Do Institutions Cause Strategic Voting?

Evidence from Taiwan

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Abstract

Existing research shows that institutions shape strategic voting, yet most evidence comes from parliamentary democracies. Other types of democracies remain less explored. This study investigates the causal impact of institutional change on strategic voting in Taiwan, a semi-presidential democracy, using a within-country research design. In 2008, Taiwan shifted from a multi-member to a single-member district system for parliamentary elections, while the rules for local council elections remained unchanged. Leveraging this institutional change, I implement a difference-in-differences framework, supplemented by individual-level survey evidence to assess strategic voting under different electoral rules. The results reveal a significant rise in strategic voting following the reform, particularly in districts that experienced larger seat reductions. Survey data further indicate that supporters of minor parties were especially likely to vote strategically or change their party identification. These behavioral shifts appear to be driven primarily by voters rather than by parties, suggesting that individuals responded quickly and adaptively to the new electoral incentives.

Keywords: Institutions, Strategic Voting, Electoral Reform, Difference in Differences

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1 Introduction

Electoral rules are often discussed as shaping voter behavior. A classic argument, associated with Duverger (1954) and later formalized by Cox (1997), suggests that smaller district magnitudes create stronger incentives for strategic voting. When only one seat is available, supporting a trailing candidate carries greater risk, which can prompt voters to shift toward more competitive contenders.

Most of the empirical evidence for this claim comes from parliamentary systems (Moser & Scheiner, 2009). In those settings, legislative elections determine who forms the government, and seat shares translate directly into executive authority. The consequences of legislative outcomes are therefore relatively clear. Semi-presidential systems differ in that presidents and legislatures are elected separately, and executive power does not depend exclusively on legislative seat distribution (Samuels & Shugart, 2010). Legislative contests may thus have less direct implications for government formation.

This institutional structure complicates expectations about strategic voting in legislative elections. When control of the executive does not hinge directly on legislative seat shares, voters may perceive weaker incentives to abandon trailing candidates. At the same time, presidential elections often attract greater public attention and can clarify which parties are electorally viable. Research shows that presidential dynamics may shape legislative competition, particularly when the two elections occur within the same electoral cycle (Stoll, 2015; Clark & Golder, 2006; Rich, 2018). Repeated two-party presidential races may reinforce perceptions that only major-party candidates are competitive, and these perceptions can extend to concurrent legislative contests.

Taiwan's 2008 reform provides an opportunity to evaluate this argument. The reform replaced multi-member districts elected under single nontransferable vote with single-

member districts while leaving the broader institutional framework intact. This allows observation of how voters respond to a sharp reduction in district magnitude without a concurrent change in regime type or party structure. Strategic voting is measured using the second-to-first loser ratio, a constituency-level indicator of vote concentration among trailing candidates. The analysis therefore assesses whether magnitude reduction alone is sufficient to alter voter behavior in this context.

To identify the effect of magnitude reduction, I compare parliamentary elections to local council elections, whose electoral rules remained unchanged from 1998 to 2018.[1] Using village-level data and a difference-in-differences design, I assess whether vote concentration consistent with strategic voting increased after the reform in parliamentary contests relative to the local baseline. This comparison helps separate the effect of institutional change from broader shifts in political competition or voter preferences.

The results show that strategic voting rose in parliamentary elections following the reform, relative to local council contests. The increase is largest in districts that experienced more substantial seat reductions and in areas that were electorally competitive before the reform. These patterns are consistent with the mechanism: when the number of available seats contracts sharply, the cost of supporting trailing candidates rises, strengthening incentives to converge on viable options. At the same time, the evidence does not support a purely party-driven explanation. Changes in candidate entry and nomination patterns do not account for the observed shift in vote concentration, and survey evidence indicates that supporters of smaller parties became more likely to back viable candidates after the reform. Together, these findings point to voter-level strategic adjustment rather than

[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 similar functions, primarily overseeing local governments.

solely elite coordination.

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 evaluates a central implication of strategic theory by examining whether larger reductions in magnitude generate stronger strategic responses. Third, by distinguishing voter-level behavior from party-level entry decisions, it clarifies the mechanism through which institutional change affects electoral outcomes. The evidence shows that district magnitude shapes strategic voting even in a semi-presidential system where legislative elections do not determine executive survival, suggesting that strategic voting pressures stem from the structure of electoral competition itself rather than solely from government formation stakes.

2 Theoretical Framework

2.1 District Magnitude and Strategic Voting Incentives

Why do voters sometimes turn away from the candidate they genuinely prefer? A common explanation is that voting is not purely expressive. As Aldrich et al. (2018) suggests, voters often think in instrumental terms and care about outcomes, not just statements of preference. If supporting a weaker candidate increases the chances of an even less desirable result, some voters will reconsider their choice. Under those conditions, backing a stronger contender can appear pragmatic rather than insincere.

These incentives are shaped by the structure of electoral competition. 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 single-member plurality elections in Britain with multi-member contests in Japan, where strategic voting appear stronger in the single-member setting. 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 therefore confront a trade-off between loyalty and strategic adjustment. Related arguments concerning pivotal voting and strategic behavior appear in earlier theoretical work (Palfrey, 1989; Myerson & Weber, 1993).

Still, it is not entirely clear how much of this dynamic can be attributed directly 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 institutional dimensions. Electoral rules, party systems, and political contexts often vary simultaneously, making it difficult to isolate the independent behavioral effect of magnitude alone. Observed vote concentration may therefore reflect broader institutional differences rather than incentives generated specifically by seat reduction.

