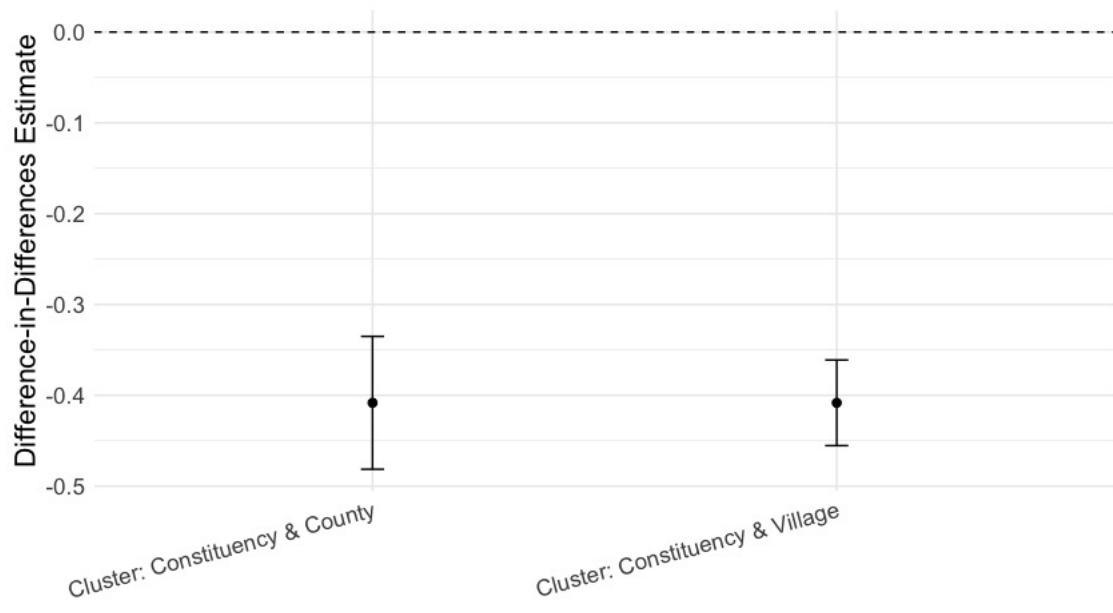


Figure A1: Main DiD Estimates with Two-Way Clustering

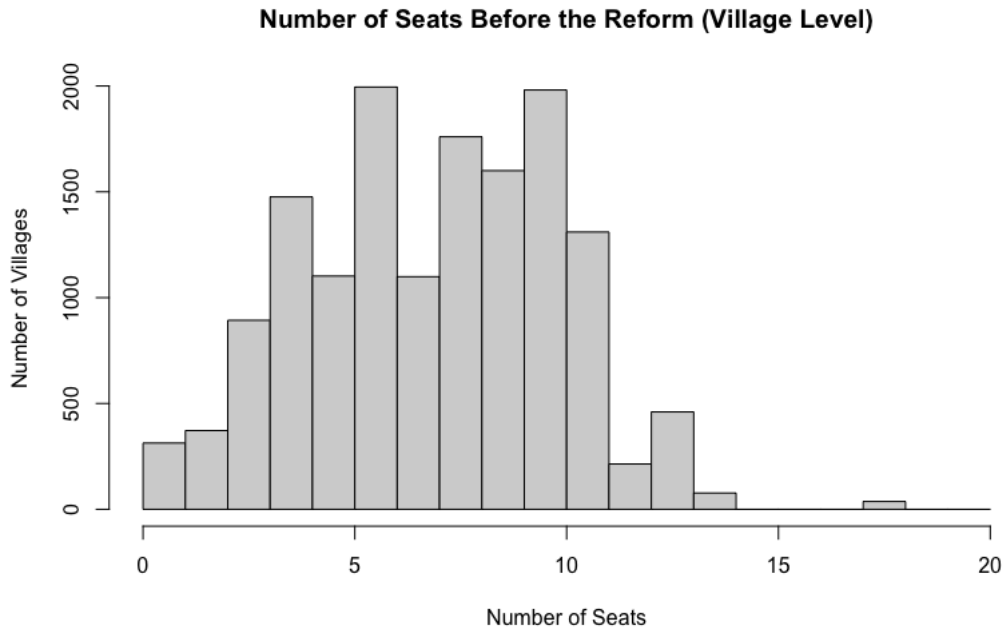


Figure A2: Number of Seats in Parliamentary and Local Elections Before the Reform