This identification challenge is compounded by the fact that electoral reforms can produce both mechanical and psychological effects (Fiva & Folke, 2016). Mechanical effects stem from how seats are distributed once electoral rules change, whereas psychological effects arise from behavioral responses by voters and parties. Although related, these channels are analytically distinct and need not move in the same direction.

When district magnitude is reduced, some shifts in electoral outcomes may simply

reflect arithmetic redistribution of seats. At the same time, reform may alter expectations about competition, particularly which candidates are perceived as viable. If magnitude shapes strategic voting incentives, then we should observe changes in desertion behavior rather than merely altered seat totals. The key question, therefore, is whether magnitude reduction generates a behavioral response at the voter level.

A within-country reform offers a cleaner setting to evaluate this distinction. If district magnitude changes while most other institutional features remain broadly stable, it becomes possible to observe whether voters adjust their behavior under the new constraints. If strategic voting incentives arise from magnitude itself, reducing the number of seats should be accompanied by an increase in strategic voting.

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

2.2 Seat Reduction and the Intensity of 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 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 therefore 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 frontrunners, they have less reason to abandon their preferred candidates. As Heath & Ziegfeld (2022) note in the Indian case, limited polling information can dampen strategic voting even when elections are competitive. Institutional incentives, by themselves, may not be enough if voters lack credible signals about viability.

District magnitude influences not only incentives but also how transparent the race appears. When the number of seats falls, the bar for remaining competitive rises, and the field tends to narrow. In cases of substantial magnitude reduction, the structure of competition may become easier to read: fewer candidates look realistically viable, and the gap between leading and trailing contenders is more visible. Smaller reductions, however, might not clarify matters to the same extent. The competitive environment could remain somewhat uncertain.

If strategic voting is shaped by these competitive constraints, then we should expect behavioral responses to differ depending on how dramatic the institutional change is. Larger seat contractions are likely to generate stronger shifts in strategic voting, whereas modest changes may produce only limited adjustment. This expectation suggests a second implication.

Hypothesis 2 (Intensity of Reduction). *The increase in strategic voting is larger in constituencies that experience greater reductions in seats.*

2.3 Constituency Competitiveness and Strategic Voting

Strategic voting presupposes uncertainty. Where one candidate dominates overwhelmingly, the incentive to vote strategically is limited because the outcome is largely predetermined. By contrast, in closely contested races voters face greater uncertainty about which candidates are viable and therefore stronger incentives to coordinate (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 district magnitude changes. In constituencies 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 magnitude is reduced to a single seat, the consequences of backing a trailing candidate become more consequential, since only one contender can be elected. In closely contested districts, the perceived cost of casting a vote for a nonviable candidate is therefore 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 could still yield representation. After the transition to single-member districts, that 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 received substantial vote shares.*

2.4 Voter versus Party Mechanisms

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 likewise finds that nomination strategies often evolve after reforms (Moser & Scheiner, 2009; Stoll, 2015).

Because of this, greater vote concentration after reform does not automatically imply that voters are deserting their preferred candidates. It could simply reflect fewer candidates competing in the first place. If parties narrow the field, voters may appear more coordinated even if their underlying behavior has not changed very much. In that scenario, what looks like strategic voting would actually stem from supply-side adaptation.

Therefore, separating voter responses from party-level adjustment 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 adjustment. 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. I therefore 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. If strategic voting is primarily voter-driven, the increase in SV should persist in these districts.

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 vote 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.

3 Research Design

3.1 Background of the 2008 Electoral Reform

In 2008, Taiwan underwent a reform of 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. As a result, 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 seats (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 seats were allocated through a nationwide party-list proportional representation (PR) tier.[2]

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. Table 1 provides a simplified illustration of this pre-reform electoral arrangement.

Table 1: Examples For Electoral Rules Before the Reform

Constituency (Voters only vote for candidate)	Ballot (Votes for each candidate)	Results
1 (2 seats)	Candidate A (Party X)*10 Candidate B (Party Y)*9 Candidate C (Party Z)*8 Candidate D (Party X)*7	Candidate A & B win district seats in 1 Candidate G & H win district seats in 2 Party X gets 24 votes in PR Party Y gets 27 votes in PR Party Z gets 17 votes in PR ⇒ Party Y wins the only seat in PR
2 (2 seats)	Candidate E (Party X)*7 Candidate F (Party Y)*8 Candidate G (Party Z)*9 Candidate H (Party Y)*10	

After the reform, several institutional changes were implemented. First, the total

[2] 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.

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 (SMDs), 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 proportional representation (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.[3] Table 2 compares the pre- and post-reform electoral rules.

Table 2: 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 at the same time, 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 examines these components separately. In particular, it considers the reduction in district magnitude, possible adjustments in party nomination strategies, and the intro-

[3] 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.

duction 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

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

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, as support among trailing candidates concentrates on the most competitive loser.

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 therefore 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 below, aggregate patterns at the constituency level closely 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 therefore constitute the treatment group, and local council elections serve as the control.[4]

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:

$$SFRatio_{ivt} = \beta_0 + \beta_1 Parl_i + \beta_2 Post_t + \beta_{DD}(Parl_i \times Post_t) + \alpha_v + \gamma_t + \epsilon_{ivt}$$

where α_v denotes village fixed effects and γ_t denotes election-year fixed effects. The

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

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:

$$SFRatio_{ivt} = \beta_0 + \beta_1 Parl_i + \beta_2 Post_t + \beta_{DD}(Parl_i \times Post_t \times ReducedSeats_i) + \alpha_v + \gamma_t + \epsilon_{ivt}$$

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 district and election year. 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 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 1 shows that pre-reform trends in the SF ratio are closely aligned across parliamentary and local elections.[5]

[5] For parliamentary elections (treatment), pre_3, pre_2, and pre_1 correspond to 1998, 2002, 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, 2006, 2010, 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 (primarily Taipei and Kaohsiung), I harmonize election timing by grouping the 2005 and 2006 elections as 2006, and the 2009 and 2010 elections as 2010.

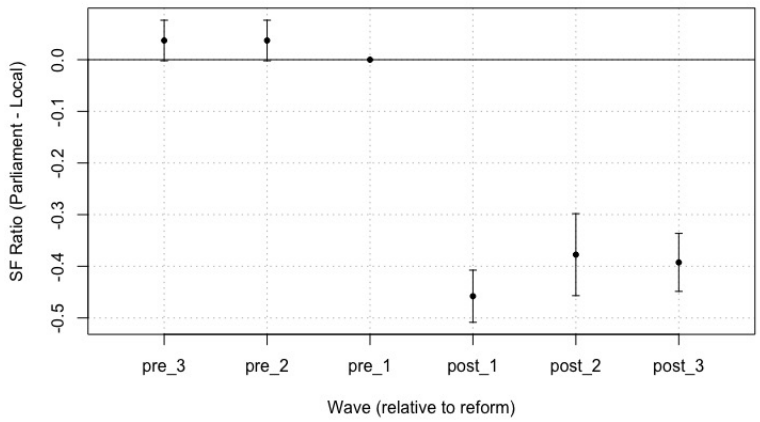


Figure 1: Dynamic treatment effects with leads and lags

4 Empirical Results

4.1 Main Results

Figure 1 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 desertion are limited. The near parity between the two leading 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.

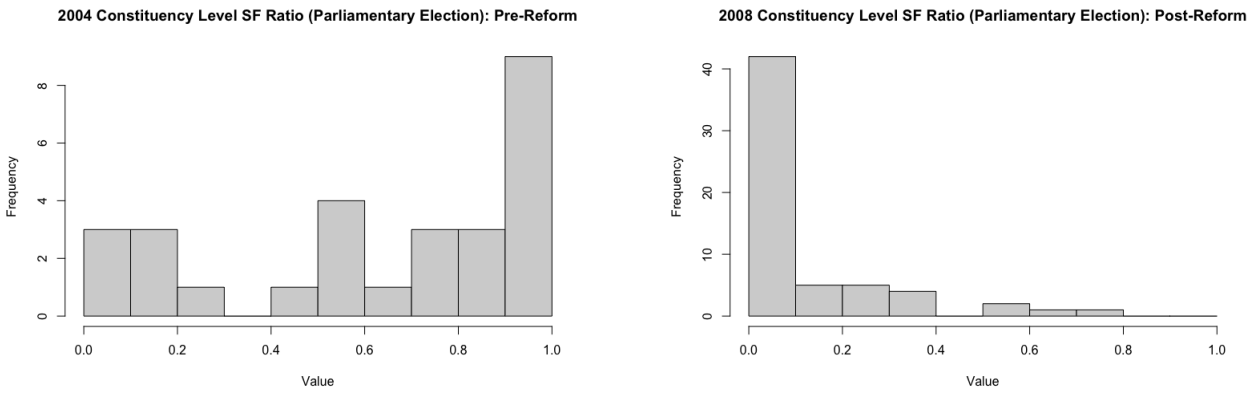


Figure 2: Constituency Level SF Ratio (Parliamentary Election)

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.[6] Instead of splitting into two distinct groups of districts, the distribution in each year is organized around a single main 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

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

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 ten years.[7]

As previously stated, the size of the constituencies has undergone a transformation as a consequence of the reform. In order to ascertain the impact of electoral reform on voting behavior, it is essential to undertake a comparative analysis of the behavior of the same groups of individuals both before and after the reform. By conducting the comparison at the village level, it is possible to reduce the impact of other variables because the remaining conditions should be largely similar. As the village represents the smallest unit of analysis in the context of constituency redrawing, examining the SF ratio at the village level can assist in elucidating the behavioral shifts occurring within a homogeneous population. Figure 2 presents the SF ratios at the village level.

[7] 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.