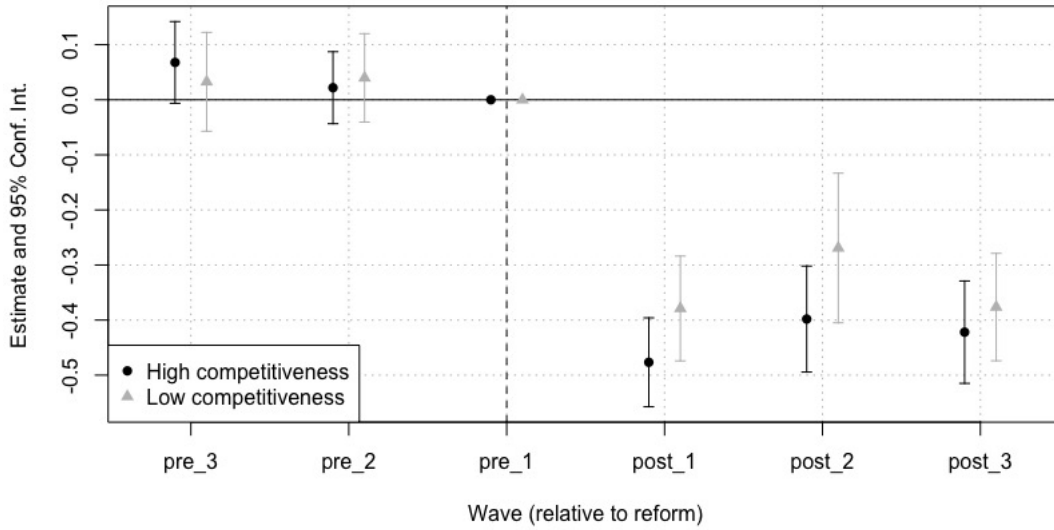


Figure A3: Pre-trend Tests for Heterogeneous Effects by Pre-Reform Electoral Competitiveness

Notes: The figure plots difference-in-differences estimates for each wave relative to the reform, with pre_1 as the baseline. High competitiveness denotes villages where the pre-reform KMT–DPP vote-share gap falls below the median; low competitiveness denotes villages at or above the median. 95% confidence intervals based on standard errors clustered by constituency.

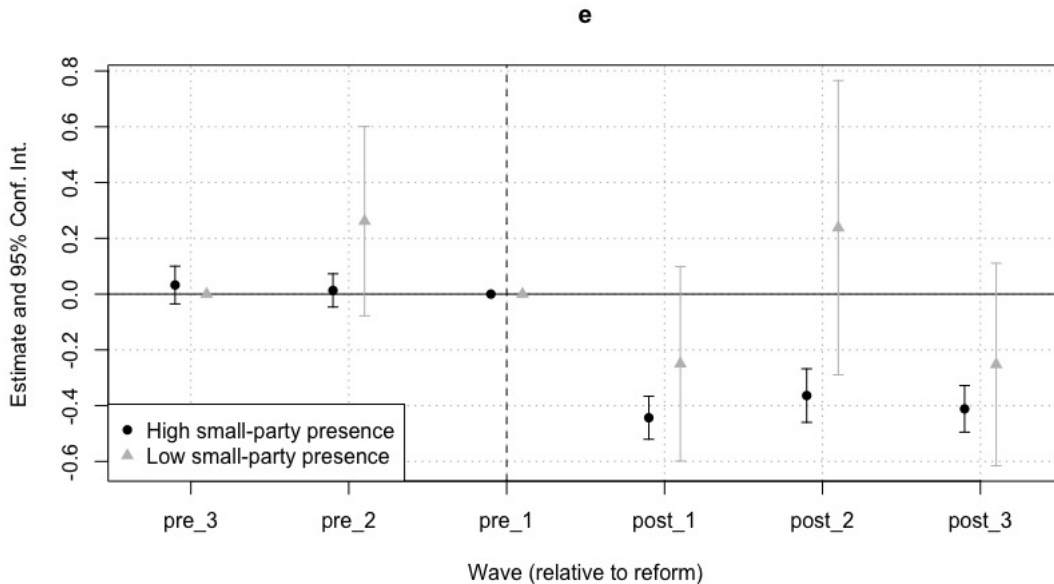


Figure A4: Pre-trend Tests for Heterogeneous Effects by Pre-Reform Small-Party Presence