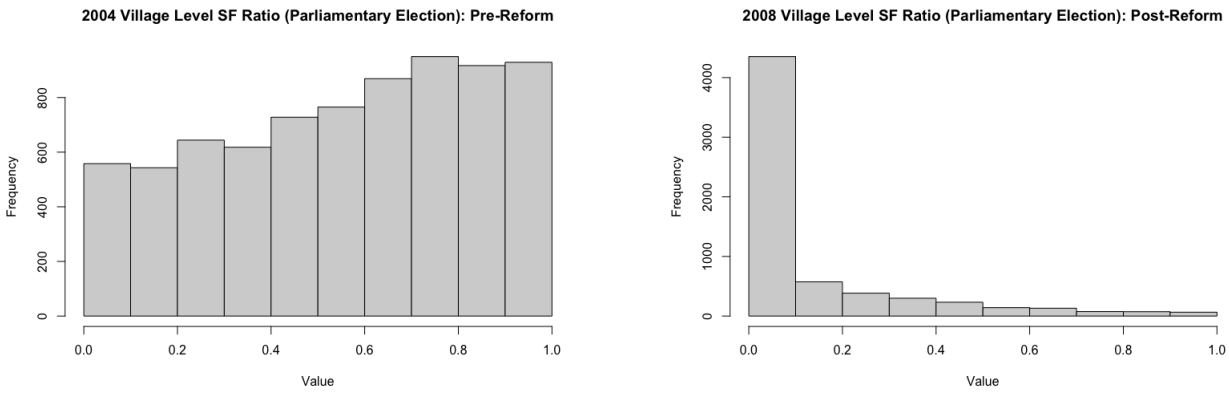


Figure 3: Village Level SF Ratio (Parliamentary Election)

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. One potential 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 3 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.

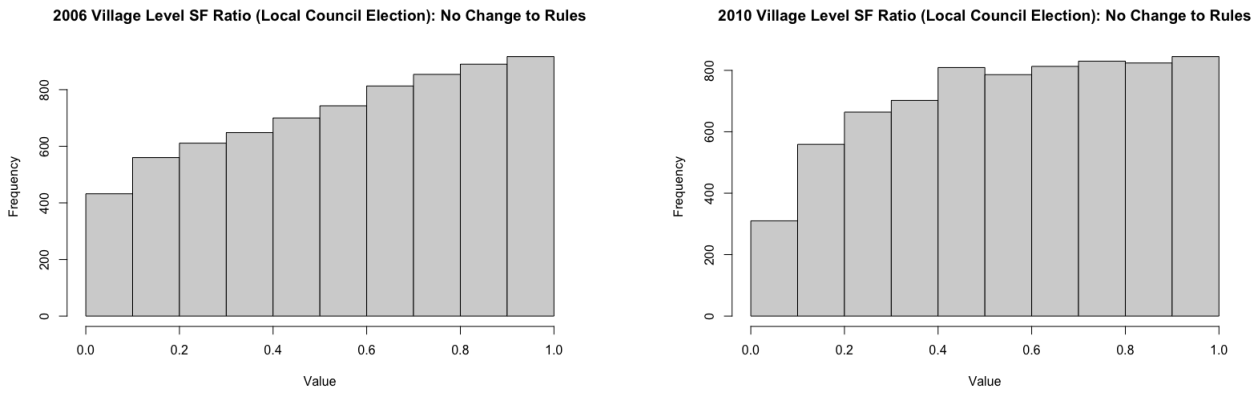


Figure 4: Village Level SF Ratio (Local Council Election)

Table 3 reports the difference-in-differences estimates using data from two parliamentary elections and local elections observed before and after the reform. In Model 1, the DID coefficients are negative and statistically significant. 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 examines whether the magnitude of seat reduction matters. The interaction term remains negative and significant. On average, reducing one seat in a district corresponds to a decline of about 0.014 in the SF ratio 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.

Information likely plays a role. Before reform, many constituencies, both parliamentary and local, had more than five seats, accounting for roughly 60 percent of observa-

tions.[8] In such settings, identifying likely winners is not straightforward. When signals are unclear, voters have less reason to abandon preferred candidates. After 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.

Table 3: Main Difference-in-Differences Results

	Dependent Variable: SF Ratio	
	(1)	(2)
Difference in Difference	-0.408^{***}	-0.330^{***}
	(0.026)	(0.039)
DiD × 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

*p<0.05; **p<0.01; ***p<0.001. Robust standard errors are in parentheses and clustered by constituency.

The post-reform decline in the SF ratio is substantial. Under the previous multi-member system, smaller parties were often able to win seats, and it would not have been unreasonable to expect some of that pattern to continue after the transition to single-member districts.[9] The estimates point in a different direction. Votes became more concentrated on the top two candidates once district magnitude was reduced. This raises a practical question: how do voters determine which candidates are viable in single-member races? As noted earlier, semi-presidential systems do not send entirely clear signals. Legislative outcomes are not directly tied to executive control, but presidential elections may

[8] See Figure A1 in the appendix.

[9] 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).

shape perceptions of party strength. In Taiwan, presidential contests are widely seen as the most important elections and often frame broader party competition. Prior research finds measurable presidential coattail effects under Taiwan's mixed-member system (Rich, 2018), indicating that presidential campaigns influence expectations in concurrent legislative races.

To explore which types of constituencies are more likely to exhibit strategic voting, I focus on two features of the pre-reform electoral context. The first is electoral competitiveness, captured by the pre-reform vote-share gap between the KMT and the DPP. Smaller gaps imply closer races and less certainty about the outcome. 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, 2002, and 2004). Together, they help distinguish places where strategic voting would plausibly matter from those where it would not.

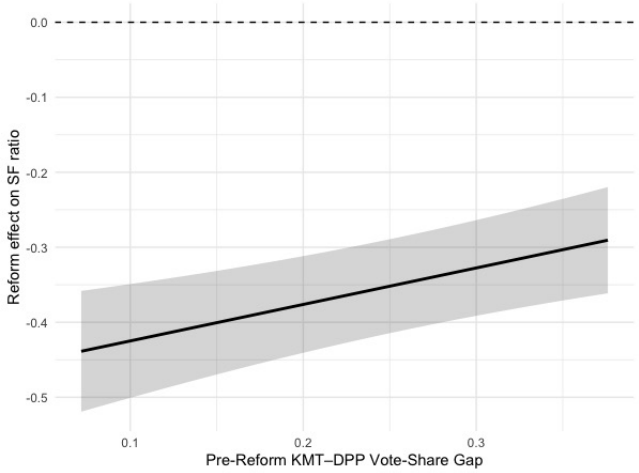
Figure 5 examines how the reform-related decline in the SF ratio varies across these environments. The estimates come from difference-in-differences regressions that interact the reform indicator with pre-reform village characteristics and include district fixed effects.[10] The reduction in the SF ratio 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 wide margins, the estimated reform effect is noticeably 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 that had previously elected minor-party candidates exhibit a stronger post-reform decline in the SF ratio. In contrast, in villages long dominated by a single major party, the estimated

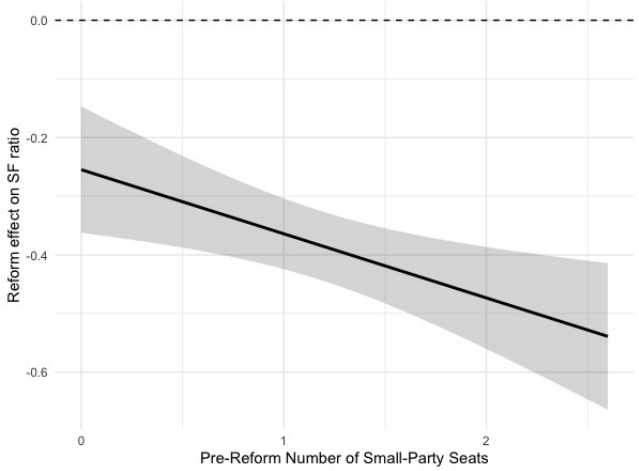
[10] Appendix Table A2 reports the full regression results underlying Figure 5.

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 points in the same direction. Strategic voting is most visible in places where competition was close and alternatives had previously existed. 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.



Panel A. Reform Effects by Pre-Reform Electoral Competitiveness



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

Figure 5: Heterogeneous Reform Effects on the SF Ratio

4.2 Alternative Explanations and Robustness Checks

Given the multiple institutional changes encompassed by the reform, it is important to assess whether the observed decline in the SF ratio could be driven by factors other than voter responses to altered electoral incentives. One plausible 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.[11]

To assess whether changes in party coordination account for the reform effect, I examine whether the decline in the SF ratio persists when nomination strategies are held constant. Figure 6 reports difference-in-differences estimates for subsamples of districts

[11] 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).

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. In both cases, the reform effect remains negative and statistically significant, with magnitudes comparable to the full-sample estimates. In particular, in districts where small parties continued to nominate candidates—indicating the absence of formal electoral coordination—the decline in vote fragmentation relative to the pre-reform period persists. Although vote concentration is somewhat lower in these districts compared to coordinated ones, the structural shift following magnitude reduction remains evident. These findings suggest that while party coordination influences electoral outcomes at the margin, it is not sufficient to account for the observed decline in the SF ratio. Instead, the evidence is consistent with magnitude-induced strategic voting operating at the voter level.

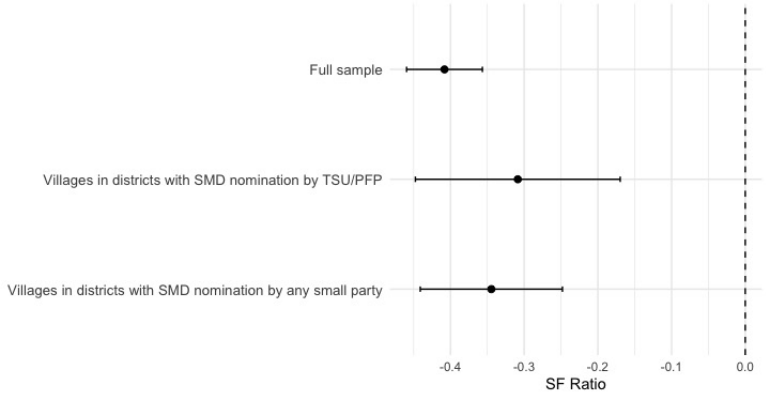


Figure 6: Reform effects on the SF ratio across nomination subsamples

An alternative explanation is that the reform discouraged small-party entry, thereby reducing effective competition in SMD contests. In other words, other smaller parties may be inclined to nominate a smaller number of candidates in accordance with the new electoral rules. Accordingly, an examination of the number of candidates is warranted to assess the validity of this alternative hypothesis.

Table 4 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 4: 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%)

Moreover, the same difference-in-difference estimation is utilized to determine whether nomination patterns undergo a change following the electoral rules reform. Given that the total number of seats has been reduced by half, the relative number of candidates provides a more accurate reflection of the change in nomination patterns. Accordingly, the ratio of candidates to seats is employed as the dependent variable.

The results reported in Table 5 show that political parties did not withdraw from the electoral process following the reform. On the contrary, parties continued to nominate more candidates in the post-reform period. Importantly, the difference-in-differences esti-

mate is positive, and the interaction between the post-reform indicator and the reduction in district magnitude is not negative. These results indicate that parties did not strategically scale back their nomination efforts in response to seat reductions. The evidence suggests that the persistence of voter concentration on the two major parties cannot be attributed to strategic adjustments in party nomination behavior. Despite the expanded set of candidates on the ballot, voters continued to favor the two major parties. This pattern implies that the observed strategic voting is more plausibly driven by individual voter behavior rather than by party-level strategic retreat.