Notes: The figure plots difference-in-differences estimates for each wave relative to the reform, with pre_1 as the baseline. High small-party presence denotes villages where at least one small-party candidate won a seat prior to the reform; low small-party presence denotes villages with no such representation. 95% confidence intervals based on standard errors clustered by constituency.

Table A2: Heterogeneous Effects by Pre-Reform Electoral Conditions

	<i>Dependent Variable: SF Ratio</i>	
	(1)	(2)
Treatment (Parliamentary)	0.026 (0.025)	0.014 (0.033)
Post \times Parliamentary	-0.512*** (0.038)	-0.289*** (0.048)
Treatment \times Pre-Reform Electoral Competitiveness	-0.021 (0.105)	
Post \times Pre-Reform Electoral Competitiveness	0.121 (0.070)	
DiD \times Pre-Reform Electoral Competitiveness	0.556*** (0.132)	
Treatment \times Pre-Reform Small-Party Presence		0.007 (0.021)
Post \times Pre-Reform Small-Party Presence		0.005 (0.015)
DiD \times Pre-Reform Small-Party Presence		-0.094** (0.030)
Village FE	YES	YES
Election Cycle FE	YES	YES
Observations	75,347	75,347
R ²	0.485	0.487
Within R ²	0.276	0.279

*p<0.05; **p<0.01; ***p<0.001. Robust standard errors are in parentheses and clustered by constituency. The post-reform indicator and time-invariant baseline variables (Pre-Reform Electoral Competitiveness and Pre-Reform Small-Party Presence) are absorbed by village and election-cycle fixed effects and therefore omitted due to collinearity.

Table A3: Difference-in-Differences Results with Pre-Reform Controls and Subsamples

	<i>Dependent Variable: SF Ratio</i>		
	(1) Full sample	(2) TSU/PFP nomination	(3) All Small-party nomination
	w/ Pre-Reform Controls	w/ Pre-Reform Controls	w/ Pre-Reform Controls
Treatment (Parliamentary)	0.021 (0.016)	-0.054 (0.069)	-0.027 (0.025)
Post × Parliamentary	-0.408*** (0.026)	-0.309*** (0.071)	-0.345*** (0.049)
Village FE	YES	YES	YES
Election Cycle FE	YES	YES	YES
Observations	75,347	14,735	38,403
R ²	0.478	0.489	0.535
Within R ²	0.267	0.127	0.172

*p<0.05; **p<0.01; ***p<0.001. Standard errors are in parentheses and clustered by constituency. Column (1) reports the baseline difference-in-differences specification. Column (2) restricts the sample to constituencies in which TSU/PFP nomination status is fixed before and after the reform. Column (3) restricts the sample to constituencies in which overall small-party nomination status is fixed before and after the reform. The post-reform indicator and time-invariant baseline variables (Pre-Reform Electoral Competitiveness and Pre-Reform Small-Party Presence) are absorbed by village and election-cycle fixed effects and therefore omitted due to collinearity.

Table A4: Additional Check for PR Ballot Effect

	<i>Dependent Variable: SF Ratio</i>	
	Magnitude-Reduced vs. Unchanged	Unchanged Constituencies
Post × Seat Reduced or not	-0.388*** (0.050)	
Post		-0.028 (0.020)
Village FE	YES	YES
Election Cycle FE	YES	NO
Observations	41,339	2,392
R ²	0.669	0.251
Within R ²	0.028	0.002

*p<0.05; **p<0.01; ***p<0.001. Robust standard errors are in parentheses and clustered by constituency. Both specifications include only parliamentary elections.