Table 5: Party Nomination Strategy

	Dependent Variable: Number of Candidates Per Seat	
	(1)	(2)
Difference in Difference	2.303***	2.163***
	(0.142)	(0.280)
DiD × 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

*p<0.05; **p<0.01; ***p<0.001. Control variables include the pre-reform gap in vote share between the two major parties. Robust standard errors are in parentheses and clustered by constituency.

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 7 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 indistinguish-

able 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 A2 presents a leave-one-district-out jackknife analysis, showing that the estimated reform effect is not driven by any single district. Appendix Figure A3 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.

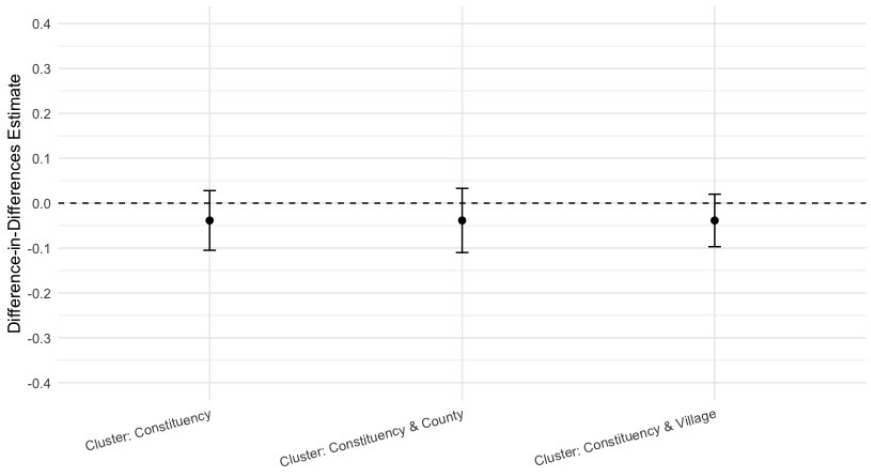


Figure 7: Placebo Test: Reform Assigned to 2004

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).[12]

The surveys include questions on respondents' party identification and their actual voting choices.[13] Respondents are also asked whether they support any particular political party.[14] By combining these questions, it is possible to identify strategic voters, defined as individuals who report supporting one party but vote for a candidate from another party in the SMD tier.

Table 6 presents the results from the 2004 and 2008 surveys. A comparison of the 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 point out 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 sum, the survey evidence supports the earlier findings: the electoral reform ap-

[12] For 2004, I use the samples from TEDS2004L(A) Independence and TEDS2004L(B) Independence. For 2008, I use the sample from TEDS2008L Independence.
[13] Specifically, VN18B in TEDS2004L(A), VL2B in TEDS2004L(B), and S01B in TEDS2008L.
[14] VL8A in TEDS2004L(A), VQ1B in TEDS2004L(B), and M01B in TEDS2008L.

pears 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 6: 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 7 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.[15]

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.

[15] 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 7: Who are more likely to be strategic voters?

	Whether the respondent votes strategically or not		
	All	2004	2008
KMT	−2.186***	−1.788***	−20.359***
	(0.156)	(0.180)	(0.206)
DPP	−2.798***	−2.502***	−20.850***
	(0.179)	(0.198)	(0.312)
Gender	−0.244	−0.224	−0.421
	(0.134)	(0.157)	(0.282)
Age	−0.103	−0.026	−0.336*
	(0.061)	(0.069)	(0.143)
Education	−0.071	−0.010	−0.264
	(0.058)	(0.065)	(0.141)
Constant	1.180***	0.458	20.604***
	(0.369)	(0.410)	(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 logs odd ratio. The reference group for party identification consists of respondents who do not identify with KMT or DPP (including minor party supporters and independents).

6 Conclusion

This study provides evidence of a causal relationship between institutional design and strategic voting. Exploiting that only the rules of parliamentary elections changed, and the rules for local council elections remained constant, a difference-in-differences framework is employed to estimate the impact of electoral reform on strategic behavior. The findings suggest that voters recognized and responded to the transition from a multi-member district (MMD) to a single-member district (SMD) system. Following the reform, the SF ratios declined, and this decline is more pronounced in constituencies that experienced a

greater reduction in seats. This pattern implies that strategic voting is less common in the MMD system, likely because voters find it harder to predict outcomes in Constituencies with many seats. Similarly, voters are less inclined to vote tactically in safe districts, where their vote is unlikely to influence the outcome. As a result, supporters of minor parties tend to vote sincerely under such conditions.

Despite certain inferential challenges, the core findings remain robust. One concern is that the reform introduced several changes simultaneously, including the adoption of a second ballot for proportional representation (PR), which in some cases encouraged coordination between major and minor parties. Moreover, the revised electoral rules may have influenced party nomination strategies, potentially limiting the emergence of new or independent candidates. To address these concerns, a series of robustness checks are conducted. The results indicate that new and independent candidates continue to contest SMD races, but voters overwhelmingly favored candidates from the two major parties. Although minor parties occasionally formed alliances with major parties, these coalitions did not materially affect the main results when the alliance effect is accounted for. Overall, the observed decline in the SF ratio appears to be primarily driven by shifts in voter behavior, rather than changes in the party system or candidate supply.

The survey results are consistent with the patterns observed in the electoral data. Most strategic voters are individuals who initially supported minor parties. Following the electoral reform, a significant portion of these voters shift their party identification, now expressing support for major parties and voting accordingly. Among those who continue 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 receive relatively few votes and why SF ratios declined substantially after the reform.

This shift in party identification may be partly attributed to the relatively short period since Taiwan's democratization. In 2004 and 2008, Taiwan was still in the early stages of democratic consolidation, with a proliferation of new parties entering the political arena. Given this fluid environment, voters were hesitant to develop stable partisan attachments. Although previous studies suggest that voters in newer democracies may require time to assess the viability of candidates and parties (Moser & Scheiner, 2009), the Taiwanese case appears to be an exception. The newly implemented electoral rules encouraged voters to support the most viable candidates, making it difficult for emerging parties to achieve lasting electoral success despite their frequent formation.

As a result, Taiwan's party system has gradually converged toward a stable two-party configuration in the aftermath of the reform. This raises broader questions about the institutional foundations of party system development. Although it is commonly assumed that newer democracies feature less institutionalized party systems than more established ones, Taiwan's experience suggests that institutional design can play a critical role in accelerating party system consolidation. Future research may benefit from exploring which combinations of institutional arrangements most effectively foster party system institutionalization in emerging democracies.

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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
2002	Parliamentary	Pre 2	Treatment
2002	Local council	Pre 2	Control
2004	Parliamentary	Pre 1	Treatment
2006	Local council	Pre 1	Control
2008	Parliamentary	Post 1	Treatment
2010	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

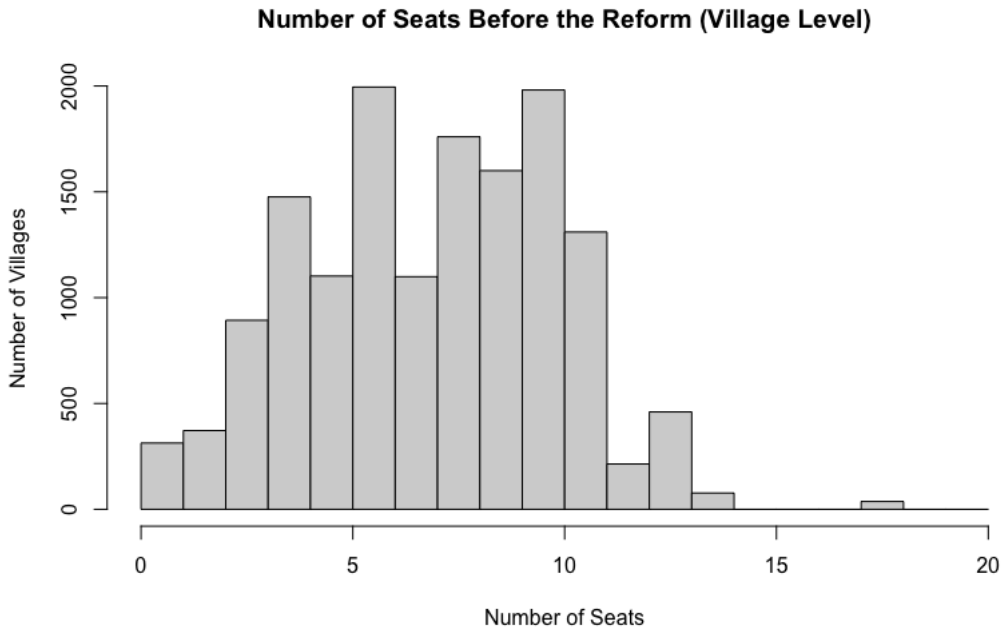

Figure A1: Number of Seats in Parliamentary and Local Elections Before the Reform