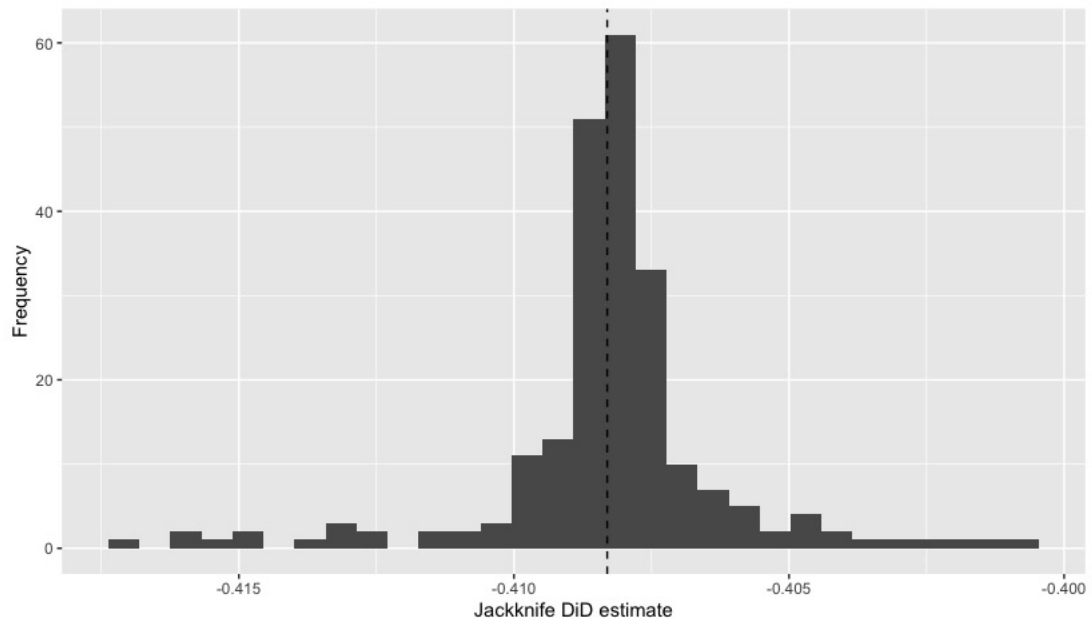


Figure A5: Results of Panel Jackknife Regressions

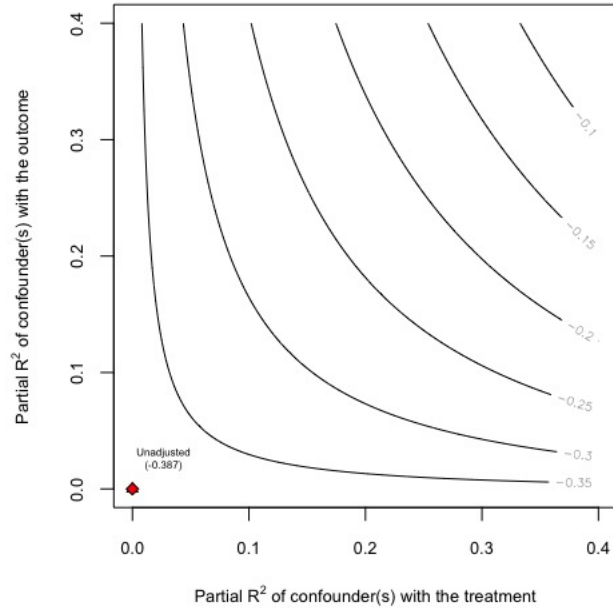


Figure A6: Sensitivity to Omitted Variable Bias: Benchmarking Against Pre-Reform Electoral Competitiveness

Notes: This figure reports an omitted variable bias contour plot from the sensitivity analysis. The plot benchmarks robustness against pre-reform electoral competitiveness, defined as the average pre-reform KMT–DPP vote-share gap at the village level (averaged across pre-reform elections). Both the treatment interaction and the outcome are residualized with respect to district fixed effects. The benchmark covariate lies close to the origin, implying that an unobserved confounder would need to be substantially stronger than pre-reform competitiveness to overturn the estimated DiD effect.