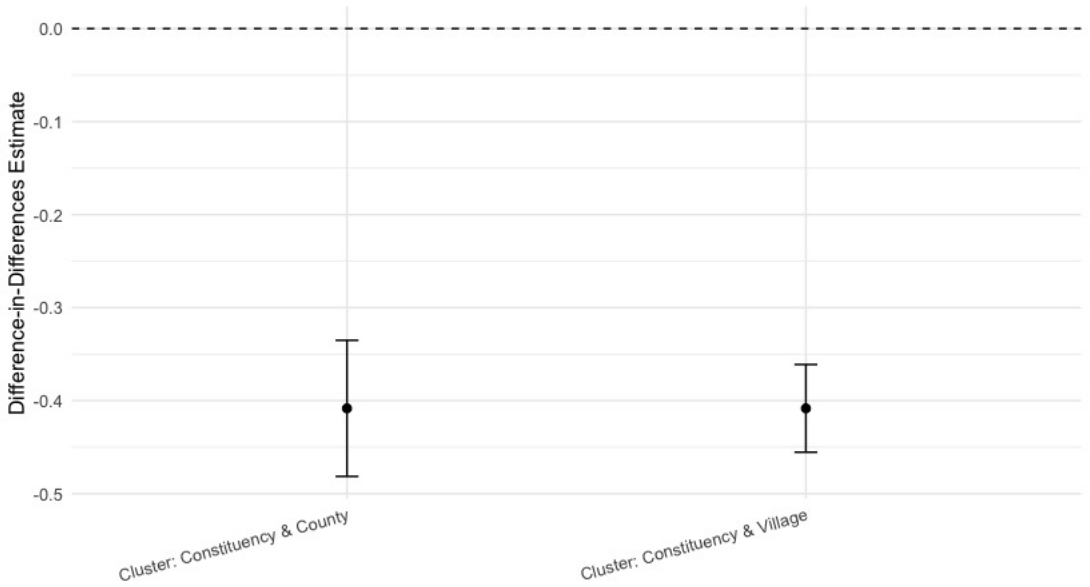

Figure A2: Main DiD Estimates with Two-Way Clustering

Table A2: Heterogeneous Effects by Pre-Reform Electoral Conditions

	Dependent Variable: SF Ratio	
	(1)	(2)
Treatment (Parliamentary)	0.026	0.014
	(0.025)	(0.033)
Difference in Difference	-0.512^{***}	-0.289^{***}
	(0.038)	(0.048)
Treatment × Pre-Reform Electoral Competitiveness	−0.021	
	(0.105)	
Post × Pre-Reform Electoral Competitiveness	0.121	
	(0.070)	
DiD × Pre-Reform Electoral Competitiveness	0.556^{***}	
	(0.132)	
Treatment × Pre-Reform Small-Party Presence		0.007
		(0.021)
Post × Pre-Reform Small-Party Presence		0.005
		(0.015)
DiD × 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

*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

	Dependent Variable: SF Ratio		
	(1) Full sample w/ Pre-Reform Controls	(2) TSU/PFP nomination	(3) All Small-party nomination
Treatment (Parliamentary)	0.021	−0.054	−0.027
	(0.016)	(0.069)	(0.025)
Difference in Difference	−0.408***	−0.309***	−0.345***
	(0.026)	(0.071)	(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

*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.

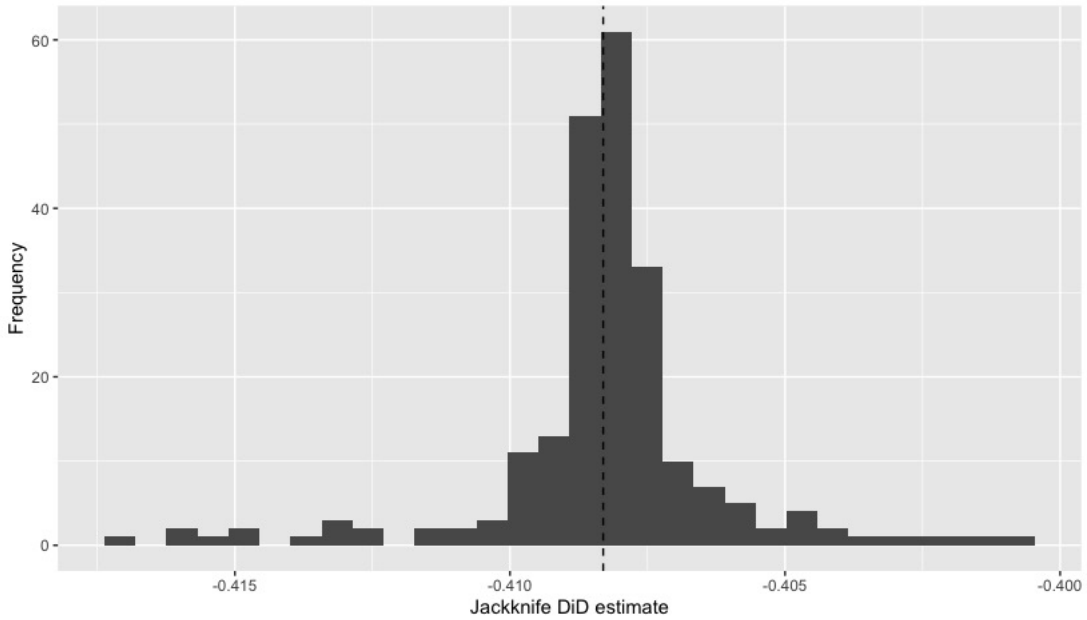

Figure A3: Dynamic Treatment Effects

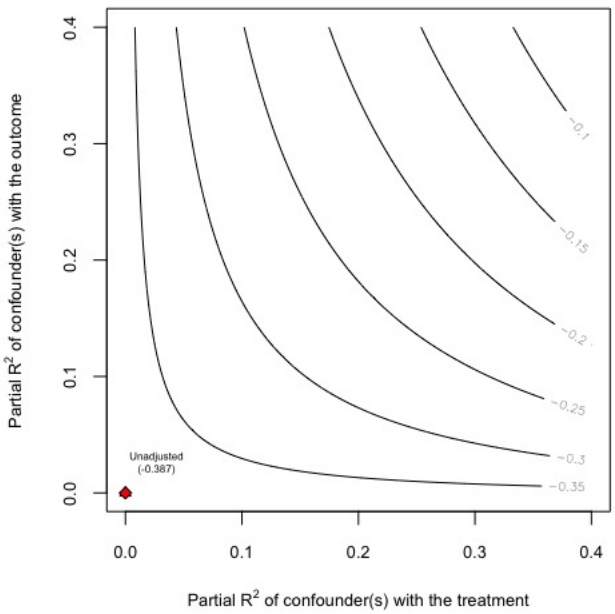

Figure A4: Sensitivity to Omitted Variable Bias: Benchmarking Against Pre-Reform Electoral Competitiveness

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.